INTERNATIONAL MARITIME ORGANIZATION

E

SUB-COMMITTEE ON CARRIAGE OF CARGOES AND CONTAINERS
4th session
Agenda item 6

CCC 4/6
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AMENDMENTS TO THE IMDG CODE AND SUPPLEMENTS

Report of the 27th session of the Editorial and Technical Group

Note by the Secretariat

SUMMARY

Executive summary:	This document contains the discussions and decisions taken by E&T 27 in the context of amendments to the International Maritime Dangerous Goods (IMDG) Code
Strategic direction:	5.2
High-level action:	5.2.3
Output:	5.2.3.4
Action to be taken:	Paragraph 5.1
Related documents:	CCC 3/6/1, CCC 3/6/3, CCC 3/6/4, CCC 3/6/5, CCC 3/6/6, CCC 3/6/7, CCC 3/6/8, CCC 3/6/10, CCC 3/INF.25 and CCC 3/15

1 GENERAL

Introduction

1.1 The twenty-seventh session of the Editorial and Technical Group of the Sub-Committee on Carriage of Cargoes and Containers met from 8 to 12 May 2017 under the chairmanship of Ms. Gudula Schwan (Germany).

1.2 The session was attended by delegations from the following Member States:

ANGOLA
BELGIUM
BRAZIL
CANADA
CHILE
CHINA
FINLAND
MALAYSIA
MARSHALL ISLANDS
NETHERLANDS
NIGERIA
NORWAY
PERU
REPUBLIC OF KOREA

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FRANCE	SPAIN
GERMANY	TURKEY
INDONESIA	UNITED ARAB EMIRATES
IRAN (ISLAMIC REPUBLIC OF)	UNITED KINGDOM
JAPAN	UNITED STATES

and observers from the following international organizations and non-governmental organizations in consultative status:

EUROPEAN CHEMICAL INDUSTRY COUNCIL (CEFIC)
DANGEROUS GOODS ADVISORY COUNCIL (DGAC)
WORLD NUCLEAR TRANSPORT INSTITUTE (WNTI)
INTERNATIONAL PAINT AND PRINTING INK COUNCIL (IPPIC)

Instructions to the E&T Group

1.3 The Sub-Committee (CCC 3) authorized E&T 27 to prepare the next set of draft amendments (39-18) to the IMDG Code, based on documents submitted to CCC 3 and taking into account comments made and decisions taken by the Sub-Committee at that session. E&T 27 should also take into consideration the outcome of the UN TDG Sub-Committee with regard to the amendments to the nineteenth revised edition of the UN Recommendations on the Transport of Dangerous Goods, Model Regulations. Furthermore, the Group should, at the next revision of the EmS Guide (if any), prepare a new draft revised MSC circular containing a consolidated version of the Guide for ease of reference, taking into account that a new consolidated MSC circular with a new number may result in consequential changes to references contained in the IMDG Code. The Group should also identify and correct any editorial mistakes in amendment 38-16 to the IMDG Code, adopted by resolution MSC.406(96), and submit a written report to CCC 4.

Adoption of the agenda

1.4 Noting that the provisional agenda contained in document E&T 27/1 was based on the instructions of CCC 3, the group adopted the agenda.

1.5 The list of participants is contained in document E&T 27/INF.1.

2 PREPARATION OF DRAFT EDITORIAL CORRECTIONS TO THE AMENDMENTS TO THE IMDG CODE (AMENDMENT 38-16)

Editorial corrections

2.1 Based on documents E&T 27/2 (Germany), E&T 27/2/2 (Republic of Korea) and E&T 27/INF.4 (Secretariat), the Group prepared draft editorial corrections to the IMDG Code (amendment 38-16), as set out in annex 1, and requested the Secretariat to refer these to the Sub-Committee for consideration.

2.2 The Group also considered document E&T 27/2/1 (United Kingdom), proposing two editorial corrections to the IMDG Code (amendment 38-16), i.e. the deletion of the assignment of special provision 29 to UN 2800 and amendments to tables 7.1.4.5.3.1 and 7.1.4.5.3.4.

2.3 Following the discussion, the Group noted that the existing wording of special provision (SP) 29 is different from SP 29 in the UN Model Regulations. The Group agreed that the existing SP 29 could be separated into two special provisions, i.e. SP 29 and SP 973, and that SP 973 is applicable to UN Nos 1327, 1363, 1364, 1365, 1374, 1386, 1856, 2216, 2217, 2698 and 3360.

The deletion of SP 29 for UN 2800 was generally supported by the group, as SP 29 was not assigned in the Model Regulations and an exemption beyond the existing SP 238 was not regarded as necessary. Furthermore, the Group noted that a consequential amendment to provision 5.2.2.1.2.1 may also be needed.

2.4 Having noted that the amendments were beyond the scope of editorial corrections, the Group agreed to prepare the above-mentioned amendments (amendments concerning UN 2800 were kept in square brackets) as part of the draft amendments 39-18 to the IMDG Code. The corresponding draft amendments, as agreed by the Group, are incorporated in the draft amendments (39-18), as set out in annex 2.

2.5 With regard to the amendments to tables 7.1.4.5.3.1 and 7.1.4.5.3.4, the Group noted that the tables 7.1.4.5.3.1 and 7.1.4.5.3.4 were not in line with the UN Model Regulations and SSR-6. However, the Group noted that the limitation to closed containers had been included in the IMDG Code intentionally, in order to avoid the application of the higher TI and CSI to flat racks as well. In this context, the Group noted that the application to flat racks had been considered as an unexpected consequence triggered by the deletion of "enclosed character" from the definition of a freight container in TSR-1. The Group further noted that the issue had been reviewed by IAEA, but a limitation of the TI and CSI values for closed containers had not been accepted. Following the discussion, the Group could not reach an agreement on harmonizing the IMDG Code in accordance with the UN Model Regulations and SSR-6. In this context, the Group agreed that the TI limits and CSI limits for the total vessel as indicated in 7.1.4.5.3 and 7.1.4.5.3.4, i.e. 200 or no limit, need to be further clarified, as the same TI and CSI values can apply to packages, irrespective of whether they are loaded in or on containers as a container does not provide additional protection.

2.6 Subsequently, the Group requested the Secretariat to bring this issue to IAEA's attention for its possible consideration at TRANSSC 34, in order to clarify the TI limits and CSI limits for the hold and the total vessel, with a view to harmonize the IMDG Code and SSR-6.

2.7 Following the discussion, the Group also noted document E&T 27/INF.5 (France), containing references and editorial corrections to the French version of the IMDG Code (amendment 38-16). In this context, the delegations of France and Spain informed the Group that a consolidated version of draft editorial corrections to the French and Spanish versions (respectively) of the IMDG Code will be prepared after E&T 27 to submit to CCC 4.

3 PREPARATION OF DRAFT AMENDMENT 39-18 TO THE IMDG CODE

Harmonization with the amendments to the UN Recommendations on the transport of dangerous goods, nineteenth revised edition

3.1 The Group considered document E&T 27/3 (Secretariat), containing the draft amendments to the IMDG Code, based on the outcome of the eighth session of the UN Committee of Experts on the Transport of Dangerous Goods and on the Globally Harmonized System of Classification and Labelling of Chemicals, which was held in Geneva on 9 December 2016.

3.2 For this purpose, the Report of the UN Committee of Experts (ST/SG/AC.10/44/Add.1) containing the amendments to the nineteenth revised edition to the UN Recommendations on the Transport of Dangerous Goods (Model Regulations and the Manual of Tests and Criteria) was also used. The outcome of main issues and actions taken thereon by the group are contained in the paragraphs hereunder.

Transport of articles containing dangerous goods N.O.S

3.3 Having considered the draft amendments to the UN Model Regulations on 2.0.6.2, the Group agreed to modify the text on lithium batteries in articles in accordance with SP 972. The corresponding draft amendments, as prepared by the Group, are incorporated in the draft amendments (39-18), as set out in annex 2.

Dangerous Goods List

3.4 With regard to the amendments to chapter 3.2 on the Dangerous Goods List, the Group agreed to add the relevant assignments for column (15) on the emergency schedules for FIRE and SPILLAGE, column (16a) on stowage and handling and column (17) on properties and observations for all new UN numbers. The corresponding draft amendments, as prepared by the Group, are incorporated in the draft amendments (39-18), as set out in annex 2.

3.5 In light of the new assignments for column (15) on the emergency schedules for FIRE and SPILLAGE, the Group agreed to carry out the consequential amendments to the Emergency response procedures for ships carrying dangerous goods (EmS Guide) accordingly (see paragraph 4.2).

Fish meal

3.6 The Group noted document E&T 27/INF.3 (Secretariat), providing background information on two documents submitted to the fiftieth session of UNSCETDG, in particular, proposing to amend the special provision 308 for FISHMEAL (FISHSCRAP), STABILISED (UN 2216): class 9.

3.7 Following the discussion, the Group noted the following views expressed on this matter:

.1 SP 308 should be specified for packages containing not more than 3,000 kg, while SP 945 should be specified for portable tanks and bulk containers containing more than 3,000 kg;

.2 for stabilizing fish meal, BHT is not used in powder form but in a solution;

.3 tocopherol-based antioxidant should be considered within the scope of SP 945. However, more data and analysis were needed at this stage;

.4 more consideration on the stabilization of consignments exceeding 3,000 kg may be needed; and

.5 after the finalization of amendments to SP 308 and SP 945 in the IMDG Code, the individual schedule for "FISHMEAL (FISHSCRAP), STABILIZED UN 2216 Anti-oxidant treated" in the IMSBC Code should be harmonized accordingly.

3.8 After the consideration, the Group agreed on the draft amendments to SP 308 by specifying that packages should contain no more than 3,000 kg, while for SP 945 the Group decided to hold the draft amendments between square brackets. In this context, the Group agreed to invite interested delegations to submit further proposals to CCC 4 on this matter.

Placarding and marking of cargo transport units and bulk containers

3.9 The Group considered the draft amendments to chapter 5.3 on the placarding and marking of cargo transport units with regard to bulk containers. The Group noted that a cargo transport unit could be a freight container (which could also be used as a bulk container), but could not cover the full range of bulk containers, i.e. flexible bulk containers. In this context, the Group agreed that chapter 5.3 should cover the full range of bulk containers and amended provisions 5.3.1.1.1 to 5.3.1.1.4 and 5.3.2 accordingly. The Group further agreed to insert a new sub-paragraph in 5.3.1.1.4.1, with a view to cover the placarding of flexible bulk containers.

Information required in addition to the dangerous goods description

3.10 During the consideration of amendments to 5.4.1.5.5 on the indication of self-reactive substances, organic peroxides and polymerizing substances, the Group noted that 5.4.1.5.4 and 5.4.1.5.5 could be further amended or merged. The Group also agreed to request the Secretariat to inform the UNSCETDG accordingly.

Restructuring of chapter 7.3.7

3.11 Having noted the different structure between the UN Model Regulations and the IMDG Code, the Group had a lengthy discussion on the draft amendments to section 7.3.7 on cargo transport units under temperature control. The Group agreed to insert new stowage provisions in 7.1.4.7 with a view to covering polymerizing substances, which are only identified by the word STABILIZED in their proper shipping name. The Group concluded that amendments with regard to ventilation requirements are not necessary, as the concerned substances are usually stowed on deck and if stowage under deck is allowed, ventilation is required by SOLAS and the applicable stowage codes. The Group also noted that the provisions on temperature control are widely mode specific, but 7.3.7 was amended on the basis of the amendments to the UN Model Regulations, as far as reasonable.

3.12 Following the discussion, the Group restructured chapter 7.3.7 by merging the amendments to the UN Model Regulations and the existing text of the IMDG Code. The corresponding draft amendments, as agreed by the Group, are incorporated in the draft amendments (39-18), as set out in annex 2.

Incorporation of proposals agreed in principle at CCC 3

3.13 The Group recalled that CCC 3 agreed in principle to proposals as contained in documents CCC 3/6/3 (Germany), CCC 3/6/6 (United States), CCC 3/6/7 (Germany) and CCC 3/6/10 (IPPIC), which consequently were referred to E&T 27 for consideration and inclusion in draft amendment 39-18. In this context, the Group noted that the Secretariat had prepared document E&T 27/3/1 and agreed to use the annexed corresponding draft amendments as a basis for incorporation.

3.14 In considering document CCC 3/6/10 (IPPIC), proposing to harmonize the package size limits which can cause certain viscous flammable liquids to be removed from packing group III, the Group agreed to the consequential amendments to 2.3.2.2, i.e. amending "30-litre" to "450-litre".

3.15 Having considered the draft amendments in the annexes to document E&T 27/3/1 (Secretariat), in conjunction with documents CCC 3/6/3, CCC 3/6/6, CCC 3/6/7 and CCC 3/6/10, the Group incorporated the corresponding draft amendments in annex 2.

Consideration of proposals referred to E&T 27 by CCC 3

Segregation of organic peroxides, class 5.2

3.16 The Group noted that document CCC 3/6/1 (CEFIC) contains amendments to the segregation requirements of organic peroxides, UN 3101 to UN 3120, exempting organic peroxides, and also proposing the inclusion of a new table in paragraph 7.2.6.3 of the IMDG Code, and that CCC 3 agreed that the proposal required in-depth consideration in order to fully explore its implications on certain situations.

3.17 The Group also noted document E&T 27/3/7 (CEFIC), providing additional background information, i.e. expert statements for co-loading competency and correspondence with BAM, regarding the proposals in document CCC 3/6/1 (CEFIC) on segregation requirements of organic peroxides.

3.18 Following the discussion, the Group noted the following views expressed on this matter:

.1 consideration 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;

.2 the entries for organic peroxides are generic in nature and there are numerous different combinations;

.3 co-loading of all organic peroxides (with or without subsidiary risk label) has been a common practice in the industry and there have been no reported incidents as these substances are of the same chemical family and mutually compatible;

.4 the proposed amendments should not impact on the existing exceptions as contained in tables 7.2.6.3.1 and 7.2.6.3.3; and

.5 the proposed amendments would require the assignment of SG72 to the listed entries.

3.19 After a lengthy discussion, the Group reached a compromise to include the draft new table together with an additional provision applicable to it, requiring 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.

3.20 The corresponding draft amendments, as agreed by the Group, are incorporated in the draft amendments (39-18), as set out in annex 2.

Stowage away from sources of ignition

3.21 The Group noted document CCC 3/6/4 (Germany), proposing to amend the wording of 7.4.2.3.2 of the IMDG Code, in order to clarify the requirement to stow a container with flammable liquids (flashpoint below 23°C) and flammable gases 2.4 m away from sources of ignition. Furthermore, CCC 3 agreed to refer document CCC 3/6/5 to E&T 27 for further consideration.

3.22 The Group, having recalled that the issue was possibly an omission due to the restructuring of chapter 7 from amendment 35-10 to the IMDG Code, agreed to modify the provisions of 7.4.2.3.2 by covering the aspect of a vertical projection of the required horizontal distance.

3.23 The corresponding draft amendments, as agreed by the Group, are incorporated in the draft amendments (39-18), as set out in annex 2.

Stowage of jet perforating guns

3.24 The Group noted document CCC 3/6/5 (United States), proposing to amend the existing stowage requirements for jet perforating guns, by amending the stowage of goods of class 1 requirements found in 7.1.4.4 together with a new stowage code. Notwithstanding that there were no objections to the proposal, CCC 3 agreed that further consideration at E&T 27 was required to address issues such as the possible hazards arising in icy conditions, the ship type, segregation from initiation devices and the total explosive content of 91 kg.

3.25 The Group also considered document E&T 27/3/10 (United States), containing a modified proposal for stowage requirements for jet perforating guns, taking into consideration the feedback received at CCC 3.

3.26 Following the discussion, the Group noted the following views expressed on this matter:

.1 the proposed amendments should not be limited to a specific type of ship (e.g. offshore supply vessels), but to transports for offshore supply;

.2 it is more appropriate to insert the proposed amendments directly under stowage of goods of class 1; and

.3 additional requirements on the protection of the ends of jet perforating guns should be included.

3.27 In the ensuing discussion, the Group agreed that the amendments should be provisions on the transport to or from offshore oil platforms, mobile offshore drilling units and other offshore installations and that the new text should be incorporated in 7.1.4.4.5. The corresponding draft amendments, as agreed by the Group, are incorporated in the draft amendments (39-18), as set out in annex 2.

Segregation provisions for ammonium bromate

3.28 The Group noted document CCC 3/6/8 (Germany), proposing to clarify that ammonium bromate is prohibited for transport and therefore no segregation provision applies and to clarify the application of SP 352 and SP 900 to UN 1908 and UN 1791. CCC 3, having noted the view that the proposal relating to UN 1908 should be eventually submitted to UNSCETDG as it would affect other transport modes, agreed to refer document CCC 3/6/8 to E&T 27 for further consideration.

3.29 After a general discussion, the Group agreed to delete the entry "UN 3213 Ammonium Bromate" from segregation group 3 in subsection 3.1.4.4. Furthermore, the Group noted that if a pure substance was prohibited, usually the transport of the solution is also prohibited and agreed to include the assignment of SP 274 to both UN 1791 and UN 1908, and the assignments of SP 352 to UN 1908 and SP 900 to UN 1791 in square brackets.

3.30 The corresponding draft amendments, as agreed by the Group, are incorporated in the draft amendments (39-18), as set out in annex 2.

Battery-vehicles

3.31 Having recalled the decision of CCC 3 (paragraph 6.36) to refer document CCC 3/INF.25 (CEFIC) to E&T 27 with the aim of exchanging views and sharing information on this matter, if time permits, the Group noted document E&T 27/3/7 (CEFIC) providing draft amendments to the requirements for the transport of battery-vehicles for compressed gases on short international voyages in the IMDG Code. The draft amendments, which cover chapters 1.2, 4.2, 6.7 and 6.8, are also provided.

3.32 Following the discussion, the Group supported the proposal in principle. The Group noted that the use of battery-vehicles for compressed gases are mainly limited to short international voyages and recommended to use chapter 6.8 for new provisions. Some delegations expressed the view that specific provisions on multiple-element gas containers (MEGCs) may be appropriate to address the tubes mounted on such vehicles and that the vehicles should be equipped to be secured on ro-ro ships. In addition, some delegations expressed the view that more consideration should be given to the name of "battery-vehicles" as it could be misleading, while others considered that the name "battery-vehicles" is appropriate.

3.33 Subsequently, the Group invited interested delegations to work together with CEFIC, with a view to submitting a proposal to CCC 4.

Draft amendment 39-18 (part 1)

3.34 Subsequently, the Group prepared draft amendment 39-18 (part 1) to the IMDG Code, based on the harmonization with the UN Model Regulations, proposals agreed in principle by CCC 3 and proposals referred by CCC 3 to E&T 27 for further consideration, as set out in annex 2. With regard to the draft amendments held between square brackets, the Group agreed that those are to be finalized by CCC 4 or E&T 28, as appropriate. In this context, the Group highlighted all amendments related to UN Model Regulations and requested the Secretariat to inform the UN TDG Sub-Committee to take action as appropriate.

Consideration of new proposals submitted to E&T 27

Packing, stowage and handling provisions of UN 2555 and UN 2556

3.35 The Group considered document E&T 27/3/2 (China), proposing amendments to the packing, stowage and handling provisions of NITROCELLULOSE WITH WATER (UN 2555) and NITROCELLULOSE WITH ALCOHOL (UN 2556).

3.36 Some delegations expressed their gratitude to the Chinese delegation for sharing lessons learnt from the tragedy of the Tianjin Port explosion. However, the Group noted that the proposed new special provisions on packaging of NITROCELLULOSE WITH WATER (UN 2555) and NITROCELLULOSE WITH ALCOHOL (UN 2556) were a multimodal transport issues and the related discussion had already been initiated in the UNSCEDTG.

3.37 The Group noted that the applicable packing instruction already requires prevention of loss of phlegmatizer content. Furthermore, the Group noted that the transport of substances not sufficiently stabilized is prohibited and that the wetting of nitrocellulose is not a stabilization method. In this context, the Group recommended the Chinese delegation to submit proposals to UNSCETDG to further progress this issue.

3.38 With regard to including Stowage Code "SW1" and Handling Code "H2" in column (16a) of entries UN 2555 and UN 2556, the Group agreed to the inclusion, and the corresponding draft amendments to the IMDG Code are incorporated in annex 3.

Amendments to special provision 965 under the entries for UN 2211 and UN 3314

3.39 The Group considered document E&T 27/3/3 (China), proposing amendments to SP 965, which was assigned to UN 2211 and UN 3314. The Group also noted that document E&T 27/INF.2 (China) contains two test reports, providing information on the properties of permeability resistance and leakproofness of flexible packagings and IBCs. Several experts expressed concern that the proposed new packagings are not capable of retaining the pentane within the packaging in order to prevent an explosive atmosphere in the container. After a general discussion, the Group could not support the proposal.

Amendments to 5.4.1.4.1 and/or special provisions 376 and 377

3.40 The Group considered document E&T 27/3/5 (France), proposing draft amendments to 5.4.1.4.1 and/or SPs 376 and 377 of the IMDG Code, with regard to the transport of LITHIUM ION BATTERIES (UN 3480). In this context, the Group noted that two options are provided, i.e. to modify SP 376 and SP 377; or to revise paragraph 5.4.1.4.1 of the IMDG Code, related to the dangerous goods description and the transport document. Additionally, consequential amendments would be needed.

3.41 After a general discussion, the Group noted that the proposed amendment of SP 376 was already covered by the harmonization with the UN Model Regulations and agreed to introduce the sentence "The transport document shall include the following statement: 'Transport in accordance with special provision 377'" in SP 377. In this context, the Group noted that the statements in the transport document will usually not be transferred to the dangerous goods manifest and further consideration of hazard communication regarding damaged batteries may be needed.

3.42 The corresponding draft amendments to the IMDG Code, as agreed by the Group, are set out in annex 3.

Amendments to 5.4.5.1 of the IMDG Code and consequential amendments

3.43 The Group considered document E&T 27/3/6 (France), proposing amendments to the IMDG Code with regard to the introductory text of the Multimodal Dangerous Goods Form and consequential amendments to paragraphs 3.4.6.1 and 3.5.6.1.

3.44 Having noted that the proposed amendments will not conflict with SOLAS chapter VII, regulation 4 and MARPOL, Annex III, regulation 4, the Group agreed to modify the text under 5.4.5.1 and to delete the introductory text under the heading of the existing form. Subsequently, consequential amendments in paragraphs 3.4.6.1 and 3.5.6.1 to replace the expression "dangerous goods declaration" with "dangerous goods transport document" were also agreed by the Group.

3.45 The corresponding draft amendments to the IMDG Code, as agreed by the Group, are set out in annex 3.

Special provision 117

3.46 The Group considered document E&T 27/3/8 (Spain), proposing the deletion of SP 117 for UN 2217. Document E&T 27/3/8 states that the European agreements ADR and RID contain provisions regarding UN 2217; therefore, the assignment of SP 117 to UN 2217 is not correct and may lead users of the IMDG Code to ignore that for the other modes of transport (road and rail), prescriptions are also applicable and may even lead to non-compliance with the safety measures prescribed in the other regulations.

3.47 After a general discussion, the Group agreed to the deletion of SP 117 for the entry of UN 2217. The corresponding draft amendments to the IMDG Code, as agreed by the Group, are set out in annex 3.

3.48 The Group also considered document E&T 27/3/9 (Spain), proposing to reword SP 117 in the Spanish language version of the IMDG Code as "Only regulated when transported by sea".

3.49 Following the discussion, the Group agreed to reword SP 117 in the Spanish version of the IMDG Code as follows:

> "DE 117 'El transporte de esta sustancia solo está regulado cuando se transporta por mar.'"

3.50 Subsequently, the Group agreed that the above-mentioned rewording should be consolidated into the editorial corrections to the Spanish version of the IMDG Code (amendment 38-16) (see paragraph 2.7).

Identification of Marine Pollutants

3.51 The Group considered document E&T 27/3/9 (United States), proposing to update the index of the IMDG Code to indicate that 1-dodecene is not a marine pollutant, by taking into consideration the updated GESAMP hazard profile for 1-dodecene.

3.52 The proposed amendments were supported by the Group. With a view to excluding 1-dodecene as a marine pollutant from UN 2850, the Group agreed to amend UN 2850 in the Dangerous Goods List by adding "1-dodecene is not a marine pollutant." in column (17) and to amend the index accordingly.

3.53 The corresponding draft amendments to the IMDG Code, as agreed by the Group, are set out in annex 3.

Draft amendment 39-18 (part 2)

3.54 Subsequently, the Group prepared draft amendment 39-18 (part 2) to the IMDG Code, highlighting proposals directly submitted to E&T 27, as set out in annex 3.

4 PREPARATION OF DRAFT AMENDMENTS TO IMDG CODE SUPPLEMENT

Consolidated EmS Guide

4.1 The Group considered document E&T 27/4 (Secretariat), providing the draft consolidated version of the Emergency response procedures for ships carrying dangerous goods (EmS Guide) together with the related draft MSC circular, which was based on MSC/Circ.1025, MSC.1/Circ.1025/Add.1, MSC.1/Circ.1262, MSC.1/Circ.1360, MSC.1/Circ.1438, MSC.1/Circ.1476 and MSC.1/Circ.1522.

4.2 Having taken into account the consequential amendments (see paragraph 3.5) to the index Emergency response procedures for ships carrying dangerous goods (EmS Guide), the Group noted that the text of the schedules for spillage should be amended with regard to the new entries for articles. After further discussion, the Group agreed to incorporate new text under special cases in the concerned schedules. In this context, the Group noted that a further review of the EmS Guide might be necessary, in particular on combination packagings, as the substance may spill from the packaging or the inner packaging may spill from the outer packaging.

4.3 Subsequently, the Group prepared the draft Revised Emergency Response Procedures for Ships Carrying Dangerous Goods (EmS) Guide, also taking account of some editorial corrections, as set out in annex 4.

5 ACTION REQUESTED OF THE SUB-COMMITTEE

5.1 The Sub-Committee is invited to approve the report in general and, in particular, to:

.1 agree, in principle, to the draft editorial corrections to amendment 38-16 to the IMDG Code (paragraphs 2.1 to 2.7 and annex 1);

.2 note that the Group requested the Secretariat to draw IAEA's attention to the TI limits and CSI limits for the hold and the total vessel, with a view to harmonizing the IMDG Code and SSR-6 (paragraph 2.6);

.3 agree, in principle, to draft amendment 39-18 to the IMDG Code (part 1), taking into account that some amendments are held between square brackets to be finalized by CCC 4 or E&T 28, as appropriate (paragraphs 3.1 to 3.34 and annex 2);

.4 note that the Group requested the Secretariat to invite the UN TDG Sub-Committee to consider relevant amendments to the IMDG Code, as highlighted in annexes 1 and 2 (paragraph 3.34);

.5 agree, in principle, to draft amendment 39-18 to the IMDG Code (part 2), containing proposals submitted directly to E&T 27 (paragraphs 3.35 to 3.54 and annex 3); and

.6 agree, in principle, to the draft consolidated Revised Emergency Response Procedures for Ships Carrying Dangerous Goods (EmS) Guide (paragraph 4.3 and annex 4).

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ANNEX 1

DRAFT EDITORIAL CORRECTIONS TO THE ENGLISH VERSION OF THE IMDG CODE AMENDMENT 38-16 ADOPTED BY RESOLUTION MSC.406(96)

Note: The highlighted (light blue) text is related to UN Model Regulations.

PART 1
GENERAL PROVISIONS, DEFINITIONS AND TRAINING

Chapter 1.2
Definitions, units of measurement and abbreviations

1.2.1 Definitions

In the definition of *Self-accelerating decomposition temperature (SADT),* replace the second sentence with "The self-accelerating decomposition temperature (SADT) shall be determined in accordance with Part II of the Manual of Tests and Criteria."

PART 2
CLASSIFICATION

Chapter 2.3
Class 3 – Flammable liquids

2.3.2 Assignment of packing group

2.3.2.2.1 In the first column of the table, in the last line, replace "700 < t" with "700 < v".

Chapter 2.7
Class 7 – Radioactive material

2.7.2.4.1.2 In table 2.7.2.4.1.2, replace "Item limitsa" with "Item limits[a]", "Package limitsa" with "Package limits[a]" and also replace "Material package limitsa" with "Material package limits[a]".

PART 3
DANGEROUS GOODS LIST, SPECIAL PROVISIONS AND EXCEPTIONS

Chapter 3.2
Dangerous goods list

In the dangerous goods list, amend the following entries as follows:

"

1333	In column (2), replace "CERIUM slabs, ingots or rods" with "CERIUM, slabs, ingots or rods"
1396 PG III	In column (9), delete "PP40"
1398 PG III	In column (9), delete "PP40"

1402 PG I	In column (9), delete "PP40"
1403 PG III	In column (9), delete "PP40"
1405 PG III	In column (9), delete "PP40"
1418 PG II	In column (15), replace "F-G" with "F-G"
1418 PG III	In column (15), replace "F-G" with "F-G"
1712	In column (2), replace "ZINC ARSENATE or ZINC ARSENITE or ZINC ARSENATE, ZINC ARSENITE MIXTURE" with "ZINC ARSENATE or ZINC ARSENITE or ZINC ARSENATE AND ZINC ARSENITE MIXTURE"
2383	In column (16a), insert "SW1"
2441	In column (9), insert "PP31"
2465	In column (2), replace "or DICHLOROISOCYANURIC ACID, SALTS" with "or DICHLOROISOCYANURIC ACID SALTS"
2870 First entry	In column (15), replace "F-G" with "F-G"
3132 PG III	In column (9), delete "PP 40"
3208 PG III	In column (9), delete "PP 40"
3482 PG I	In column (15), replace "F-G" with "F-G"
3530	In column (17), delete the words "or fuel cells"
3391 PG I	In column (16b), add "SG72"
3392 PG I	In column (16b), add "SG72"
3393 PG I	In column (16b), add "SG72"
3394 PG I	In column (16b), add "SG72"
3395 PG I	In column (16b), add "SG72"
3395 PG II	In column (16b), add "SG72"
3395 PG III	In column (16b), add "SG72"
3396 PG I	In column (16b), add "SG72"
3396 PG II	In column (16b), add "SG72"
3396 PG III	In column (16b), add "SG72"
3397 PG I	In column (16b), add "SG72"
3397 PG II	In column (16b), add "SG72"

3397 PG III	In column (16b), add "SG72"
3398 PG I	In column (16b), add "SG72"
3398 PG II	In column (16b), add "SG72"
3398 PG III	In column (16b), add "SG72"
3399 PG I	In column (16b), add "SG72"
3399 PG II	In column (16b), add "SG72"
3399 PG III	In column (16b), add "SG72"
3400 PG II	In column (16b), add "SG72"
3399 PG III	In column (16b), add "SG72"

"

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

Amend the following special provisions:

SP 207 Replace "Moulding compounds" with "Plastics moulding compounds".

SP 225 In the second paragraph, delete the second sentence. Add a new third paragraph as follows:

"Fire extinguishers under this entry include:

.1 portable fire extinguishers for manual handling and operation;

.2 fire extinguishers for installation in aircraft;

.3 fire extinguishers mounted on wheels for manual handling;

.4 fire extinguishing equipment or machinery mounted on wheels or wheeled platforms or units transported similar to (small) trailers; and

.5 fire extinguishers composed of a non-rollable pressure drum and equipment, and handled, e.g. by fork lift or crane when loaded or unloaded."

SP 369 In the first paragraph, replace "with radioactive material" by "with radioactivity".

SP 384 At the end, before the note, insert "However, for placarding of cargo transport units, the placard shall correspond to Model No.9."

Chapter 3.4
Dangerous goods packed in limited quantities

3.4.1.2.5 Replace "5.1.1.4" with "5.1.1.6" (see also amendments to chapter 5.1.1 below).

3.4.5 Marking and placarding

3.4.5.5.4 Replace "The marking shall" with "The mark shall".

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)

P002 In special packing provision PP11, replace "UN Nos. 1361 and 1362, 5M1 bags" with "and UN 1362, 5H1, 5L1 and 5M1 bags".

P200 In paragraph (2)(a), replace the words "name and description" with the words "proper shipping name".

P200 In paragraph (3)(a) replace the reference to "(4)" with "(5)", to read as follows:

"(a) For compressed gases, the working pressure shall be not more than two thirds of the test pressure of the pressure receptacles. Restrictions to this upper limit on working pressure are imposed by special packing provision "o" in (5) below. In no case shall the internal pressure at 65°C exceed the test pressure.".

In paragraph (3)(b) and (b)(i) replace the reference to "(4)" with "(5)", to read as follows:

"(b) For high pressure liquefied gases, the filling ratio shall be such that the settled pressure at 65°C does not exceed the test pressure of the pressure receptacles.

The use of test pressure and filling ratios other than those in the table is permitted, except where (5), special packing provision "o" applies, provided that:

(i) the criterion of (5), special packing provision "r" is met when applicable; or".

In paragraph (3)(d) replace the reference to "(4)" with "(5)" to read as follows:

"(d) For UN 1001, acetylene, dissolved, and UN 3374 acetylene, solvent free, see (5), special packing provision "p".".

P403 In special packing provision PP31, after 2813, delete "(PG I)".
P410 In special packing provision PP40, delete "1398," and "1403,".

PART 5
CONSIGNMENT PROCEDURES

Chapter 5.1
General provisions

5.1.1 Application and general provisions

Renumber the current paragraphs 5.1.1.3.1, 5.1.1.3.2, 5.1.1.3.3 and 5.1.1.4 as the new paragraphs 5.1.1.3, 5.1.1.4, 5.1.1.5 and 5.1.1.6.

5.1.2 Use of overpacks and unit loads

5.1.2.1 Replace the word "markings" with the word "marks" twice and replace the word "marking" with the word "mark".

Chapter 5.2
Marking and labelling of packages including IBCs

In the second sentence of the note below the heading of chapter 5.2, replace the word "markings" with the word "marks".

5.2.1.10 Lithium battery mark

5.2.1.10.2 In the last paragraph, after "black on white", insert "or suitable contrasting background".

5.2.2.2 Provisions for labels

5.2.2.2.1.3 In the second sentence, after the existing text, add the following:

> "However, for label model No.9A, the upper half of the label shall only contain the seven vertical stripes of the symbol and the lower half shall contain the group of batteries of the symbol and the class number. Except for label model No.9A, the label may include such text as the UN number, or words describing the hazard class (e.g. "flammable") in accordance with 5.2.2.2.1.5 provided that the text does not obscure or detract from the other required label elements."

Chapter 5.3
Placarding and marking of cargo transport units

5.3.2 Marking of cargo transport units

5.3.2.2 Elevated temperature substances

5.3.2.0.2 In the first sentence, replace the words "not more than 65 mm" with the words "not less than 65 mm". In the second sentence, replace the words "capacity of less than" with the words "capacity of not more than".

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)

6.1.2 Code for designating types of packagings

6.1.2.7 In the table, the two cells in column "paragraph" for section "B Aluminium" of "1 Drums" should be merged.

6.1.3 Marking

6.1.3.7 Replace the word "markings" with the word "marks".

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

6.2.1.5 Initial inspection and test

6.2.1.5.2 In the second paragraph, replace "in 6.2.1.5.1, .7, .8, and .9," with "in 6.2.1.5.1.7, .8, and .9,".

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 Under (f) replace ";" with "and". Under (g) at the end, replace ";" with "." and delete "(h) each element of the marking applied in accordance with subparagraphs (a) to (g)."

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

6.4.23 Applications for approval and approvals for radioactive material transport

6.4.23.12 (a) In the fourth line of the paragraph, replace "identification marking" with "identification mark".

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

6.5.2.1 Primary marking

6.5.2.1.2 Delete the following last sentence: "Each element of the marking applied in accordance with subparagraphs .1 to .8 and with 6.5.2.2 shall be clearly separated, such as by a slash or space, so as to be easily identifiable.".

6.5.5.5 Specific provisions for fibreboard IBCs

6.5.5.5.3 Replace the words "The fluting or corrugated fibreboard" with the words "The fluting of corrugated fibreboard".

6.5.5.6 Specific provisions for wooden IBCs

6.5.5.6.4 Replace the paragraph with the following:

> "Natural wood shall be well seasoned, commercially dry and free from defects that would materially lessen the strength of any part of the IBC. Each part of the IBC shall consist of one piece or be equivalent thereto. Parts are considered equivalent to one piece, when:
>
> > a suitable method of glued assembly, as for instance Lindermann joint, tongue and groove joint, ship lap or rabbet joint is used; or
> >
> > a butt joint with at least two corrugated metal fasteners at each joint is used; or
> >
> > other methods at least equally effective are used."

Chapter 6.6
Provisions for the construction and testing of large packagings

6.6.5 Test provisions for large packagings

6.6.5.1 Performance and frequency of test

6.6.5.1.9 Large salvage packagings

6.6.5.1.9 (b) Replace "required by 6.6.5.4." with "required by 6.6.5.4; and".

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

6.7.2.1 Definitions

6.7.2.1.2.3 In the definitions of *Design pressure*, replace ", but not less than 0.35 bar." with ", but not less than 0.35 bar; or".

PART 7
PROVISIONS CONCERNING TRANSPORT OPERATIONS

Chapter 7.2
General segregation provisions

7.2.8 Segregation codes

In the entry for SG72, replace "See 7.2.6.3.2." by "See tables in 7.2.6.3.".

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

7.3.7 Cargo transport units under temperature control

7.3.7.2.1 In the table, in column SADT, delete the symbol cross and the corresponding footnote.

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

7.8.6 Special fire precautions for class 1

Renumber the current paragraphs 7.8.6.1.1, 7.8.6.1.2 and 7.8.6.1.3 as the new paragraphs 7.8.6.1, 7.8.6.2 and 7.8.6.3.

7.8.7 Special fire precautions for class 2

Renumber the current paragraphs 7.8.7.3.1 and 7.8.7.3.2 as the new paragraphs 7.8.7.3 and 7.8.7.4.

APPENDICES

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

In the table for "Class 4.1", move the following entries for polymerizing substances from generic entries to specific entries:

"4.1	3531	POLYMERIZING SUBSTANCE, SOLID, STABILIZED, N.O.S.
4.1	3532	POLYMERIZING SUBSTANCE, LIQUID, STABILIZED, N.O.S.
4.1	3533	POLYMERIZING SUBSTANCE, SOLID, TEMPERATURE CONTROLLED, N.O.S.
4.1	3534	POLYMERIZING SUBSTANCE, LIQUID, TEMPERATURE CONTROLLED, N.O.S."

INDEX

Alphabetical Index

Amend the following entries as indicated hereunder:

In the entry for "Arsenates, liquid, N.O.S., inorganic, *see*", replace "N.O.S." with "n.o.s.".

In the entry for "Arsenates, solid, N.O.S., inorganic, *see*", replace "N.O.S." with "n.o.s.".

In the entry for "Arsenic sulphides, liquid, N.O.S., inorganic, *see*", replace "N.O.S." with "n.o.s.".

In the entry for "Arsenic sulphides, solid, N.O.S., inorganic, *see*", replace "N.O.S." with "n.o.s.".

In the entry for "Arsenites, liquid, N.O.S., inorganic, *see*", replace "N.O.S." with "n.o.s.".

In the entry for "Arsenites, solid, N.O.S., inorganic, *see*", replace "N.O.S." with "n.o.s.".

In the entry for "DICHLOROISOCYANURIC ACID, SALTS", replace "DICHLOROISOCYANURIC ACID, SALTS" with "DICHLOROISOCYANURIC ACID SALTS".

***

ANNEX 2

DRAFT AMENDMENTS (39-18) TO THE IMDG CODE (PART 1)

Note: This document contains only the relevant amendments (39-18) to the IMDG Code, except draft amendments obtained by the proposals directly submitted to E&T 27. The highlighted (light blue) text is related to UN Model Regulations. The text in square brackets requires further attention and consideration.

Table of Contents

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

Amend the contents for chapter 2.8 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: step-wise approach
2.8.5 Substances not accepted for transport"

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

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

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

Chapter 1.2
Definitions, units of measurement and abbreviations

1.2.1 Definitions

Amend the following definitions as indicated:

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

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

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

Chapter 1.4
Security provisions

1.4.3 Provisions for high consequence dangerous goods

1.4.3.1.5 Replace "subsidiary risks" by "subsidiary hazards".

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" by "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)" by "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)" by "subsidiary hazard(s)".

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

2.0.2 UN numbers and proper shipping names

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

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

2.0.2.10 Replace "subsidiary risk(s)" by "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 the following new paragraph 2.0.4.3:

"**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 the following new paragraph 2.0.6:

"**2.0.6 Transport of 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, sub-section 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 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" by "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, for compatibility group L, replace "risk" by "hazard".

2.1.3 Classification procedure

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

2.1.3.5 Assignment of fireworks to hazard divisions

2.1.3.5.1.1 Replace "giving a positive result when tested in one of the HSL Flash composition tests in appendix 7 of the Manual of Tests and Criteria" by "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 m 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" by "hazard".

2.2.3 Mixtures of gases

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

Chapter 2.3
Class 3 – Flammable liquids

2.3.2 Assignment of packing group

2.3.2.1 Replace "risk" by "hazard".

2.3.2.1.1 Replace "risk" by "hazard".

2.3.2.1.2 Replace "risk(s)" by "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 notes, replace "additional subsidiary risk" by "additional subsidiary hazard".

2.4.2.3.2 *Classification of self-reactive substances*

2.4.2.3.2.2 In the second sentence, replace "subsidiary risks" by "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."

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)

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

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

2.4.2.5 Class 4.1 – Polymerizing substances and mixtures (stabilized)

2.4.2.5.2 Add the following 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 exiting note as note 1, and add the 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" by "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" by "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" by "hazard".

2.5.3.3 Principles for classification of organic peroxides

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

2.5.3.3.2.3 Replace "risk" by "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" by "hazard" three times.

2.6.2.4 Classification of pesticides

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

2.6.2.4.3 Replace "risks" by "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," by "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 chapter 2.8 to read as follows:

"**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;

.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 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 three 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 three 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

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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.*

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 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

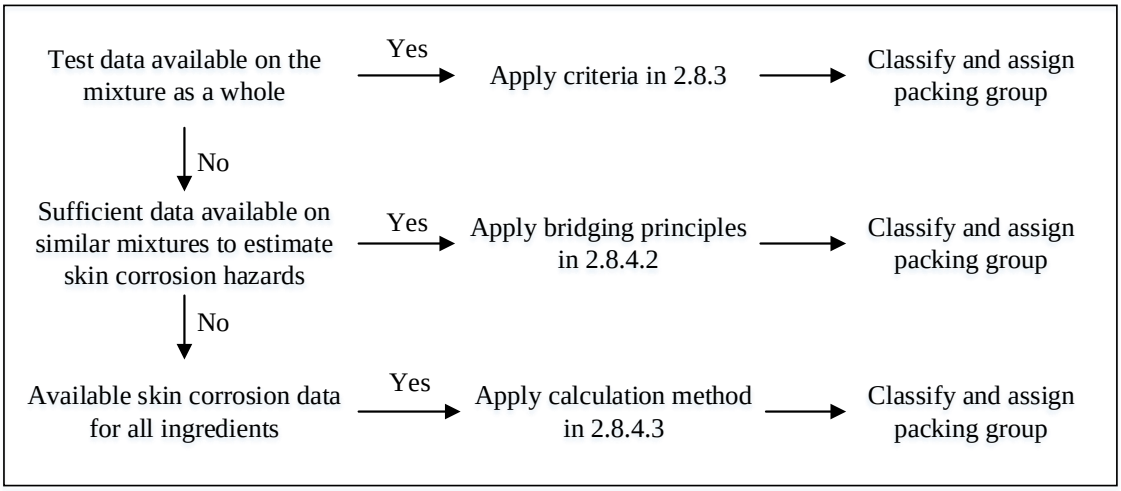
Packing Group	Exposure Time	Observation Period	Effect
I	≤ 3 min	≤ 60 min	Irreversible damage of intact skin
II	> 3 min ≤ 1 h	≤ 14 d	Irreversible damage of intact skin
III	> 1 h ≤ 4 h	≤ 14 d	Irreversible damage of intact skin
III	-	-	Corrosion rate on either steel or aluminium surfaces exceeding 6.25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

2.8.4 Alternative packing group assignment methods for mixtures: step-wise 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: Step-wise 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:

PG x_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 ≥ 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: $\frac{5}{5\ (GCL)} = 1$ ➔ *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: $\frac{3\ (conc\ A)}{30\ (SCL\ PGI)} + \frac{2\ (conc\ B)}{20\ (SCL\ PGI)} = 0{,}2 < 1$

The criterion for packing group I is not fulfilled.

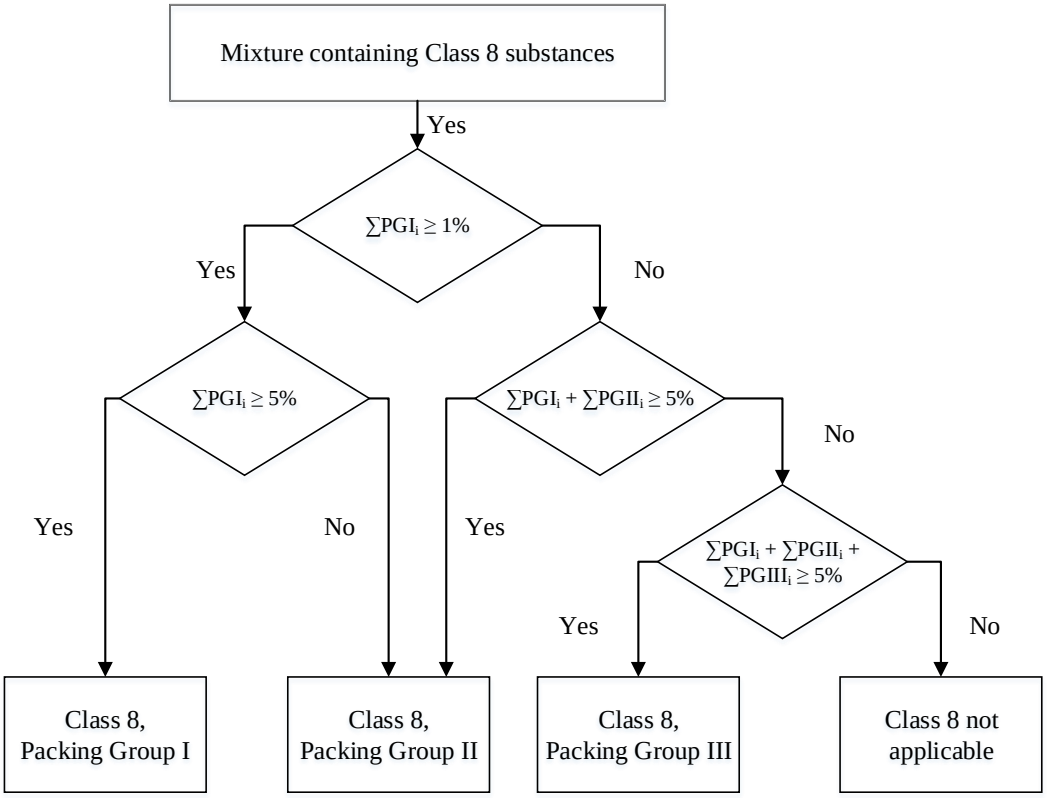
Calculation for packing group II: $\frac{3\ (conc\ A)}{5\ (GCL\ PG\ II)} + \frac{2\ (conc\ B)}{10\ (SCL\ PG\ II)} = 0{,}8 < 1$

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 "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 FERTILIZERS

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 "Other substances or articles presenting a danger during transport, but not meeting the definitions of another class", delete entry "2071 AMMONIUM NITRATE BASED FERTILIZERS" 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 Mixtures classification categories and criteria

2.9.3.4.6 Summation method

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 "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;

.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, sub-section 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, sub-section 38.3, paragraph 38.3.5."

Chapter 3.1
General

3.1.1 Scope and general provisions

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

3.1.2 Proper shipping names

3.1.2.2 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 the following new sub-paragraph .2:

> ".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 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."

In the second sentence, replace "risk" by "hazard" twice.

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

> "UN 3540 ARTICLES CONTAINING FLAMMABLE LIQUIDS N.O.S. (pyrrolidine)".

3.1.3 Mixtures or solutions

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

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

3.1.4 Segregation groups

3.1.4.4 Under "3 Bromates", delete the entry "3213 Ammonium bromate".

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)" by "subsidiary hazard(s)" twice.

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

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"
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"
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"
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"
1011	in column (6), insert "392"
1032	in column (16b), insert "SG35"
1036	in column (16b), insert "SG35"
1049	in column (6), insert "392"
1052	in column (16b), insert "SG36" and "SG49"
1061	in column (16b), insert "SG35"
1075	in column (6), insert "392"
1083	in column (16b), insert "SG35"
1106 PG II	in column (16b), insert "SG35"
1106 PG III	in column (16b), insert "SG35"
1125	in column (16b), insert "SG35"
1154	in column (16b), insert "SG35"
1158	in column (16b), insert "SG35"
1182	in column (16b), insert "SG36" and "SG49"
1183	in column (16b), insert "SG36" and "SG49"
1214	in column (16b), insert "SG35"
1221	in column (16b), insert "SG35"
1238	in column (16b), insert "SG36" and "SG49"
1242	in column (16b), insert "SG36" and "SG49"
1250	in column (16b), insert "SG36" and "SG49"
1277	in column (16b), insert "SG35"
1295	in column (16b), insert "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 "SG36" and "SG49"
1305	in column (16b), insert "SG36" and "SG49"
1325	in column (16b), insert "SG72"
1327	in column (6), insert "973"
1363	in column (6), insert "973"
1364	in column (6), insert "973"
1365	in column (6), insert "973"
1386 (both entries)	in column (6), insert "973"
1572	in column (16b), insert "SG36" and "SG49"
1595	in column (16b), insert "SG36" and "SG49"
1715	in column (16b), insert "SG36" and "SG49"
1716	in column (16b), insert "SG36" and "SG49"
1717	in column (16b), insert "SG36" and "SG49"
1718	in column (16b), insert "SG36" and "SG49"
1722	in column (16b), insert "SG36" and "SG49"
1723	in column (16b), insert "SG36" and "SG49"
1724	in column (16b), insert "SG36" and "SG49"

1725	in column (16b), insert "SG36" and "SG49"
1726	in column (16b), insert "SG36" and "SG49"
1727	in column (16b), insert "SG36" and "SG49"
1728	in column (16b), insert "SG36" and "SG49"
1729	in column (16b), insert "SG36" and "SG49"
1730	in column (16b), insert "SG36" and "SG49"
1731 PG II	in column (16b), insert "SG36" and "SG49"
1731 PG III	in column (16b), insert "SG36" and "SG49"
1732	in column (16b), insert "SG36" and "SG49"
1733	in column (16b), insert "SG36" and "SG49"
1736	in column (16b), insert "SG36" and "SG49"
1737	in column (16b), insert "SG36" and "SG49"
1738	in column (16b), insert "SG36" and "SG49"
1739	in column (16b), insert "SG36" and "SG49"
1740 PG II	in column (16b), insert "SG36" and "SG49"
1740 PG III	in column (16b), insert "SG36" and "SG49"
1742	in column (16b), insert "SG36" and "SG49"
1743	in column (16b), insert "SG36" and "SG49"
1744	in column (16b), insert "SG36" and "SG49"
1745	in column (16b), insert "SG36" and "SG49"
1746	in column (16b), insert "SG36" and "SG49"
1747	in column (16b), insert "SG36" and "SG49"
1750	in column (16b), insert "SG36" and "SG49"
1751	in column (16b), insert "SG36" and "SG49"
1752	in column (16b), insert "SG36" and "SG49"
1753	in column (16b), insert "SG36" and "SG49"
1754	in column (16b), insert "SG36" and "SG49"
1755 PG II	in column (16b), insert "SG36" and "SG49"
1755 PG III	in column (16b), insert "SG36" and "SG49"
1756	in column (16b), insert "SG36" and "SG49"
1757 PG II	in column (16b), insert "SG36" and "SG49"
1757 PG III	in column (16b), insert "SG36" and "SG49"
1758	in column (16b), insert "SG36" and "SG49"
1761 PG II	in column (16b), insert "SG35"
1761 PG III	in column (16b), insert "SG35"
1762	in column (16b), insert "SG36" and "SG49"
1763	in column (16b), insert "SG36" and "SG49"
1764	in column (16b), insert "SG36" and "SG49"
1765	in column (16b), insert "SG36" and "SG49"
1766	in column (16b), insert "SG36" and "SG49"
1767	in column (16b), insert "SG36" and "SG49"
1768	in column (16b), insert "SG36" and "SG49"

1769	in column (16b), insert "SG36" and "SG49"
1770	in column (16b), insert "SG36" and "SG49"
1771	in column (16b), insert "SG36" and "SG49"
1773	in column (16b), insert "SG36" and "SG49"
1775	in column (16b), insert "SG36" and "SG49"
1776	in column (16b), insert "SG36" and "SG49"
1777	in column (16b), insert "SG36" and "SG49"
1778	in column (16b), insert "SG36" and "SG49"
1779	in column (16b), insert "SG36" and "SG49"
1780	in column (16b), insert "SG36" and "SG49"
1781	in column (16b), insert "SG36" and "SG49"
1782	in column (16b), insert "SG36" and "SG49"
1783 PG II	in column (16b), insert "SG35"
1783 PG III	in column (16b), insert "SG35"
1784	in column (16b), insert "SG36" and "SG49"
1786	in column (16b), insert "SG36" and "SG49"
1787 PG II	in column (16b), insert "SG36" and "SG49"
1787 PG III	in column (16b), insert "SG36" and "SG49"
1788 PG II	in column (16b), insert "SG36" and "SG49"
1788 PG III	in column (16b), insert "SG36" and "SG49"
1789 PG II	in column (16b), insert "SG36" and "SG49"
1789 PG III	in column (16b), insert "SG36" and "SG49"
1790 PG I	in column (16b), insert "SG36" and "SG49"
1790 PG II	in column (16b), insert "SG36" and "SG49"
1791	[in column (6), insert "274" and "900"]
1792	in column (16b), insert "SG36" and "SG49"
1793	in column (16b), insert "SG36" and "SG49"
1794	in column (16b), insert "SG36" and "SG49"
1796 PG I	in column (16b), insert "SG36" and "SG49"
1796 PG II	in column (16b), insert "SG36" and "SG49"
1798	in column (16b), insert "SG36" and "SG49"
1799	in column (16b), insert "SG36" and "SG49"
1800	in column (16b), insert "SG36" and "SG49"
1801	in column (16b), insert "SG36" and "SG49"
1802	in column (16b), insert "SG36" and "SG49"
1803	in column (16b), insert "SG36" and "SG49"
1804	in column (16b), insert "SG36" and "SG49"
1805	in column (16b), insert "SG36" and "SG49"
1806	in column (16b), insert "SG36" and "SG49"
1807	in column (16b), insert "SG36" and "SG49"

1808	in column (16b), insert "SG36" and "SG49"
1809	in column (16b), insert "SG36" and "SG49"
1810	in column (16b), insert "SG36" and "SG49"
1811	in column (16b), insert "SG36" and "SG49"
1815	in column (16b), insert "SG36" and "SG49"
1816	in column (16b), insert "SG36" and "SG49"
1817	in column (16b), insert "SG36" and "SG49"
1818	in column (16b), insert "SG36" and "SG49"
1826 PG I	in column (16b), insert "SG36" and "SG49"
1826 PG II	in column (16b), insert "SG36" and "SG49"
1827	in column (16b), insert "SG36" and "SG49"
1828	in column (16b), insert "SG36" and "SG49"
1829	in column (16b), insert "SG36" and "SG49"
1830	in column (16b), insert "SG36" and "SG49"
1831	in column (16b), insert "SG36" and "SG49"
1832	in column (16b), insert "SG36" and "SG49"
1833	in column (16b), insert "SG36" and "SG49"
1834	in column (16b), insert "SG36" and "SG49"
1836	in column (16b), insert "SG36" and "SG49"
1837	in column (16b), insert "SG36" and "SG49"
1838	in column (16b), insert "SG36" and "SG49"
1839	in column (16b), insert "SG36" and "SG49"
1840	in column (16b), insert "SG36" and "SG49"
1848	in column (16b), insert "SG36" and "SG49"
1856	in column (6), insert "973"
1873	in column (16b), insert "SG36" and "SG49"
1898	in column (16b), insert "SG36" and "SG49"
1902	in column (16b), insert "SG36" and "SG49"
1905	in column (16b), insert "SG36" and "SG49"
1906	in column (16b), insert "SG36" and "SG49"
1908	[in column (6), insert "274" and "352"]
1938 PG II	in column (16b), insert "SG36" and "SG49"
1938 PG III	in column (16b), insert "SG36" and "SG49"
1939	in column (16b), insert "SG36" and "SG49"
1940	in column (16b), insert "SG36" and "SG49"
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"
1978	in column (6), insert "392"
2031 PG I	in column (16b), insert "SG36" and "SG49"
2031 PG II (both entries)	in column (16b), insert "SG36" and "SG49"
2032	in column (16b), insert "SG36" and "SG49"
2051	in column (16b), insert "SG35"

2067	in column (6), delete "186"
2071	in column (6), delete "186"
2214	in column (16b), insert "SG36" and "SG49"
2215 (both entries)	in column (16b), insert "SG36" and "SG49"
2216	in column (6), insert "973"
2217	in column (6), insert "973"
2218	in column (16b), insert "SG36" and "SG49"
2226	in column (16b), insert "SG36" and "SG49"
2240	in column (16b), insert "SG36" and "SG49"
2248	in column (16b), insert "SG35"
2258	in column (16b), insert "SG35"
2260	in column (16b), insert "SG35"
2262	in column (16b), insert "SG36" and "SG49"
2264	in column (16b), insert "SG35"
2266	in column (16b), insert "SG35"
2267	in column (16b), insert "SG36" and "SG49"
2269	in column (16b), insert "SG35"
2276	in column (16b), insert "SG35"
2280 (both entries)	in column (16b), insert "SG35"
2289	in column (16b), insert "SG35"
2305	in column (16b), insert "SG36" and "SG49"
2308	in column (16b), insert "SG36" and "SG49"
2326	in column (16b), insert "SG35"
2327	in column (16b), insert "SG35"
2331	in column (16b), insert "SG36" and "SG49"
2334	in column (16b), insert "SG35"
2353	in column (16b), insert "SG36" and "SG49"
2357	in column (16b), insert "SG35"
2359	in column (16b), insert "SG35"
2361	in column (16b), insert "SG35"
2383	in column (16b), insert "SG35"
2395	in column (16b), insert "SG36" and "SG49"
2407	in column (16b), insert "SG36" and "SG49"
2434	in column (16b), insert "SG36" and "SG49"
2435	in column (16b), insert "SG36" and "SG49"
2437	in column (16b), insert "SG36" and "SG49"
2438	in column (16b), insert "SG36" and "SG49"
2439	in column (16b), insert "SG36" and "SG49"
2440	in column (16b), insert "SG36" and "SG49"
2442	in column (16b), insert "SG36" and "SG49"
2443	in column (16b), insert "SG36" and "SG49"
2444	in column (16b), insert "SG36" and "SG49"
2475	in column (16b), insert "SG36" and "SG49"
2495	in column (16b), insert "SG36" and "SG49"
2496	in column (16b), insert "SG36" and "SG49"
2502	in column (16b), insert "SG36" and "SG49"
2503	in column (16b), insert "SG36" and "SG49"
2506	in column (16b), insert "SG36" and "SG49"
2507	in column (16b), insert "SG36" and "SG49"
2508	in column (16b), insert "SG36" and "SG49"

2509	in column (16b), insert "SG36" and "SG49"
2511	in column (16b), insert "SG36" and "SG49"
2513	in column (16b), insert "SG49"
2526	in column (16b), insert "SG35"
2531	in column (16b), insert "SG36" and "SG49"
2564 PG II	in column (16b), insert "SG36" and "SG49"
2564 PG III	in column (16b), insert "SG36" and "SG49"
2565	in column (16b), insert "SG35"
2571	in column (16b), insert "SG36" and "SG49"
2576	in column (16b), insert "SG36" and "SG49"
2577	in column (16b), insert "SG36" and "SG49"
2578	in column (16b), insert "SG36" and "SG49"
2580	in column (16b), insert "SG36" and "SG49"
2581	in column (16b), insert "SG36" and "SG49"
2582	in column (16b), insert "SG36" and "SG49"
2583	in column (16b), insert "SG36" and "SG49"
2584	in column (16b), insert "SG36" and "SG49"
2585	in column (16b), insert "SG36" and "SG49"
2586	in column (16b), insert "SG36" and "SG49"
2604	in column (16b), insert "SG36" and "SG49"
2610	in column (16b), insert "SG35"
2619	in column (16b), insert "SG35"
2626	in column (16b), insert "SG36"
2642	in column (16b), insert "SG36" and "SG49"
2670	in column (16b), insert "SG36" and "SG49"
2684	in column (16b), insert "SG35"
2685	in column (16b), insert "SG35"
2686	in column (16b), insert "SG35"
2691	in column (16b), insert "SG49"
2692	in column (16b), insert "SG36" and "SG49"
2698	in column (16b), insert "SG36" and "SG49", in column (6), insert "973"
2699	in column (16b), insert "SG36" and "SG49"
2739	in column (16b), insert "SG36" and "SG49"
2740	in column (16b), insert "SG36" and "SG49"
2742	in column (16b), insert "SG36" and "SG49"
2743	in column (16b), insert "SG36" and "SG49"
2744	in column (16b), insert "SG36" and "SG49"
2745	in column (16b), insert "SG36" and "SG49"
2746	in column (16b), insert "SG36" and "SG49"
2748	in column (16b), insert "SG36" and "SG49"
2751	in column (16b), insert "SG36" and "SG49"
2789	in column (16b), insert "SG36" and "SG49"
2790 PG II	in column (16b), insert "SG36" and "SG49"
2790 PG III	in column (16b), insert "SG36" and "SG49"
2794	in column (16b), insert "SG36" and "SG49"
2796	in column (16b), insert "SG36" and "SG49"
2798	in column (16b), insert "SG36" and "SG49"
2799	in column (16b), insert "SG36" and "SG49"

[2800	in column (6), delete "29"]
2802	in column (16b), insert "SG36" and "SG49"
2815	in column (16b), insert "SG35"
2817 PG II	in column (16b), insert "SG36" and "SG49"
2817 PG III	in column (16b), insert "SG36" and "SG49"
2819	in column (16b), insert "SG36" and "SG49"
2820	in column (16b), insert "SG36" and "SG49"
2823	in column (16b), insert "SG36" and "SG49"
2826	in column (16b), insert "SG36" and "SG49"
2829	in column (16b), insert "SG36" and "SG49"
2834	in column (16b), insert "SG36" and "SG49"
2841	in column (16b), insert "SG35"
2851	in column (16b), insert "SG36" and "SG49"
2865	in column (16b), insert "SG35", "SG36" and "SG49"
2869 PG II	in column (16b), insert "SG36" and "SG49"
2869 PG III	in column (16b), insert "SG36" and "SG49"
2879	in column (16b), insert "SG36" and "SG49"
2945	in column (16b), insert "SG35"
2967	in column (16b), insert "SG36" and "SG49"
2985	in column (16b), insert "SG36" and "SG49"
2986	in column (16b), insert "SG36" and "SG49"
2987	in column (16b), insert "SG36" and "SG49"
2988	in column (16b), insert "SG36" and "SG49"
3055	in column (16b), insert "SG35"
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"
3105	in column (16b), insert "SG72"
3106	in column (16b), insert "SG72"
3107	in column (16b), insert "SG72"
3108	in column (16b), insert "SG72"
3109	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"
3166	in column (6), delete "312", delete "380", delete "385" and insert "388"

3171	in column (6), delete "240" and insert "388"
3223	in column (9), add "PP94 PP95"
3224	in column (9), add "PP94 PP95"
3246	in column (16b), insert "SG36" and "SG49"
3250	in column (16b), insert "SG36" and "SG49"
3260 PG I	in column (16b), insert "SG36" and "SG49"
3260 PG II	in column (16b), insert "SG36" and "SG49"
3260 PG III	in column (16b), insert "SG36" and "SG49"
3261 PG I	in column (16b), insert "SG36" and "SG49"
3261 PG II	in column (16b), insert "SG36" and "SG49"
3261 PG III	in column (16b), insert "SG36" and "SG49"
3264 PG I	in column (16b), insert "SG36" and "SG49"
3264 PG II	in column (16b), insert "SG36" and "SG49"
3264 PG III	in column (16b), insert "SG36" and "SG49"
3265 PG I	in column (16b), insert "SG36" and "SG49"
3265 PG II	in column (16b), insert "SG36" and "SG49"
3265 PG III	in column (16b), insert "SG36" and "SG49"
3277	in column (16b), insert "SG36" and "SG49"
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
3360	in column (6), insert "973"
3361	in column (16b), insert "SG36" and "SG49"
3362	in column (16b), insert "SG36" and "SG49"
3412 PG II	in column (16b), insert "SG36" and "SG49"
3412 PG III	in column (16b), insert "SG36" and "SG49"
3419	in column (16b), insert "SG36" and "SG49"
3420	in column (16b), insert "SG36" and "SG49"
3421 PG II	in column (16b), insert "SG36" and "SG49"
3421 PG III	in column (16b), insert "SG36" and "SG49"
3425	in column (16b), insert "SG36" and "SG49"
3453	in column (16b), insert "SG36" and "SG49"
3456	in column (16b), insert "SG36" and "SG49"
3463	in column (16b), insert "SG36" and "SG49"

3472	in column (16b), insert "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"
3498	in column (16b), insert "SG36" and "SG49"

Add the following new entries:

(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	B2 B4	-	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"" by "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" by "hazard(s)". In .5 replace "risk" by "hazard". In .7 replace "risk" by "hazard" and replace "risk(s)" by "hazard(s)".

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

SP 133 Replace "risk" by "hazard".

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

SP 181 Replace "risk" by "hazard".

SP 186 is deleted.

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

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

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" by "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" by "hazard".

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

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

SP 296 Replace "risk" by "hazard".

SP 301 At the beginning, replace "substance" by "goods". Amend the fifth sentence 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)."

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 For packages containing not more than 3,000 kg, stabilization of fishmeal 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."

SP 310 In the first paragraph, replace "cells and batteries" by "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" by "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 column (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;

– for UN 3530, in addition, the marking requirements of 5.2.1.6 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" by "hazards". In the third paragraph, replace "risk" by "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 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 945 Amend this special provision to read as follows:

"[For portable tanks and bulk containers containing more than 3000 kg, stabilization of fish scrap or fishmeal shall be achieved to prevent spontaneous combustion by effective application of between 400 and 1,000 ppm (mg/kg) ethoxyquin, or between 2,000

and 4,000 ppm (mg/kg) BHT (butylated hydroxytoluene) at the time of production. The said application shall occur no longer than twelve months prior to shipment. At the time of shipment, the fish scrap or fishmeal shall contain at least 100 ppm (mg/kg) ethoxyquin or BHT based antioxidant.] "

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

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

SP 972 Replace "2.9.4.1 does" by "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 consigned under 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 consigned under 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 consigned under 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) 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) 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 on-board 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 on-board 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 on-board 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 on-board 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."

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 State's distinguishing sign for motor vehicles in international traffic" by "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" by "liquefied gas". In sub-paragraph (i), replace "liquid component" by "liquefied gas". In sub-paragraph (iv), replace "liquid component" by "liquefied gas". In sub-paragraph (v), replace "liquid component" by "liquefied gas". In the last paragraph, replace "liquid component" by "liquid phase".

In the header of column (4) of tables 1, 2 and 3, replace "risk" by "hazard".]

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

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

P208 In the header of column (4) of table 1, replace "risk" by "hazard".

P520 In additional provision 4, replace "risk" by "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" by "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 as follows: "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" by "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" by "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" by "electrically non-conductive".

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

In paragraphs (1)(c), (1)(d), (2)(c), and fourth indent of the additional requirements, replace "non-conductive" by "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);
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 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 to packing instructions P200 or P208;
- (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);

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;

(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;

(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

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." by:

"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);
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 In the second sentence, replace ", including for a battery contained in equipment" by "[and for batteries contained in a single item of equipment]/[a single item of equipment containing cells or batteries],". Amend the last sentence before the additional requirements to read: "The battery or the equipment shall be packed so that the battery or the equipment is protected against damage that may be caused by its movement or placement within the large packaging."

LP904 In the first sentence, after "or defective batteries", add "[and to damaged or defective cells and batteries contained in a single item of equipment/a single item of equipment containing cells or batteries]". At the end of the first sentence, delete ", including those contained in equipment".

Amend the second sentence to read as follows:

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

In the third sentence, replace "containing batteries" by "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" by "electrically non-conductive".

In .4, after "movement of the battery" add "or the equipment". Replace "non-conductive" by "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); 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 cells and batteries contained in a [single item of equipment], 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);

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 cells or batteries contained in 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);

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 batteries contained in a [single item of equipment]:
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);
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

LP906	PACKING INSTRUCTION	LP906

clearly identified and quantified; the reference list of possible hazards for lithium 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 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·kg^{-1}·K^{-1}], heating value [kJ·kg^{-1}], thermal conductivity [W·m^{1}·K^{1}], melting temperature and flammability temperature [K], heat transfer coefficient of the outer packaging [W·m^{-2}·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;

(h) The scenario consequences shall be assessed over a period covering all possible consequences (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" by "hazard".

4.1.9 Special packing provisions for radioactive material

4.1.9.1 General

4.1.9.1.5 Replace "risk" by "hazard" twice.

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

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" by "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" by "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."

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" by "hazard" twice.

5.1.5 General provisions for class 7

Replace paragraph 5.1.5.4.2 as follows:

"5.1.5.4.2 The documentation requirements of chapters 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;

.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; and

.3 the requirements of 5.4.2 and 5.4.4 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".

5.2.2 Labelling of packages including IBCs

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

5.2.2.1.2 Replace "risk" by "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" by "hazard" 3 times.

5.2.2.1.3.1 Replace "risk" by "hazard" twice.

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

5.2.2.1.5 Replace "risks" by "hazards".

5.2.2.1.6.3 Replace "risk" by "hazard".

5.2.2.1.9 Replace "risk" by "hazard".

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

5.2.2.1.11 Replace "risk" by "hazard".

Add the following new subsection 5.2.2.1.13:

"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 batteries 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

5.2.2.2.1.1.3 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.

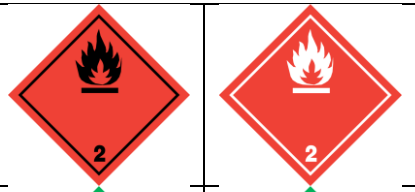
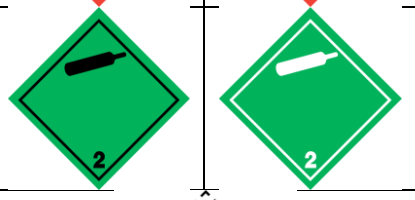
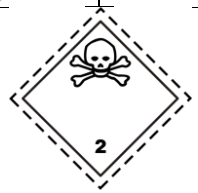
5.2.2.2.1.5 Replace "risk" by "hazard".

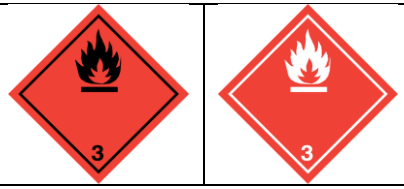
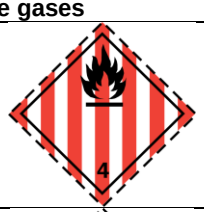
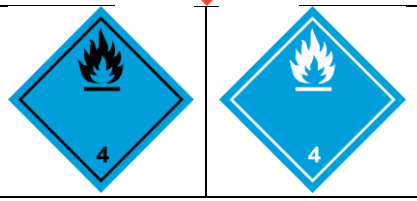
5.2.2.2.2 Amend 5.2.2.2.2 to read as follows:

"5.2.2.2.2 Specimen labels

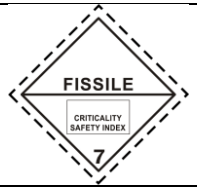
Note: Labels shall satisfy the provisions below and conform, in terms of colour, symbols and general format, to the models shown in 5.2.2.2.2. Corresponding models required for other modes of transport, with minor variations which do not affect the obvious meaning of the label, are also acceptable.

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	Division 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 the sub-paragraphs .1 to .3 as follows:

".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" by "hazards" and after "transport unit" add "and bulk container". In the second sentence, replace "risk" by "hazard". In subparagraph .2, replace "risk" by "hazard" and after "transport unit" add "and bulk container".

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

5.3.1.1.4.1 Replace paragraph 5.3.1.1.4.1 as follows:

"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 unit", add "or bulk container" twice.

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

Chapter 5.4
Documentation

5.4.1 Dangerous goods transport information

5.4.1.4.1.4 Replace "risk" by "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" by "hazard".

5.4.1.5.15 In the second paragraph, replace "the distinguishing sign for motor vehicles in international traffic" by "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.".

Renumber subsequent footnotes accordingly.

5.4.3 Documentation required aboard the ship

Replace the provisions of 5.4.3 as follows:

"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[1] 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. A copy of one of these documents shall be made available before departure to the person or organization designated by the port State authority.

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 5.4.3.2, if applicable, shall be made available before departure to the person or organization designated by the port State authority."

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.

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 division 6.2 substances)".

6.1.1 Applicability and general provisions

6.1.1.1 Applicability

6.1.1.1.2 (i) Replace "(subsidiary risks)" by "(subsidiary hazards)".

Add a new sub-paragraph .5 to read as follows:

".5 Packagings for division 6.2 infectious substances of Category A."

6.1.3 Marking

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

[1] 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).

6.1.3.8 (h) Replace "indicated by the distinguishing sign for motor vehicles in international traffic" by "indicated by the distinguishing sign used on vehicles in international road traffic*".

Footnote * 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."

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 hydraulic pressure test may be replaced" by "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" by "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" by "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" by "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" by "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" by: "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" by: "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" by: "the distinguishing sign used on vehicles in international road traffic*"'.

Footnote * reads as follow:

> "* 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" by: "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" by: "the distinguishing sign used on vehicles in international road traffic*"

Footnote * reads as follow:

"* 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" by: "the distinguishing sign used on vehicles in international road traffic*".

Footnote * 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."

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*" by "the distinguishing sign used on vehicles in international road traffic*".

Amend 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" by: "the distinguishing sign used on vehicles in international road traffic*".

Footnote * 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."

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" by "indicated by the distinguishing sign used on vehicles in international road traffic*".

Footnote * should 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" by "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" by "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" by "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" by "indicated by the distinguishing sign used on vehicles in international road traffic*".

Footnote * should 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 6.9
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" by: "the distinguishing signs used on vehicles in international road traffic*".

Footnote * 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."

PART 7
PROVISIONS CONCERNING TRANSPORT OPERATIONS

Chapter 7.1
General stowage provisions

7.1.4 Special stowage provisions

7.1.4 Renumber paragraphs 7.1.4.4.5, 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 Insert a new provision of 7.1.4.7 as follows:

"7.1.4.7 Stowage of stabilized dangerous goods

7.1.4.7.1 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 SW 30 as follows:

"SW 30 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" by "hazard".

7.2.3 Segregation provisions

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

7.2.3.4 Replace "risk" by "hazard" and replace "risks" by "hazards".

7.2.4 Segregation table

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

7.2.6 Special segregation provisions and exemptions

7.2.6.1 Replace "risk" by "hazard".

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."

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	-
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 "risk" by "hazard". In the examples of the Annex, paragraphs 3.2 and 4.2, replace "risk" by "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" by "hazard".

7.3.4.2.2.3 Replace "risk" by "hazard".

7.3.7 Cargo transport units under temperature control

Replace the provisions of 7.3.7 as follows:

"**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)[1] 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.

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

[1] 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.

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/(m2·K) for cargo transport units and 0.6 W/(m2·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,* 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.*

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.

* 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.

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 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" by "hazard", twice.

7.4.2.3.2 Replace the existing paragraph as follows:

"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 requirements

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

7.6.3 Segregation provisions

7.6.3.1.2 Replace "risk" by "hazard".

Chapter 7.7
Shipborne barges on barge-carrying ships

7.7.3 Barge loading

7.7.3.6 Replace "risk" by "hazard".

7.7.3.7.3 Replace "risk" by "hazard".

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" by "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 3462, add the following new entries:

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

APPENDICES
Appendix B
Glossary of terms

In the definition of "Initiation, means of", in .2, replace "significant risk" by "significant hazard".

INDEX

For the entry "2-DIMETHYLAMINOETHYL ACRYLATE", in the column "Name and description", add ", STABILIZED" at the end.

Insert the following new entries in alphabetical order:

Name and description	***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
LITHIUM BATTERIES INSTALLED IN CARGO TRANSPORT UNIT lithium ion batteries or lithium metal batteries	-	9	3536
TOXIC SOLID, FLAMMABLE, INORGANIC, N.O.S.	-	6.1	3535

***

ANNEX 3

DRAFT AMENDMENTS (39-18) TO THE IMDG CODE (PART 2)

Note: This annex contains only the relevant amendments (39-18) to the IMDG Code, obtained by the proposals directly submitted to E&T 27.

Chapter 3.2
Dangerous Goods List

3.2.1 Structure of the Dangerous Goods List

In the Dangerous Goods List, amend the following entries:

2217 with not more than 1.5% oil and not more than 11% moisture	In column (6), remove "117"
2555	in column (16a), add "SW1" and "H2"
2556	in column (16a), add "SW1" and "H2"
2850	In column (17), at the end, add "1-dodecene is not marine pollutant."

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

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"."

Chapter 3.4
Dangerous goods packed in limited quantities

3.4.6 Documentation

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

Chapter 5.4
Documentation

5.4.1 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."

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

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For the entry "Dodecene, *see*", in the column "Name and description", replace "Dodecene, *see*" by "Dodecene (except 1-dodecene), *see*".

After the entry for "Dodecene (except 1-dodecene)", insert the following new entry:

Name and description	***MP***	***Class***	***UN No.***
1-dodecene, *see*	-	3	2850

***

ANNEX 4

DRAFT MSC CIRCUALR

REVISED EMERGENCY RESPONSE PROCEDURES FOR SHIPS CARRYING DANGEROUS GOODS (EMS GUIDE)

CARRIAGE OF DANGEROUS GOODS

INTERNATIONAL MARITIME DANGEROUS GOODS (IMDG) CODE ANNEXES AND SUPPLEMENTS

Revised Emergency Response Procedures for Ships Carrying Dangerous Goods (EmS Guide)

1 The Maritime Safety Committee, at its […] session ([…]), approved the *Revised Emergency Response Procedures for Ships Carrying Dangerous Goods (EmS Guide)* (MSC/Circ.1025, as amended by MSC.1/Circ.1025/Add.1, MSC.1/Circ.1262, MSC.1/Circ.1360, MSC.1/Circ.1438, MSC.1/Circ.1476 and MSC.1/Circ.1522), set out in the annex, which had been prepared by the Sub-Committee on Carriage of Cargoes and Containers (CCC) at its [fourth] session ([11 to 15 September 2017]) and finalized by the Sub-Committee's Editorial and Technical Group.

2 Member States are invited to bring the annexed Revised EmS Guide to the attention of all concerned, taking into account the voluntary application date of […] of amendment (39-18) of the IMDG Code, pending its envisaged mandatory entry into force date of […].

3 This circular supersedes MSC/Circ.1025, as amended by MSC.1/Circ.1025/Add.1, MSC.1/Circ.1262, MSC.1/Circ.1360, MSC.1/Circ.1438, MSC.1/Circ.1476 and MSC.1/Circ.1522.

ANNEX

Revised Emergency Response Procedures for Ships Carrying Dangerous Goods (EmS Guide)

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Foreword

This EmS Guide contains guidance on Emergency Response Procedures for Ships Carrying Dangerous Goods including the Emergency Schedules (EmS) to be followed in case of incidents involving dangerous substances, materials or articles, or harmful substances (marine pollutants), regulated under the International Maritime Dangerous Goods Code (IMDG Code).

This edition takes into account the amendment 39-18 to the IMDG Code. The EmS Guide will be further amended as and when necessary to reflect amendments made to the IMDG Code.

Preamble

The purpose of this Guide is to provide guidance for dealing with fires and spillages (leakages) on board ships involving the dangerous goods listed in the International Maritime Dangerous Goods Code (IMDG Code).

In accordance with the International Safety Management Code (ISM Code), all ships, and the companies responsible for their operation, are required to maintain a Safety Management System (SMS). Within the SMS, procedures for responding to potential shipboard emergencies are required. This Guide is intended to assist shipowners, ship operators and other parties concerned with developing such emergency response procedures, which should be integrated into the ship's contingency plan.

In November 1997, the IMO Assembly adopted resolution A.852(20) on *Guidelines for a structure of an integrated system of contingency planning for shipboard emergencies*, which were further revised by resolution A.1072(28) in December 2013. This Guide should be integrated into Module IV on Response actions, as contained in paragraph 3.2.4.6 of the latter resolution, for cargo-related incidents.

In the event of a fire or spillage incident, initial actions should be carried out in accordance with the shipboard emergency plan. Where dangerous goods are involved, the responses in the emergency plan should be based on this Guide for specific dangerous goods having regard to, inter alia, the type of ship, the quantity and type of packaging of the dangerous goods and whether the goods are stowed on or under deck.

How to use this Guide

1 The guidance contained in this Guide is intended for fire and/or spillage (leakage) emergencies on board a ship involving packaged dangerous goods transported in accordance with the provisions of the IMDG Code. The Guide should not be used for emergencies involving bulk cargoes or any other fire and/or spillage on board a ship which does not involve packaged dangerous goods as cargo.

2 This guidance is for shipboard use where master and crew have to respond to a fire or a spillage without external assistance. The recommendations are based on the fire safety provisions contained in chapter II-2 of the 1974 Safety of Life at Sea Convention (SOLAS), as amended, and the provisions of the IMDG Code. The guidance should be integrated into the contingency plan for shipboard emergencies, which should be specific to the individual ship and should take into account the equipment on board.

3 There are international and national requirements for ships to contact or report to the nearest coastal State when an incident takes place involving the loss or likely loss of packaged dangerous goods (see Reporting Procedures). Contacting shore-based experts at an early stage irrespective of how insignificant the incident may seem to be is recommended. However, it should be noted that shore-based personnel or rescue/ coastguard experts may use different techniques to fight a fire or to deal with spillage on board a ship.

4 In this Guide, there is separate advice for fire and spillage emergencies which should be consulted accordingly.

5 This Guide should be used as follows:

.1 for fire and spillage, read and incorporate into the ship's training regime the INTRODUCTIONS to the emergency schedules, before any emergency occurs;

.2 in the event of an emergency involving packaged dangerous goods, consult the GENERAL GUIDELINES as a first step; and

.3 obtain detailed advice for the specific cargo(es) involved by reading the relevant EMERGENCY SCHEDULE(S) (EmS) for the cargo(es).

Fire

Introduction to the Emergency Schedules for FIRE

1 Be prepared

1.1 Preventing a fire from occurring is the most important part of a shipboard safety programme. However, once a fire has started, a well-trained crew is the best defence for bringing the fire under control. Given the complexity of extinguishing a fire involving dangerous goods, it is essential that the advice in this Guide be incorporated into the ship's training regime so that the crew will be able to respond to a fire casualty in a timely and effective manner.

1.2 This Guide should be integrated into a Safety Management System (SMS). Procedures contained in the shipboard emergency plan should be tailored to the individual ship.

1.3 The firefighting procedures within the EmS SCHEDULES are different for "on deck" and "under deck" stowage. For specific ship types (e.g. hatchless container ships) or cargo holds (e.g. open vehicle decks of ferries), these two procedures have to be assigned specifically to the individual ship.

1.4 Given the toxic nature of some of the dangerous goods involved, accommodation spaces should be protected from fire and smoke as far as possible (e.g. water spray). Therefore, the ventilation systems for working and living spaces should be shut off, closed and secured to reduce the possibility of vapours, dusts and gases penetrating these spaces. In some instances, it may be necessary to turn the ship's accommodation spaces upwind, if possible.

1.5 The safety of firefighting personnel is most important. Use of appropriate protective clothing (i.e. a firefighter's outfit when dealing with a fire) and self-contained breathing apparatus, to protect skin and lungs from toxic and/or corrosive liquids, vapours, dusts and gases, is essential. This equipment should be suitable for each individual member of the firefighting team, as working with such equipment requires a high level of fitness and training. It should be kept in mind that even a weak acute illness may interfere with a crew member's fitness. In addition, pregnant crew members should not be exposed to dangerous vapours.

1.6 It is also essential to ensure that there is always an escape route for firefighting personnel despite the limitations due to narrow exit paths and the danger of falling overboard.

2 Identification of the dangerous good(s) involved

2.1 It is essential to identify the dangerous good(s) involved in the fire in order that the specific EmS FIRE SCHEDULE(S) for the cargo(es) may be consulted and appropriate action taken. This is important because some dangerous goods are incompatible with some firefighting media and could exacerbate the situation (e.g. use of a water-based extinguishing medium on water-reactive cargoes).

2.2 An identification number with four digits preceded by the letters "UN" is assigned to all dangerous goods. From the UN Number, it is possible to find the appropriate EmS FIRE SCHEDULE. The Dangerous Goods List in part 3, chapter 3.2, of the IMDG Code contains the names and the UN numbers, as well as the EmS SCHEDULE NUMBERS. The special Dangerous Goods Manifest and the detailed Stowage Plan required by SOLAS regulation VII/4.2 will also contain the proper shipping name and UN number of the dangerous good(s) concerned. Packages will usually be labelled as well.

2.3 Specific information as to properties of dangerous goods may also be found in the Dangerous Goods List in the IMDG Code. Dangerous goods are classified and labelled according to their hazards. Labels and marks on packages provide a warning of the general risks to be encountered. Personnel should understand the labelling system.

2.4 Emergency preparedness should form part of the ship's Safety Management System as required by the ISM Code. Prepared information can reduce errors during a fire emergency. Therefore, it is recommended that the EmS SCHEDULE(S) be identified and included on the Dangerous Goods Manifest and Stowage Plan recording the stowage position of the cargo. That will enable key members of the crew to know in advance which emergency procedures could be necessary. In the event of a fire, the allocation of a specific EmS FIRE SCHEDULE via identification of cargo via the UN number takes time and is open to error, especially in mixed cargoes in one container. Furthermore, some firefighting procedures may require specific media and operations could be affected by the stowage location of such media. The advice given in the EmS FIRE SCHEDULE should be directly usable based on the stowage information, without time-consuming identification and location of the cargo involved.

3 Cool and suffocate

3.1 In general, fires require heat (energy) and oxygen to start burning. Only a limited number of chemicals do not need oxygen from the air. Therefore, the aim of firefighting is to exclude oxygen and to cool the cargo(es). On board ship, this is generally carried out by using water spray or gas extinguishing systems.

3.2 Some burning cargoes will need special firefighting media (like dry inert material) to suffocate the fire. In such circumstances, normal firefighting procedures are often impracticable, and concentrating on cooling nearby cargo and ship structures is recommended in such cases.

3.3 Firefighters should be made aware of the hazards of opening doors of an over-heated space or freight container which is suspected of containing cargo on fire. There may be a lack of oxygen inside and fresh air from outside the space may instantly start a fire, and cause a flashback that could injure the firefighters. Cool down the container first!

4 Seek advice

4.1 Expert advice should be sought irrespective of how insignificant the fire may seem to be when dealing with dangerous goods fires. Such advice could be given by:

.1 ship operating companies (e.g. designated persons);

.2 emergency information centres (such as CHEMTREC in the USA);

.3 specialized agencies;

.4 professional responders;

.5 port State authorities;

.6 coastguard;

.7 fire brigades; and

.8 manufacturers of the products.

5 Evacuation

Within some EmS FIRE SCHEDULES the phrase "Sudden or short-term events (e.g. explosions) may endanger the safety of the ship" or the phrase "The danger of uncontrolled spread of fire should be considered" has been introduced. Depending on the type of ship and on the volume of dangerous goods allocated to this specific FIRE SCHEDULE, it may be necessary to consider abandoning the ship at an early stage. In this case, the master should be aware of the hazard and should decide whether the ship requires assistance.

6 Firefighting media

6.1 Water

6.1.1 Water is the obvious firefighting medium at sea and is recommended for most fires involving dangerous goods. However, it should be noted that shore-based firefighters may use a different medium.

6.1.2 When water is applied to a burning cargo, the temperature is reduced and the fire will be extinguished when the temperature drops below the ignition point. However, water is not suitable to extinguish all fires involving dangerous goods. Different firefighting media should be used if so indicated on the specific EmS FIRE SCHEDULE.

6.1.3 If the fire is under deck, consideration should be given to the stability of the ship when flooding the hold with water.

6.1.4 Some dangerous goods will react chemically with water, producing flammable and/or toxic gases. The most effective way to extinguish a fire involving these dangerous goods is to smother them with a dry inert powdered material. However, the availability of suitable inert material on board is limited. It may also be dangerous to approach the fire in order to use inert material properly. Consequently, the most appropriate method of extinguishing the fire may be to use copious quantities of water. This would have an overall cooling effect on the fire even though the water may react with the dangerous goods involved.

6.1.5 Ships are equipped with a number of dual-purpose spray/jet nozzles as required by SOLAS. Most EmS FIRE SCHEDULES recommend that the nozzles be set to spray when used to fight fires. Water spray may also be achieved by using water jets from some distance. This method of producing water spray is generally recommended. However, it is dangerous to direct a water jet onto the fire at close range because this could result in the spread of burning material.

6.1.6 The term "copious quantities of water" used within the EmS FIRE SCHEDULES refers to the minimum total quantities of water provided for optimal firefighting using four jets of water, as required by SOLAS regulation II-2/10. The master and crew should know the practical limitations that may be encountered at specific stowage locations in this respect.

6.1.7 Following the advice "use copious quantities of water" or "water spray from as many hoses as possible" may interfere with the safety of the ship with regard to the ship's stability. Stress forces on the hull due to increased quantities of water in the ship should be considered.

6.2 Fixed gas fire-extinguishing systems

6.2.1 If a fixed gas fire-extinguishing system is used for incidents under deck, all hatches and vent dampers should be closed and ventilation shut off before the system is activated. If smoke is seen coming from around the hatches, the leaks should be sealed with any suitable material available.

6.2.2 The majority of the fixed gas fire-extinguishing systems use carbon dioxide (CO_2), but some use nitrogen (N_2) as the extinguishing medium. The instructions on board should be followed. The fire control plan will sometimes specify a given volume of gas to be applied to a given space. No advantage will be gained by exceeding this volume of gas where burning dangerous goods are involved.

6.2.3 It is important to realise that it will take an appreciable time for the space to cool after the fire has been extinguished. Therefore it would be extremely dangerous to reopen the hatches since the extinguishing gas would escape and air would enter the space again, thus allowing the fire to re-ignite. The ship's on-board instructions for such cases should be followed.

6.2.4 Fixed gas fire-extinguishing systems are not effective against all fires. EmS FIRE SCHEDULES may contain specific information in this regard.

6.3 Fixed pressure water spraying systems

6.3.1 In some ships (e.g. ro-ro ships and car ferries), some cargo spaces may be fitted with a water drencher or spray system instead of a fixed gas fire-extinguishing system. There will be instructions on board which should be followed.

6.3.2 A closed cargo space should be ventilated to clear it of smoke and toxic gases after the fire has been extinguished and the space has cooled. The ventilation equipment should be of a certified safe type for smoke removal. Evidence that the space is cooling down can be obtained by monitoring adjacent bulkheads and decks. Thereafter, a firefighting team should look for any small remaining fires and inspect the surrounding cargo. After the fire has been extinguished, the cargo should be kept under surveillance until its normal temperature is reached.

6.4 Foam

In general, foam is an effective firefighting medium for fires involving flammable liquids. The foam forms a layer on the liquid thereby excluding oxygen and reducing heat. However, it is less effective on solid substances on fire. Most foams contain water and should not be used on fires where the use of water is restricted because of adverse chemical reaction.

6.5 Dry chemicals

Dry chemicals may be an effective extinguishing medium for fires involving water-reactive substances and metals. The dry chemical should not react with the dangerous goods involved in the fire. Some dangerous goods require a specific dry chemical to extinguish a fire.

7 Dangerous goods exposed to fire

7.1 Rupture and cooling

7.1.1 Where possible, packages should be removed from the vicinity of the fire. In general, heated material will expand, thus needing more volume and creating pressure in the package. This will affect the integrity of the package which could lead to rupture and dispersal of the contents. Effective cooling can lower the possibility of rupture.

7.1.2 Where there is a danger that heat will have already started to cause a chemical or physical change to the dangerous substance, packages should not be moved. Care should always be exercised, for example, with those substances liable to polymerize, as this reaction may continue for a long time after the removal of the heat source. Provided no discharge or pumping overboard problem arises, cooling should continue for many hours after the fire has been extinguished. After heat evolution has ceased, cooling with water may be stopped. A careful watch should be kept on the stability of the ship.

7.1.3 The EmS FIRE SCHEDULES advise that a number of dangerous goods should be removed or jettisoned if there is a likelihood of their involvement in a fire. However, where full or nearly full cargo transport units are involved, such guidance may be impractical. In that case, the advice should be taken to indicate that the goods are particularly dangerous. Personnel on board should fight the fire and cool nearby cargo as far as possible. It should be borne in mind that some heated dangerous goods may have already damaged the packaging or may explode during handling. Consequently, moving or jettisoning burning cargo should only be attempted with utmost caution.

7.2 Spillage

7.2.1 It should be remembered that leakage of dangerous goods can be very dangerous for the crew and for the ship. Fire and explosion can rupture nearby packages or tanks, creating a spillage.

7.2.2 If a leak is discovered, the hazards associated with that leak should be ascertained immediately. In cases involving leaks of flammable liquids or flammable gases (class 3 and class 2.1 labels respectively), the crew should withdraw to a well-protected position. Air-vapour and air-gas mixtures are liable to explode and such an explosion may injure crew members and damage the ship.

7.2.3 Many toxic gases are odourless and colourless. A number of liquids will produce toxic vapours if exposed to heat. In an emergency, the ship should be manoeuvred to keep the bridge, living quarters and crew upwind as far as possible.

7.2.4 The EmS SPILLAGE SCHEDULES should be consulted when dealing with a leakage.

8 Personal protection

8.1 Ship's personnel

8.1.1 Many vapours and gases of dangerous goods produced by a fire are hazardous to health. In the case of fire, the use of a firefighter's outfit and self-contained breathing apparatus is essential. Only trained personnel should use this equipment, which should be well maintained. Particular attention should be given to ensuring that toxic vapours or fumes do not penetrate occupied areas of the ship (e.g. bridge, living quarters, machinery spaces, working areas, etc.).

8.1.2 According to the ship's fire emergency plan, ventilation systems to living and working spaces should be shut off, closed and secured to reduce the possibility of vapours, dusts, and gases from penetrating these areas.

8.2 Firefighting team

8.2.1 Chapter II-2 of SOLAS requires firefighter's outfits, full chemical protective suits and self-contained breathing apparatus to be readily available on board. Masters are reminded that personnel will need regular training in the use of self-contained breathing apparatus and that special attention should be given to ensure that face masks fit satisfactorily at all times.

8.2.2 Self-contained breathing apparatus is essential for firefighting because dangerous goods on fire produce various substances hazardous to health. Handling water jets from some distance or cooling of heated cargo may not require the use of self-contained breathing apparatus. However, decisions not to use self-contained breathing apparatus should be undertaken carefully and on a case-by-case basis.

8.2.3 Firefighting outfits offer only limited protection from dangerous goods. Firefighting outfits are not chemical suits. Chemical protective clothing is designed to protect against specific properties of chemicals. In general, there will be no such thing as a single type chemical protective suit on board. Therefore, contact with dangerous goods should be avoided. Chemical protective clothing is not resistant to fire or heat.

9 First aid and actions after termination of firefighting

9.1 Any contamination with hazardous material should be immediately removed from the skin and then washed, for example with copious quantities of water. Information on medical first aid is provided in the IMO/WHO/ ILO Medical First Aid Guide for Use in Accidents Involving Dangerous Goods (MFAG) published by IMO. Be prepared to use the MFAG!

9.2 Cargo may re-ignite after a fire has been extinguished. An efficient patrol should be maintained in the spaces in which the fire occurred and in any adjoining spaces to ensure that any new ignition or leakages are dealt with promptly. Fire-extinguishing systems should remain on stand-by. Post a fire watch.

9.3 After extinguishing the fire, all emergency team personnel should ensure that all contamination of equipment and protective clothing is removed and washed immediately. Equipment should be restored and re-stowed for use.

9.4 There are reporting procedures under SOLAS and MARPOL which have to be followed (see Reporting Procedures).

10 Special notes on classes of dangerous goods

10.1 Explosives – class 1

10.1.1 In the event of a fire, everything should be done to prevent the spread of the fire to containers which contain class 1 goods. If it is not possible to prevent the spread of the fire, all personnel should immediately withdraw from the area.

10.1.2 Many explosives will burn to the point of an explosion. The master's main concern will be whether or not there is likely to be a mass explosion. Such an explosion could damage the ship. If goods of division 1.1 or division 1.5 are involved, this likelihood will exist. The time between fire reaching the explosives and the subsequent mass explosion will be of the order

of a few seconds to minutes. The master should ascertain how large a quantity of such explosives is involved. A few kilograms are unlikely to sink the ship, but above this a clear risk to the safety of the crew and the stability of the ship should be considered. Sudden or short-term events may endanger the safety of the ship.

10.1.3 Explosives of divisions 1.2, 1.3, 1.4, and 1.6 are unlikely to explode en masse. Irrespective of the division of the explosives, any firefighting should take place from behind substantial cover. If the risk to firefighters is too high, hoses could be lashed to the rail or other suitable fixtures and left unmanned.

10.1.4 Neither exclusion of air nor the use of smothering material is likely to be effective against a fire involving explosives. The use of the largest possible quantity of water in the shortest possible time is the only means of attempting to prevent a rise in temperature that could affect the chemical stability of the explosives.

10.1.5 Some dangerous goods of this class have been wetted or immersed in water. As they dry, they become unstable. The master should seek advice (see section 4 above).

10.2 Gases – class 2

10.2.1 Gases are substances usually transported in cylinders, flasks, portable tanks, aerosol dispensers and bottles under varying degrees of pressure. The gases may be flammable, toxic or corrosive and may be compressed, liquefied or refrigerated.

10.2.2 Gases will not start burning at the valve, unless there has been an ignition source nearby (e.g. fire or heat). The location of the burning gas needs to be identified because it may be the heart of the fire. The heating of the receptacle is the most serious danger because of the possibility of rupture, rocketing or explosion. In the event of a fire, receptacles containing gas should be liberally sprayed with water to keep them as cool as possible.

10.2.3 Non-burning leakages from receptacles of flammable gases may give rise to explosive mixtures in air. If a fire caused by the ignition of leaking gas is extinguished within a cargo space before the leak is stopped, accumulation of gas will occur. This will result in an explosive mixture or a toxic or suffocating atmosphere. The EmS SPILLAGE SCHEDULES should be consulted.

10.2.4 Extremely low temperatures around leakages of some liquefied gases are an additional hazard (other than flammability and toxicity). Emergency teams should avoid contact with such leakages and the immediate vicinity.

10.3 Flammable liquids – class 3

10.3.1 It is dangerous to direct a jet of water onto a fire involving flammable liquids. Many flammable liquids float on water and the water jet would spread the liquid, thus creating a greater danger. Closed containers exposed to fire will become pressurized and a rupture will occur.

10.3.2 Heated flammable liquid will release vapours that may start burning instantly with explosive effect. Consequently, firefighting personnel should stay in a well-protected position and use water spray on the area of the fire. This will cool down the temperature of the liquid and the air-vapour mixture.

10.4 Flammable solids – class 4.1

10.4.1 This class of substances includes flammable solids, water-wetted explosives (i.e. desensitized explosives) and self-reactive substances.

10.4.2 Flammable solids will easily ignite, and the appropriate EmS FIRE SCHEDULE should be consulted. In the event of a fire, water-wetted explosives (i.e. desensitized explosives) will effectively have the properties of a class 1 product. The special notes on class 1 explosives (see 10.1) and the relevant EmS FIRE SCHEDULES should be consulted.

10.4.3 Self-reactive substances are sometimes transported under temperature controlled conditions where the control temperature will depend upon the specific properties of the substance being transported. If the control temperature is exceeded, the refrigeration unit has to be inspected. If the temperature control cannot be restored, the manufacturer should be consulted as soon as possible. The manufacturer should be similarly consulted if smoke is observed. The cargo should then be kept under surveillance.

10.5 Spontaneously combustible substances – class 4.2

10.5.1 This class of substances includes pyrophoric substances, which will instantly burn on contact with air, and self-heating substances, which lead to spontaneous combustion.

10.5.2 Although the use of dry inert powdered material to smother the fire would be the preferred option, in most circumstances such a procedure may not be possible. Two methods of dealing with such fires are possible:

.1 controlled burning: stay in a well-protected position. Let the goods burn. Many goods of this class react dangerously with water: refer to the relevant EmS FIRE SCHEDULE. In such cases, contact with water may intensify burning. Therefore, it is not recommended to apply water directly on the burning goods. When portable water monitors providing water shield function are available: generate a water screen to prevent spread of fire. The fire involving the goods should be left to burn out completely. If the fire has already spread to the adjacent cargo which is not reacting with water (see relevant EmS FIRE SCHEDULE): fight this fire from a safe distance;

.2 fight the fire from a safe distance: if the location of the fire makes it possible, copious quantities of water should be used immediately. Although the goods on fire will react with water and create heat, a large quantity of water will cool down the reaction and prevent further heat radiation. However, water should not be used when the location of the fire makes it impossible to apply copious amounts of water directly onto the goods. Refer to the relevant EmS FIRE SCHEDULE.

10.6 Substances dangerous when wet – class 4.3

10.6.1 This class of substances reacts violently with water, evolving flammable gases. The heat of the reaction is sometimes sufficient to initiate a fire.

10.6.2 Although the use of dry inert powdered material to smother the fire would be the preferred option, in most circumstances such a procedure may not be possible. Two methods of dealing with such fires are possible:

.1 controlled burning: stay in a well-protected position. Let the goods burn. All goods of this class react dangerously with water: refer to the relevant EmS FIRE SCHEDULE. Contact with water will intensify burning. Therefore, it is not recommended to apply water directly on the burning goods. When portable water monitors providing water shield function are available: generate water screen to prevent spread of fire. The fire involving the goods should be left to burn out completely. If the fire has already spread to adjacent cargo which is not reacting with water (see relevant EmS FIRE SCHEDULE): fight this fire from a safe distance;

.2 fight the fire from a safe distance: refer to the relevant EmS FIRE SCHEDULE, since it is possible that firefighting with water may intensify the fire and generate the evolution of flammable gases which could explode in mixtures with air.

10.7 Oxidizing substances – class 5.1

10.7.1 This class of substances is liable to evolve oxygen and therefore to accelerate a fire. These substances, while in themselves not necessarily combustible, may cause the combustion of other material (e.g. sawdust or paper) or contribute to the fire, leading to an explosion.

10.7.2 Fires in which these substances are present are difficult to extinguish, because the ship's firefighting installation may not be effective. Everything possible should be done to prevent the spread of fire to containers containing these dangerous goods. However, if fire reaches the cargo, personnel should be withdrawn immediately to a well-protected position.

10.8 Organic peroxides – class 5.2

10.8.1 This class of substances is liable to burn vigorously. Some substances have a low decomposition temperature and are transported under temperature controlled conditions, where the control temperature will depend upon the specific properties of the substance being transported.

10.8.2 If the temperature control cannot be restored, the manufacturer should be consulted as soon as possible even if evolution of smoke has ceased. The cargo should then be kept under surveillance. The surrounding area should be kept isolated because liquid may be ejected from relief arrangements.

10.9 Toxic substances – class 6.1

Substances of this class are poisonous by contact or inhalation, and the use of self-contained breathing apparatus and firefighters' outfits is therefore essential.

10.10 Infectious substances – class 6.2

These are substances which are known or reasonably expected to contain pathogens, (i.e. micro-organisms that are known or reasonably expected to cause infectious disease in humans or animals). Pathogens may survive the fire and self-contained breathing apparatus should therefore be used.

10.11 Radioactive material – class 7

10.11.1 Many radioactive materials are transported in packages designed to retain their containment and shielding in accidents. However, under extreme fire conditions, failure of containment or loss of shielding or criticality safety could result in significant hazard to personnel. Long-term exposure of any class 7 package to extreme heat should be avoided and in emergencies they should be kept as cool as possible using copious quantities of water. If a packaging of radioactive material has been exposed to any significant fire, expert advice should be sought. Suspected contamination of safety and firefighting equipment should be removed as quickly as possible.

10.11.2 Some packages may have a class 7 label and other hazard labels. Such additional hazards may be greater than the radiation hazard. In that case, actions as specified in the applicable EmS FIRE SCHEDULE should be followed.

10.11.3 Although radiation monitors are not required by regulation on board ships, applicable relevant provisions on segregation, separation or radiation protection programmes (e.g. paragraphs 1.5.2 and 7.1.4.5.18 of the IMDG Code) or the INF Code may require monitors on board. For ships carrying radiation monitoring equipment, monitoring of radiation levels is recommended.

10.12 Corrosive substances – class 8

10.12.1 These substances are extremely dangerous to humans, and many may cause destruction of safety equipment. Burning cargo of this class will produce highly corrosive vapours. Consequently, wearing self-contained breathing apparatus is essential.

10.13 Miscellaneous dangerous substances and articles – class 9

10.13.1 This class includes those substances, materials and articles which are deemed to possess some danger, but which are not classified within the criteria of classes 1 to 8. No general guidelines are applicable to these goods. They have been allocated to the relevant EmS FIRE SCHEDULE according to their hazards in the event of a fire.

10.14 Marine pollutants

10.14.1 A number of substances within all of the above classes have also been designated as marine pollutants. Packages containing these substances will bear a Marine Pollutant mark.

10.14.2 In the case of leakage resulting from burning cargo, it is important to be aware that any spillage of a marine pollutant which is washed overboard will pollute the sea. It is, however, more important to fight a fire on board a ship rather than to prevent pollution of the sea.

General guidelines for FIRE

- Think safety first!
- Avoid any contact with dangerous substances.
- Keep away from fire, smoke, fumes and vapours.
- Sound the fire alarm and start firefighting procedures.
- Keep the bridge and living quarters upwind if possible.
- Locate stowage position of cargo that is burning or evolving smoke.
- Identify cargo.
- Obtain UN numbers and the EmS FIRE SCHEDULE of the dangerous goods involved.
- Consider which measures of the EmS FIRE SCHEDULE are applicable and should be followed.
- Check if other dangerous goods may potentially be involved in the fire and identify the relevant EmS FIRE SCHEDULE.
- Wear suitable protective clothing and self-contained breathing apparatus.
- Be prepared to use the Medical First Aid Guide (MFAG).
- Contact the designated person of the company responsible for the operation of the ship or a rescue coordination centre to obtain expert advice on dangerous goods emergency response measures.

Precaution: Contamination of the skin with dangerous goods should be removed and washed immediately.

Emergency Schedules for FIRE

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FIRE SCHEDULE Alfa

F–A

GENERAL FIRE SCHEDULE

General comments		In a fire, exposed cargoes may explode or their containment may rupture. Fight fire from a protected position from as far away as possible.
Cargo on fire on deck	Packages	Create water spray from as many hoses as possible.
	Cargo Transport Units	
Cargo on fire under deck		Stop ventilation and close hatches. Use cargo space fixed fire-extinguishing system. If this is not available, create water spray using copious quantities of water.
Cargo exposed to fire		If practicable, remove or jettison packages which are likely to be involved in fire. Otherwise, keep cool using water.
Special cases: UN 1381, UN 2447		After extinguishing the fire, treat immediately as for spillage (see relevant EmS SPILLAGE SCHEDULE).

FIRE SCHEDULE Bravo

F–B

EXPLOSIVE SUBSTANCES AND ARTICLES

General comments		In a fire, exposed cargoes may explode or their containment may rupture. Fight fire from a protected position from as far away as possible. All crew members should be made aware of the explosion hazard and instructed to take appropriate action. SUDDEN OR SHORT-TERM EVENTS (E.G. EXPLOSIONS) MAY ENDANGER THE SAFETY OF THE SHIP.
Cargo on fire on deck	Packages	Use copious quantities of water from as many hoses as possible. Cargo will explode or burn fiercely. Extinguishing may not be possible.
	Cargo Transport Units	
Cargo on fire under deck		Cargo will explode or burn fiercely. Extinguishing will not be possible. Stop ventilation and close hatches. Use cargo space fixed fire-extinguishing system. If this is not available, create water spray using copious quantities of water.
Cargo exposed to fire		Do not move packages that have been exposed to heat. If practicable, remove or jettison packages which are likely to be involved in the fire. If the packages are not directly involved in the fire, efforts should be concentrated on preventing the fire from reaching the cargo. This is done by keeping the packages wet by using water jets from as far away as practicable to drive the fire away. If the fire reaches the cargo, the firefighters should withdraw to a safe area and continue to fight the fire. Where practicable, articles having been exposed to the fire should be kept separated from unexposed articles. They should be kept wet and monitored from a safe distance.
Special cases: UN 0018, UN 0019, UN 0020, UN 0021, UN 0301 UN 0248, UN 0249 UN 3268		Ammunition producing tear or toxic gas. The crew should be aware of the hazard. After explosion, only self-contained breathing apparatus will protect efficiently. Consult SPILLAGE SCHEDULE S-Z. These water-activated devices will become more liable to explosion on contact with water. SAFETY DEVICES, electrically initiated, could be subject to self-sustaining decomposition if heated. The temperature could reach 500°C, producing gas. This process may lead to an explosion of the cargo even after the exposure to heat has ended.

FIRE SCHEDULE Charlie

F–C
NON-FLAMMABLE GASES

<table>
<tr><td colspan="2">General comments</td><td>Gases in closed tanks exposed to heat may explode suddenly in or after a fire situation by a boiling liquid – expanding vapour explosion (BLEVE). Heated or ruptured cylinders may rocket.
Gases listed under this schedule are non-flammable. However, some gases will support combustion though not flammable itself.
Fire may produce leakages. Most gases allocated to this schedule are hazardous to health. Some are corrosive. Create water spray.
Identify the source of the fire and take appropriate action.</td></tr>
<tr><td rowspan="2">Cargo on fire on deck</td><td>Packages</td><td rowspan="2">Use copious quantities of water from as many hoses as possible.</td></tr>
<tr><td>Cargo Transport Units</td></tr>
<tr><td colspan="2">Cargo on fire under deck</td><td>Use fixed fire-extinguishing system.</td></tr>
<tr><td colspan="2">Cargo exposed to fire</td><td>If practicable, remove or jettison packages which are likely to be involved in the fire. Otherwise, cool for several hours using water.
Heated or ruptured cylinders may rocket.</td></tr>
<tr><td colspan="2">Special cases:
UN 1003, UN 1070, UN 1072, UN 1073, UN 2201, UN 3156, UN 3157, UN 3513, UN 3515, UN 3518</td><td>Although these cargoes are non-flammable, they will intensify the fire.</td></tr>
</table>

FIRE SCHEDULE Delta

F–D
FLAMMABLE GASES

General comments		Gases in closed tanks exposed to heat may explode suddenly in or after a fire situation by a *boiling liquid – expanding vapour explosion* (BLEVE). Crew members should be aware of the explosion hazard and take appropriate action. Keep tanks cool with copious quantities of water. Fight fire from a protected position from as far away as possible. Extinguishing a burning gas leak may lead to the formation of an explosive atmosphere. Flames may be invisible.
Cargo on fire on deck	Packages	Create water spray from as many hoses as possible. Do not try to extinguish a gas flame.
	Cargo Transport Units	Cool burning transport units and nearby cargo exposed to the fire with copious quantities of water. Do not try to extinguish a gas flame.
Cargo on fire under deck		Stop ventilation and close hatches. Use cargo space fixed fire-extinguishing system. If this is not available, create water spray using copious quantities of water.
Cargo exposed to fire		If practicable, remove or jettison packages which are likely to be involved in the fire. Otherwise, keep cool for several hours using water.
Special cases: UN 1038, UN 1075, UN 1965, UN 1966, UN 1972, UN 3138, UN 3160, UN 3309, UN 3312		SUDDEN OR SHORT-TERM EVENTS (E.G. EXPLOSIONS) MAY ENDANGER THE SAFETY OF THE SHIP.
UN 1001, UN 3374		*Acetylene* is a gas which is particularly dangerous due to its potential to explode. Rough handling or local heating may lead to delayed explosion. Keep cool for several hours using water. Do not move receptacles. All cylinders that have been subjected to rough handling or to local heating should be jettisoned.
UN 3501, UN 3504, UN 3505		A flammable liquid, paste or powder may be expelled if the package is ruptured. Also consult FIRE SCHEDULE F-E.

FIRE SCHEDULE Echo

F–E

NON-WATER-REACTIVE FLAMMABLE LIQUIDS

General comments		Cargoes in tanks exposed to heat may explode suddenly in or after a fire situation by a *boiling liquid – expanding vapour explosion* (BLEVE). Keep tanks cool with copious quantities of water. Fight fire from a protected position from as far away as possible. Stop leakage or close open valve if practicable. Flames may be invisible.
Cargo on fire on deck	Packages	Create water spray from as many hoses as possible.
	Cargo Transport Units	Cool burning transport units and nearby cargo exposed to the fire with copious quantities of water.
Cargo on fire under deck		Stop ventilation and close hatches. Use cargo space fixed fire-extinguishing system. If this is not available, create water spray using copious quantities of water.
Cargo exposed to fire		If practicable, remove or jettison packages which are likely to be involved in the fire. Otherwise, keep cool for several hours using water.
Special cases: UN 1162, UN 1250, UN 1298, UN 1717, UN 2985		Cargoes will create hydrochloric acid in contact with water: stay away from effluent.

FIRE SCHEDULE Foxtrot Part 1 of 2

F–F

TEMPERATURE-CONTROLLED SELF-REACTIVES AND ORGANIC PEROXIDES

General comments		Exposed cargoes may decompose violently. Crew members should be aware of the explosion hazard and take appropriate action. Fight fire from a protected position from as far away as possible. Switch off electrical power supplies only during firefighting. Check temperature readings if possible. Measures have to be taken to alert the crew when the temperature of the cargo increases. In case of a temperature increase or smoke evolution, follow the relevant instructions. Contact the manufacturer (consignor) of the cargo as soon as possible.
Cargo on fire on deck	Packages	Not applicable.
	Cargo Transport Units	Cool burning transport units and nearby cargo exposed to the fire with copious quantities of water. After the fire has been extinguished, do not open the unit until well after smoke evolution has ceased. If possible, restore cooling. Keep under surveillance.
Cargo on fire under deck		Not applicable. According to the IMDG Code, under deck stowage is not allowed. Radio for expert ADVICE.
Cargo exposed to fire	Cargo Transport Units with IBCs, Packages	Cool units exposed to fire with water. After the fire has been extinguished, check and restore cooling. Keep under surveillance. Check temperature frequently. In case of temperature increase or smoke evolution, follow the relevant instructions.
	Tanks	Keep personnel away from tanks as liquid may be ejected from relief arrangements. Cool units exposed to fire with copious quantities of water. After the fire has been extinguished, check and restore cooling. Keep under surveillance. After the fire has been extinguished, water spray should be continued to cool down the outer parts of the tanks. Check refrigeration unit, keep tanks under surveillance. Check temperature frequently.
Temperature increase	Cargo Transport Units with IBCs, Packages	If the *control temperature* is exceeded, the refrigeration unit has to be inspected (consult manual) and repaired. If not possible and/or temperature control cannot be restored, contact the manufacturer of the cargo. If the *emergency temperature* is reached but the refrigeration unit is operating correctly, contact the manufacturer of the cargo and consider disposal of packagings. Keep firefighting team on stand-by. If the *emergency temperature* is reached due to cooling unit failure, contact the manufacturer of the cargo. When emergency temperature is reached, 12 hours are left for repairing the cooling unit and/or disposal of packaging. After that time, keep a safe distance and prepare for firefighting.
	Tanks	If the *control temperature* is exceeded, the refrigeration unit has to be inspected (consult manual) and repaired. If not possible and/or temperature control cannot be restored, contact manufacturer of the cargo. If the *emergency temperature* is reached but the refrigeration unit is operating correctly, contact the manufacturer of the cargo. Keep at a safe distance and consider emptying of tank overboard via bottom outlet using a flexible hose. If the *emergency temperature* is reached due to failure of the cooling unit, repairs may be undertaken as long as the temperature has not exceeded the emergency temperature by more than 5°C. After that, consider emptying the tank using a flexible hose attached to the bottom opening of the tank if provided.
Special cases: None.		

FIRE SCHEDULE Foxtrot *(continued)* Part 2 of 2

F–F

TEMPERATURE-CONTROLLED SELF-REACTIVES AND ORGANIC PEROXIDES

Smoke evolution	Cargo Transport Units with IBCs, Packages	Keep firefighting team on stand-by. The freight container should not be approached. When smoke evolution increases, keep safe distance and prepare for firefighting. After smoke has ceased, check refrigeration system. Follow guidelines for temperature increase. Keep under surveillance, as new smoke evolution might take place.
	Tanks	Keep personnel away from the tank, as liquid may be ejected from relief arrangements. Cool unit exposed to fire with water. Use water spray from a protected position. In case smoke or pressure-relief venting is moderate and temperature is below the emergency temperature, consider emptying the tank overboard via bottom outlet, using a flexible hose. Even when smoke evolution or pressure-relief venting has ceased, water spray should be continued for some hours and the tank should be kept under surveillance, as new smoke evolution might take place.
Special cases: None.		

FIRE SCHEDULE Golf

F–G
WATER-REACTIVE SUBSTANCES

General comments		In a fire, exposed cargoes may explode or their containment may rupture. Liquid material leaking from ruptured receptacles may be ignited and spread the fire. Cargoes in tanks exposed to heat may explode suddenly in or after a fire situation by a *boiling liquid – expanding vapour explosion* (BLEVE). Fight fire from a protected position from as far away as possible. Use of copious quantities of water at once is recommended to cool down the heat radiation and to cool down heated cargo nearby. Water in direct contact with the material will start or intensify burning of that material. Only in locations where direct access to the cargo is possible and where the cargo on fire can be submerged with water, large quantities of water may significantly reduce the thermal reactivity and stop the fire. THE DANGER OF UNCONTROLLED SPREAD OF FIRE SHOULD BE CONSIDERED.
Cargo on fire on deck	Packages	DO NOT use water or foam; smother with dry inert powdered material when available or let fire burn. Cool nearby cargo with copious quantities of water.
	Cargo Transport Units	Let the fire burn. Cool nearby cargo with copious quantities of water. Use the water shield function of portable water monitors when available, to prevent the spread of fire. Try to avoid getting water into the cargo transport unit on fire.
Cargo on fire under deck		Stop ventilation and close hatches. The fixed gas fire-extinguishing system should be used. If this is not available: DO NOT use water onto the material in enclosed spaces under deck. Cool nearby cargo with copious quantities of water.
Cargo exposed to fire		If practicable, remove or jettison packages which are likely to be involved in the fire. Otherwise cool the cargo with copious quantities of water. Use the water shield function of portable water monitors when available, to prevent the spread of fire.
Special cases: Class 4.3, packing group I		In contact with water, large volumes of flammable gases are produced, which when not instantly ignited may form a highly dangerous explosive atmosphere.

FIRE SCHEDULE Hotel

F–H

OXIDIZING SUBSTANCES WITH EXPLOSIVE POTENTIAL

General comments		In a fire, exposed cargoes may explode or their containment may rupture. Crew members should be aware of the explosion hazard and take appropriate action. Fight fire from a protected position from as far away as possible. SUDDEN OR SHORT-TERM EVENTS (E.G. EXPLOSIONS) MAY ENDANGER THE SAFETY OF THE SHIP.
Cargo on fire on deck	Packages	Create water spray from as many hoses as possible.
	Cargo Transport Units	
Cargo on fire under deck		OPEN HATCHES to provide maximum ventilation. Fixed gas fire-extinguishing systems may not be effective on these fires. Create water spray from as many hoses as possible.
Cargo exposed to fire		Do not move packages that have been exposed to heat. If practicable, remove or jettison packages which are likely to be involved in the fire. If the packages are not directly involved in the fire, efforts should be concentrated on preventing the fire from reaching the cargo. This is done by keeping the packages wet by using water jets from as far away as practicable to drive the fire away. If the fire reaches the cargo, the firefighters should withdraw to a safe area and continue to fight the fire from a safe position. Where practicable, articles having been exposed to the fire should be kept separated from unexposed articles. They should be kept wet and monitored from a safe distance.
Special cases: None.		

FIRE SCHEDULE India

F–I

RADIOACTIVE MATERIAL

General comments		Evacuate compartment or downwind area of non-essential personnel. Do not touch damaged packages. In cases of suspected radioactive contamination, limit entry of firefighters for the shortest time possible. For ships carrying radiation monitoring equipment, measure radiation levels. Radio for expert ADVICE. After the fire has been extinguished, clean ship's surfaces with copious quantities of water. Decontaminate firefighters before protective clothing is removed. Isolate potentially contaminated clothing and equipment. If exposure of personnel is suspected, clean body and hair with warm water and soap; discharge resultant washings directly overboard. Record the names of potentially exposed persons. Ensure medical examination of these persons after reaching any medical staff. For ships carrying radiation monitoring equipment, continue monitoring of radiation levels after fire is extinguished.
Cargo on fire on deck	Packages	Create water spray from as many hoses as possible.
	Cargo Transport Units	Create water spray from as many hoses as possible. Cool burning transport units and nearby cargo exposed to the fire with copious quantities of water.
Cargo on fire under deck		Stop ventilation and close hatches. Use cargo space fixed fire-extinguishing system. If this is not available, create water spray using copious quantities of water.
Cargo exposed to fire		If practicable, remove or jettison packages which are likely to be involved in the fire. Otherwise, cool for several hours using copious quantities of water.
Special cases:		
UN 2977, UN 2978, UN 3507		Chemical hazard greatly exceeds radiation hazard. Material reacts with moisture to form toxic and corrosive gas. The run-off may be corrosive. Keep clear. Exposed cargoes may explode in a fire. Create water spray. Leak may be evident by visible and irritating vapours. Released vapours may also react violently with hydrocarbons (fuel).
UN 3332, UN 3333		If the source capsule is identified as being out of its packaging, do not touch. Stay away, minimize exposure to radiation by limiting time near material and by maximizing distance. Radio for expert ADVICE.
Subsidiary label class 4.2 or class 4.3		All radioactive material with subsidiary risk label 4.2 or 4.3 affixed (e.g. pyrophoric uranium or thorium metal): Radio for expert ADVICE. *On deck:* Do not use water onto the material. Cool nearby cargo with copious quantities of water, although the fire could intensify for a short period. Do not spray small quantities of water onto the fire, use copious quantities of water. *Under deck:* Stop ventilation and close hatches. The fixed gas fire-extinguishing system should be used. If this is not available, do not use water onto the material in enclosed spaces under deck. With open hatches, cool nearby cargo with copious quantities, although the fire could intensify for a short period. Do not spray small quantities of water onto the fire, use copious quantities of water only.

FIRE SCHEDULE Juliet

F–J

NON-TEMPERATURE-CONTROLLED SELF-REACTIVES AND ORGANIC PEROXIDES

General comments		Exposed cargoes may decompose violently. Crew members should be aware of the explosion hazard and take appropriate action. Fight fire from a protected position from as far away as possible. Exposed cargoes may decompose violently in a fire.
Cargo on fire on deck	Packages	Not applicable.
	Cargo Transport Units	Cool burning transport units and nearby cargo exposed to the fire with copious quantities of water. After the fire has been extinguished, carry on water spraying of the container for several hours. Do not open container until well after smoke evolution has ceased. After this, cool down packages or IBCs if practicable for at least one hour with water. Otherwise, check contents on regular intervals. In case smoke is evolved again, apply further water cooling. Dispose of residues overboard. Clean the area thoroughly. After the fire has been extinguished, keep cargo transport unit under surveillance.
Cargo on fire under deck		Not applicable – According to the IMDG Code, under deck stowage is not allowed. Radio for expert ADVICE.
Cargo exposed to fire	Cargo Transport Units with IBCs, Packages	Cool unit exposed to the fire with water. After the fire has been extinguished, keep transport unit under surveillance. In case of smoke evolution, follow the relevant instructions.
	Tanks	Keep personnel away from tank, as fluid ejection from relief arrangements might take place. Cool unit exposed to the fire with water. Contact the manufacturer (consignor) of the cargo. Cooling the tank should be continued until the temperature is below 50°C. Check temperature frequently. If temperature increases again, cool unit with water. Consider emptying the tank overboard via bottom outlet, using a flexible hose.
Smoke evolution	Cargo Transport Units with IBCs, Packages	Cool unit with water. Use water spray from a protected position. Do not open the unit until well after smoke evolution has ceased. After this, cool down packages or IBCs if practicable for at least one hour with water. Otherwise, check contents on regular intervals. In case smoke is evolved again, apply further water cooling. Dispose of residues overboard. Clean the area thoroughly.
	Tanks	Keep personnel away from the tank, as fluid ejection from relief arrangements might take place. Cool unit exposed to fire with water. Use water spray from a protected position. Even when smoke evolution or pressure-relief venting has ceased, cooling the tank should be continued until the temperature is below 50°C. Check temperature frequently. If temperature increases again, cool unit with water. Consider emptying tank overboard via bottom outlet, using a flexible hose.
Special cases: None.		

Spillage

Introduction to the Emergency Schedules for SPILLAGE

1 Be prepared

1.1 Incidents involving dangerous goods may result in spillages from such goods, and the magnitude of the effects of an incident depends upon the type and amount of product released, together with the type of any other product involved and whether the spillage is on deck or in enclosed spaces.

1.2 Spillages could create additional hazards to those indicated by classification and labelling of the dangerous goods (e.g. the spillage of a flammable liquid may create an explosive atmosphere). Of particular concern are leakages of reactive chemicals, which in contact with other materials or further spillages will produce additional or other chemicals (e.g. toxic gases).

1.3 When dealing with a spillage on board a ship, the value of crew training and of familiarity with the general contingency plan will become evident. Drills and exercises specific to the cargoes on board at the time should be a part of shipboard routine.

1.4 This Guide should be integrated into the ship's Safety Management System. Procedures contained within the shipboard emergency plan have to be tailored to the individual ship. Spillage response procedures within the EmS SPILLAGE SCHEDULES are differentiated for "on deck" and "under deck" stowage. For specific ship types (e.g. hatchless container ships) or cargo spaces (e.g. open vehicle decks of ferries) these two procedural categories have to be assigned specifically to the individual ship (e.g. run-off considerations concerning bilges and drains).

2 Personal protection

2.1 The safety of the emergency personnel is of paramount importance.

2.2 The likelihood of the development of an explosive, flammable or toxic atmosphere should be considered.

2.3 Full protective clothing resistant to the effects of the specific dangerous substance involved should be worn. The protective clothing should cover all skin so that no part of the body is unprotected. Wearing self-contained breathing apparatus is essential to protect against inhalation of toxic or corrosive dusts, vapours or gases.

2.4 Emergency teams should avoid direct contact with any dangerous goods regardless of the protective clothing being used. If direct contact takes place when dealing with a spillage, the contact time should be kept to a minimum.

2.5 It is a requirement of SOLAS that four sets of full protective clothing resistant to chemical attack should be provided in addition to firefighters' outfits.

2.6 Firefighters' outfits are not designed to protect against chemical hazards and chemical-resistant clothing is not designed to protect against fire. Masters are reminded that personnel should have regular training in the use of self-contained breathing apparatus, and that special attention should be paid to ensuring that face masks fit satisfactorily at all times.

2.7 Responders should also ensure that any chemical protective clothing is used with other suitable protection against the specific hazards involved.

3 General response

3.1 The safety of the emergency personnel is most important.

3.2 Working spaces and living quarters should be protected by water spray wherever possible. Ventilation systems for living quarters and working spaces should be shut off, closed and secured to reduce the possibility of smoke, dust, fumes and gases from entering these areas. Particular care should be given to ventilation inlets (e.g. machinery and accommodation spaces). It may be necessary to turn the ship to ensure that the accommodation spaces are upwind.

3.3 Before entering cargo holds or compartments, the emergency personnel should determine the oxygen content of the space's atmosphere and should test for the presence of dangerous vapours. If a confined space entry is attempted, the use of self-contained breathing apparatus is essential. Only trained personnel should use this equipment, which should be well maintained.

3.4 It is essential to ensure that there is always an escape route for emergency personnel despite the limited means of escape due to narrow exit paths and the danger of falling overboard.

3.5 Decontamination and medical first aid also need to be considered. Arrange for a decontamination station to be set up at a suitable safe location.

3.6 The general response to spillage involving dangerous goods can be subdivided into the following tactical objectives:

.1 Identification;

.2 Rescue;

.3 Isolation; and

.4 Response.

Experience from previous incidents has shown that these objectives can normally be achieved in this order.

4 Identification of the dangerous goods involved

4.1 It is essential to identify the dangerous good(s) involved in the spillage in order that the specific EmS SPILLAGE SCHEDULE(S) for the cargo(es) may be consulted and appropriate action taken. This is important because some dangerous goods are incompatible with some media available for dealing with a spillage.

4.2 An identification number with four digits preceded by the letters "UN" is assigned to each dangerous good. From the UN number, it is possible to find the appropriate EmS SPILLAGE SCHEDULE. The Dangerous Goods List in part 3 of chapter 3.2 of the IMDG Code contains the names and the UN numbers, as well as the EmS SCHEDULE numbers. The Dangerous Goods Manifest and the Stowage Plan required by SOLAS regulation VII/4.2 will also contain the proper shipping name and UN number of the dangerous good(s) concerned. Packages will usually be labelled as well.

4.3 Specific information as to properties of dangerous goods may also be found in the Dangerous Goods List in the IMDG Code. Dangerous goods are classified and labelled according to their hazards. Labels and marks on packages provide a warning of the general risks to be encountered. Personnel should understand the labelling system. It will also be beneficial to consult other sources of information. A safety data sheet provided by the manufacturer may be one such source of additional information. Seek expert advice from manufacturers, specialized agencies or professional responders.

4.4 Emergency preparedness should form part of the ship's Safety Management System as required by the ISM Code. Prepared information can reduce errors during a spillage emergency. Therefore, it is recommended that the EmS SCHEDULE(S) be identified and included within the Dangerous Goods Manifest and Stowage Plan, so directly connected to the stowage position of the cargo. This will enable key members of the crew to know in advance which emergency procedures would be necessary. In the event of a spillage, the allocation of a specific EmS SPILLAGE SCHEDULE via identification of the cargo via the UN number takes time and is open to error, especially in mixed cargoes in one container. Furthermore, some spillage response procedures may require specific use of material which could be hampered by an inaccessible stowage location. After locating the spillage area, the advice given in the EmS SPILLAGE SCHEDULE should be directly available from the Dangerous Goods Manifest and Stowage Plan.

5 Rescue

5.1 The safety of personnel should be the highest priority. One of the first concerns after evaluating the situation of the incident is finding and rescuing victims. This includes searching for and evacuating persons who may be exposed or who are disoriented or disabled by the release. It might be necessary to rescue persons from elevated places or confined spaces or those who are pinned under wreckage.

5.2 Appropriate equipment will need to be available, and prior training is essential for such circumstances.

6 Isolation

6.1 The objective of isolation is to limit the number of personnel exposed to the spilled material. This may be achieved by simply roping or taping off dangerous areas. Consider sealing off ventilation, air conditioning and other openings to living and working spaces.

6.2 At sea, the master has the capability and discretion to alter course and speed to ensure that dangerous gases or vapours are kept away from personnel, living quarters or ventilation inlets.

6.3 Consider the evacuation of passengers and members of the crew.

7 Response

7.1 At sea, human and other resources are limited. So in most cases involving spillage of dangerous goods, the most effective response will probably be to wash the substance overboard or jettison it. Attempts to repack dangerous goods may expose personnel to unreasonable risks.

7.2 The response to the spillage should be in accordance with the appropriate EmS SPILLAGE SCHEDULE(S) for the dangerous good(s) involved in the incident. The emergency team should take all reasonable precautions when dealing with the spillage and remember that the safety of personnel is most important.

8 Seek advice

8.1 Always seek expert ADVICE when dealing with dangerous goods spills. Such ADVICE could be given by:

.1 ship operating companies (e.g. designated persons);

.2 emergency information centres (such as CHEMTREC in the USA);

.3 specialized agencies;

.4 professional responders;

.5 port State authorities;

.6 coastguard;

.7 fire brigades; and

.8 manufacturers of the products.

9 Materials to be used

9.1 Water is the obvious medium to be used when dealing with a spillage on board a ship. It is recommended in the majority of cases to be used in copious quantities to wash the spillage overboard. However, certain dangerous goods react violently with water, producing flammable and toxic vapours. Others, for example marine pollutants, will produce pollution if washed overboard.

9.2 The term "copious quantities of water" used within the EmS SPILLAGE SCHEDULE(S) refers to the minimum total quantities of water provided for optimal firefighting with four jets as defined by SOLAS regulation II-2/10, Construction requirements. Master and crew should consider practical limitations at specific stowage locations in this respect.

9.3 Inert material should be used for spillages where it would be dangerous to use water. The inert material should be dry.

9.4 Sawdust should not be used as it is liable to be ignited by ignition sources or in contact with a number of substances. Cement may be used as an inert material for barricading.

9.5 An electric discharge may ignite some materials (e.g. explosives). Therefore, the use of non-certified safe type equipment within spillage areas may be dangerous. For some materials, "non-sparking footwear" is recommended (e.g. rubber boots without metal parts).

10 Action after spillage has been dealt with

10.1 Decontamination of personnel, clothing and ship's structures

10.1.1 After the spillage has been dealt with, the emergency team personnel should ensure that all contamination of equipment and protective clothing is removed and washed immediately. All equipment should be restored and re-stowed for further use.

10.1.2 Areas not affected initially may have been contaminated during response procedures. Crew members coming in contact with improperly decontaminated areas may become contaminated. Clean the site thoroughly before any unprotected personnel are allowed to enter.

10.1.3 Contaminated material should be properly disposed of or be cleaned.

11 First aid

11.1 Information on medical first aid is provided in the IMO/WHO/ILO Medical First Aid Guide for Use in Accidents Involving Dangerous Goods (MFAG). Be prepared to use the MFAG!

11.2 Any contamination of the skin with a dangerous substance should be immediately removed and then washed, for example with water. Radio for expert advice if personnel have been exposed to dangerous goods.

12 Special notes on specific dangerous goods classes

12.1 Based on the specific properties of the individual dangerous goods listed under one UN number, experts have allocated the substances, articles and materials to EmS SPILLAGE SCHEDULES. The allocation has not been based on the classification and labelling of the substances only. However, to help the mariner who is used to the handling and labelling of packaged dangerous goods to understand the advice given in the EmS SPILLAGE SCHEDULES, this introduction based on classification properties of substances is given.

12.2 Explosives – class 1

12.2.1 Properly packaged explosives are unlikely to detonate unless exposed to a fire or source of ignition. Within the divisions of this class, there are differences in explosive power. From a mariner's standpoint, the volumes of explosives concerned are of primary importance for the safety of the ship. However, even small volumes of spilled material may ignite and injure individual crew members. In general, spilled explosive substances are less hazardous when kept wet (see SPILLAGE SCHEDULE S-X).

12.2.2 Some explosive mixtures are stabilized in such a way that water will separate explosives from the stabilizer, thus creating a higher risk. The explosive component becomes very sensitive to shock and heat. The explosive should be kept mixed under water and washed overboard. Wetted articles should be jettisoned (see SPILLAGE SCHEDULE S-Y).

12.2.3 Some ammunition types contain a toxic material or a tear-gas substance. In addition to the explosive hazard, the toxicity hazard has to be realized. Use of self-contained breathing apparatus is essential (see SPILLAGE SCHEDULE S-Z).

12.3 Gases – class 2

12.3.1 A release of a flammable gas (class 2.1) is the preliminary step leading to a potential vapour cloud explosion (VCE). For a blast to take place, the substance has to mix with air in a quantity that will allow the mixture to form a cloud. As soon as a friction (electrostatic potential) lies within the explosive range and encounters an ignition source, a flash fire, a deflagration or, sometimes, even a detonation may occur, with devastating consequences. In dealing with gas leakages, let the gas evaporate and drift away. Keep away all sources of ignition. Water spray could reduce the ignition potential of the cloud (see SPILLAGE SCHEDULE S-U).

12.3.2 Non-toxic, non-flammable gases (class 2.2) may displace oxygen, creating a suffocation hazard. Ventilation of all areas concerned is important (see SPILLAGE SCHEDULE S-V).

12.3.3 Toxic gases (class 2.3) when released may fill an area of the ship or a compartment with a toxic atmosphere. Therefore, it is important to shut off, close and secure all ventilation supplying the accommodation, machinery spaces and bridge to protect against such gases. Self-contained breathing apparatus is essential for the emergency team (see SPILLAGE SCHEDULE S-U).

12.3.4 Liquefied gases can cause the additional hazard of very low temperatures around the point of leakage. Such a leakage will be particularly dangerous when the leakage is in the liquid phase from a container where very low temperatures will be experienced. The emergency team should avoid contact with liquefied gases if at all possible.

12.3.5 Oxidizing gases can react violently with a number of organic materials. These reactions can generate heat, produce flammable gases and are liable to ignite combustible materials.

12.4 Flammable liquids – class 3

12.4.1 The release of a vaporized flammable liquid is the preliminary step leading to a potential vapour cloud explosion (VCE). For a blast to take place, the vapour has to mix with air in a quantity that will allow the mixture to form a cloud. As soon as a friction (electrostatic potential) lies within the explosive range and encounters an ignition source, a flash fire, a deflagration or, sometimes, even a detonation may occur, with devastating consequences. Water spray will reduce the vaporization and the ignition potential of the cloud. Keep away all sources of ignition (see SPILLAGE SCHEDULE S-D).

12.4.2 At high concentrations, many flammable liquids exhibit a narcotic effect (which is not labelled accordingly), a short-term potentially lethal effect (which is identified by a class 6.1 label) or a long-term toxic effect (not labelled). In all cases, the use of self-contained breathing apparatus is therefore recommended (see SPILLAGE SCHEDULE S-D).

12.4.3 Some flammable liquids are corrosive to human skin, the ship's hull or normal personal protection equipment. Their vapours are toxic by inhalation. Therefore, washing of spillages and forcing vapours overboard with water spray is the method of choice. It is important to close all ventilation to protect the accommodation and machinery spaces and the bridge from the vapours. Crew members should stay away from any effluent (see SPILLAGE SCHEDULE S-C).

12.4.4 Many flammable liquids are not soluble in water and will float on the water (e.g. mineral oil, gas oil, petroleum). In general, high concentrations of these substances are not lethal but exhibit a narcotic effect. The crew should be aware of that and stay away from highly

concentrated vapours. Mineral oil is considered to be a marine pollutant although not classified nor labelled as such. Depending on the quantities, oil spilt into the sea may cause problems and is usually given a high profile by the media. In case of spillage on board, the dominating hazard is flammability. Keep away all sources of ignition (see SPILLAGE SCHEDULE S-E).

12.5 Flammable solids – class 4

12.5.1 This class contains many different substances and varying hazards within its three sub-classes. Many are not solids. Some of these materials require special agents to be used for cleaning/absorbing as they react unfavourably with water, sand or other inert material. The procedures and materials to be used in case of a spillage are identified in ten different schedules.

12.5.2 Spilled flammable solids may create an explosive atmosphere that could be ignited easily. Whereas some solids (e.g. articles) can be repacked (see SPILLAGE SCHEDULE S-I), others will contaminate ships' surfaces, which have to be cleaned thoroughly by washing the substances overboard (see SPILLAGE SCHEDULE S-G).

12.5.3 A few flammable substances are transported in a molten state. To clean contaminated areas, the use of inert materials is possible to enable the emergency team to shovel up the spillage and dispose of it overboard (see SPILLAGE SCHEDULE S-H).

12.5.4 Flammable solids that exhibit explosive properties when spilt from a package should be kept wet and disposed of overboard. Drying material being ignited (e.g. by heat or friction) would lead to a detonation (see SPILLAGE SCHEDULE S-J).

12.5.5 Temperature-controlled self-reactive substances are also classified as flammable solids under class 4.1. Spillage is often connected to a failure of temperature control, leading to chemical reaction and creating a fire hazard. If not disposed of overboard, the relevant FIRE SCHEDULE should be consulted (see SPILLAGE SCHEDULE S-K).

12.5.6 Some spontaneously combustible substances could react with water (see SPILLAGE SCHEDULE S-L). Smothering with dry inert material and the immediate disposal overboard could limit the ignition hazard. Others will ignite within minutes (see SPILLAGE SCHEDULE S-M) and firefighting will be necessary (see FIRE SCHEDULE F-G).

12.5.7 Depending on the chemical properties, substances which are dangerous when wet (class 4.3) could be collected and disposed of overboard (see SPILLAGE SCHEDULE S-P), or could be kept dry and disposed of overboard or could be washed overboard with copious quantities of water even though a reaction with water will occur (see SPILLAGE SCHEDULES S-N and S-O). The use of water spray is recommended in case of the development of flammable gases (see SPILLAGE SCHEDULE S-O).

12.5.8 Many flammable solids, substances liable to spontaneous combustion and most substances that are dangerous when wet are hazardous to health by skin contact or by inhalation of dust. The use of self-contained breathing apparatus and appropriate chemical protection (e.g. chemical suit) is therefore recommended in all cases.

12.6 Oxidizing substances and organic peroxides – class 5

12.6.1 Dangerous goods of class 5 contain oxygen, and some will ignite combustible material on contact. In general, contact with substances of class 5 will be harmful to the skin, eyes and mucous membranes. The use of self-contained breathing apparatus and appropriate chemical protection (e.g. chemical suit) is therefore recommended.

12.6.2 Spilled oxidizing substances (class 5.1) could ignite combustible material or destroy materials (e.g. personal protection) by their chemical reactivity. Such spillages should be washed overboard. All crew members should stay away from effluent (see SPILLAGE SCHEDULE S-Q).

12.6.3 Organic peroxides (class 5.2) are highly reactive and some may explode when ignited. Class 5.2 liquids are flammable liquids which should be kept away from all sources of ignition. These substances will instantly destroy eyes. Some substances are transported under temperature control which is necessary to prevent reaction (mostly noticed as smoke evolution) and development of heat which may lead to fire (see SPILLAGE SCHEDULE S-R).

12.7 Toxic and infectious substances – class 6

12.7.1 The effects of toxic substances (class 6.1) may appear at once during exposure to them or may be delayed until after exposure. Inhalation is the major route for vapours, gases, mists and dusts. Skin and eye contact is of concern for the emergency team. The use of self-contained breathing apparatus and appropriate chemical protection (e.g. chemical suit) is recommended in all cases. Vapours of toxic liquids may fill an area of the ship or a space with a toxic atmosphere. Therefore, in case of vapour development, it is important to shut off, close and seal off all ventilation leading to accommodation and machinery spaces and the bridge (See SPILLAGE SCHEDULE S-A).

12.7.2 Some toxic substances are also flammable. In this case, the safety advice for both flammable and toxic liquids should be followed (see SPILLAGE SCHEDULE S-D).

12.7.3 In case of spillage of toxic substances, be prepared to use the MFAG.

12.7.4 The substances of class 6.2 are infectious, biological products, diagnostic specimens, clinical waste, etc. In case of spillage of such substances, different types of a biohazard may develop. Some spilled goods of class 6.2 could create illness of crew members after skin contact or inhalation. Whereas washing overboard is advised for on-deck spillage, waiting for expert ADVICE is recommended for under-deck spillages. Any skin contact or inhalation of mists or dusts should be avoided. Expert ADVICE is particularly important in respect of exposure risk, decontamination methods and reporting procedures (see SPILLAGE SCHEDULE S-T).

12.7.5 Most toxic substances and many infectious substances are also toxic to marine animals. Consult safety data sheets or experts for individual properties if needed.

12.8 Radioactive material – class 7

12.8.1 Many radioactive materials are transported in packages designed to retain their containment and shielding under accident conditions. Failure of the containment resulting in spillage that could be a significant hazard to personnel would only be expected under very severe conditions. Damp surfaces on undamaged or slightly damaged packages are seldom an indication of packaging failure. If a packaging of radioactive material appears to have leaked its accidental contents, expert ADVICE should be sought.

12.8.2 Some packages may have both a class 7 label and other hazard labels. Such additional hazards may be greater than the radiation hazard. In that case, actions as specified in the applicable SPILLAGE SCHEDULES should be followed.

12.8.3 Although radiation monitors are not required by regulation on board ships, applicable relevant provisions on segregation, separation or radiation protection programme (e.g. paragraphs 1.5.2 and 7.1.4.5.18 of the IMDG Code) or the INF Code may require monitors on board. For ships carrying radiation monitoring equipment, monitoring the extent of contamination is possible.

12.8.4 Spillage may constitute a release of any solid, liquid or gaseous radioactive material from its packaging. Personal protection material and equipment on board cannot generally provide protection against the health effects of penetrating ionizing radiation. Therefore, to protect personnel from the potential effects of radiation from spilled cargo (which may include the release from the packaging of special form radioactive material), two parameters are important when responding to spillages of these materials: TIME and DISTANCE. Entry of personnel into the area involving the spill of radioactive material should be limited to the shortest time possible, and the distance between the spillage and any personnel should be maximized. In addition, radiation contamination of personnel by inhalation, ingestion or skin contact should be of concern, and appropriate protective actions should be taken (protective clothing and self-contained breathing apparatus is recommended in all cases) (see SPILLAGE SCHEDULE S-S).

12.9 Corrosive substances – class 8

12.9.1 Corrosive solids and liquids can permanently damage human tissue. Some substances may corrode steel and destroy other materials (e.g. personal protection equipment). Corrosive vapours are highly toxic, often lethal by destroying lung tissue. All corrosive chemicals will be dangerous to human health (toxic). Avoid direct contact with the skin, protect against inhalation of vapours or mists. The use of self-contained breathing apparatus and appropriate chemical protection (e.g. chemical suit) is recommended in all cases. Washing spillages and forcing vapours overboard with water spray is the method in all cases. It is important to shut off, close and secure all ventilation leading into the accommodation of choice, machinery spaces and the bridge. All personnel should stay away from effluent (see SPILLAGE SCHEDULE S-B).

12.9.2 Some corrosive substances are also flammable. In these cases, the safety advice for both flammable and corrosive substances should be followed. Use of copious quantities of water and water spray is recommended. In general, the flammability hazard is more important than the corrosive properties for the safety of the ship and the crew (see e.g. SPILLAGE SCHEDULES S-C and S-G).

12.10 Miscellaneous dangerous substances and articles – class 9

12.10.1 This class contains miscellaneous dangerous substances that do not fit easily under the criteria for other hazard classes. Nonetheless, these substances represent hazards. There are no common properties that apply to all goods of this class. They have been allocated to the relevant EmS SPILLAGE SCHEDULE according to their hazards in the event of a spillage.

12.11 Marine pollutants

12.11.1 A number of substances within all classes have also been designated as marine pollutants because they are hazardous to marine life. Packages containing these substances will bear a Marine Pollutant mark.

12.11.2 In the case of spillage, it is important to be aware that any marine pollutant which is washed overboard will pollute the sea and must therefore be reported in accordance with the Reporting Procedures by the fastest telecommunication channel available with the highest possible priority to the nearest coastal State (see Reporting Procedures).

12.11.3 It is, however, more important to ensure the safety of the crew and the integrity of the laden ship, rather than to prevent pollution of the sea by marine pollutants.

General guidelines for SPILLAGE

- Think of safety first!
- Avoid any contact with dangerous substances. Do not walk through spilled liquids or dust (solids).
- Keep away from vapours or gases.
- Sound alarm.
- Keep the bridge and living quarters upwind if possible.
- Wear full protective clothing resistant to chemical attack and self-contained breathing apparatus.
- Locate stowage position of leaking cargo.
- Identify cargo.
- Obtain UN numbers and the EmS SPILLAGE SCHEDULE of dangerous goods involved.
- Consider which measures of the EmS SPILLAGE SCHEDULE are applicable and should be followed.
- Be prepared to use the Medical First Aid Guide (MFAG).
- Contact the designated person of the company responsible for the operation of the ship to obtain expert advice on dangerous goods emergency response measures.

Precaution: Contamination of the skin with any dangerous goods should be removed and washed immediately.

Emergency Schedules for SPILLAGE

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SPILLAGE SCHEDULE Alfa

S–A
TOXIC SUBSTANCES

General comments		Wear suitable protective clothing and self-contained breathing apparatus. Avoid contact, even when wearing protective clothing. Stop leak if practicable. Contaminated clothing should be washed off with water and then removed.
Spillage on deck	Packages (small spillage)	Wash overboard with copious quantities of water. Do not direct water jet straight onto the spillage. Keep clear of effluent. Clean the area thoroughly.
	Cargo Transport Units (large spillage)	Keep bridge and living quarters upwind. Wash overboard with copious quantities of water. Do not direct water jet straight onto the spillage. Keep clear of effluent. Clean the area thoroughly.
Spillage under deck	Packages (small spillage)	Do not enter space without self-contained breathing apparatus. Check atmosphere before entering (toxicity and explosion hazard). If atmosphere cannot be checked, do not enter. Let vapours evaporate. Keep clear. *Liquids:* Provide good ventilation of the space. Restrict flow of liquid to an enclosed area (e.g. by barricading with inert material or cement if available). *Solids:* Collect spillage. Dispose of overboard. Otherwise, keep clear. Radio for expert ADVICE.
	Cargo Transport Units (large spillage)	Keep clear. Radio for expert ADVICE. After hazard evaluation by experts, you may proceed. Provide adequate ventilation. Do not enter space without self-contained breathing apparatus. Check atmosphere before entering (toxicity and explosion hazard). If atmosphere cannot be checked, do not enter. Let vapour evaporate, keep clear. Where the ventilation system is used, particular attention should be taken to prevent toxic vapours or fumes entering occupied areas of the ship, e.g. living quarters, machinery spaces, working areas. *Liquids:* Provide good ventilation of the space. Wash down to the bottom of the hold. Pump overboard. *Solids*: Collect spillage. Keep spilt solids dry and cover with plastic sheet. Dispose of overboard. Otherwise, close hatches. Wait until the ship arrives in port.
Special cases: Marine Pollutant Mark UN 3546		Keep disposal overboard as low as possible. Dilute with copious quantities of water. Report incident according to MARPOL reporting requirements. Substances might be spilled when the articles are damaged. Undamaged articles can be collected

SPILLAGE SCHEDULE Bravo

S–B
CORROSIVE SUBSTANCES

General comments		Wear suitable protective clothing and self-contained breathing apparatus. Avoid contact, even when wearing protective clothing. Keep clear of effluent. Keep clear of evolving vapours. Even short-time inhalation of small quantities of vapour can cause breathing difficulties. Use of water on the substance may cause a violent reaction and produce toxic vapours. Substance may damage ship's construction materials. Contaminated clothing should be washed off with water and then removed.
Spillage on deck	Packages (small spillage)	Wash overboard with copious quantities of water. Do not direct water jet straight onto the spillage. Keep clear of effluent. Clean the area thoroughly.
	Cargo Transport Units (large spillage)	Keep bridge and living quarters upwind. Protect crew and living quarters against corrosive or toxic vapours by using water spray to drive vapours away. Wash overboard with copious quantities of water. Do not direct water jet straight onto the spillage. Keep clear of effluent. Clean the area thoroughly.
Spillage under deck	Packages (small spillage)	Provide adequate ventilation. Do not enter space without self-contained breathing apparatus. Check atmosphere before entering (toxicity and explosion hazard). If atmosphere cannot be checked, do not enter. Let vapour evaporate. Keep clear. *Liquids:* Provide good ventilation of the space. Wash down to the bottom of the hold. Use copious quantities of water. Pump overboard. *Solids:* Collect spillage. Dispose of overboard. Wash residues down to the bottom of the hold. Use copious quantities of water. Pump overboard.
	Cargo Transport Units (large spillage)	Keep bridge and living quarters upwind. Protect crew and living quarters against corrosive or toxic vapours by using water spray to drive vapours away. Do not enter space. Keep clear. Radio for expert ADVICE. After hazard evaluation by experts, you may proceed. Provide adequate ventilation. Do not enter space without self-contained breathing apparatus. Check atmosphere before entering (toxicity and explosion hazard). If atmosphere cannot be checked, do not enter. Let vapours evaporate, keep clear. Where a ventilation system is used, particular attention should be taken in order to prevent toxic vapours or fumes entering occupied areas of the ship, e.g. living quarters, machinery spaces, working areas. *Liquids:* Provide good ventilation of the space. Wash down to the bottom of the hold. Use copious quantities of water. Pump overboard. *Solids:* Collect spillage. Dispose of overboard. Wash residues down to the bottom of the hold. Use copious quantities of water. Pump overboard.
Special cases: Marine Pollutant Mark UN 2802, UN 2809, UN 3506 UN 3547		Report incident according to MARPOL reporting requirements. No reaction with water. Not highly corrosive to protective clothing. Collect spillages if practicable. Try to avoid disposal overboard. Radio for expert ADVICE. Substances might be spilled when the articles are damaged. Undamaged articles can be collected.

SPILLAGE SCHEDULE Charlie

S–C
FLAMMABLE, CORROSIVE LIQUIDS

General comments		Wear suitable protective clothing and self-contained breathing apparatus. Avoid contact, even when wearing protective clothing. Keep clear of effluent. Keep clear of evolving vapours. Even short-time inhalation of small quantities of vapour can cause breathing difficulties. Use of water on the substance may cause violent reaction and produce toxic vapours. Substance may damage the ship's construction materials. Spillage or reaction with water may evolve flammable vapours. Avoid all sources of ignition (e.g. naked lights, unprotected light bulbs, electric handtools, friction). Contaminated clothing must be washed off with water and then removed.
Spillage on deck	Packages (small spillage)	Wash overboard with copious quantities of water. Do not direct water jets straight onto the spillage. Keep clear of effluent. Clean the area thoroughly.
	Cargo Transport Units (large spillage)	Keep bridge and living quarters upwind. Protect crew and living quarters against corrosive or toxic vapours by using water spray to drive vapours away. Wash overboard with copious quantities of water. Do not direct water jets straight onto the spillage. Keep clear of effluent. Clean the area thoroughly.
Spillage under deck	Packages (small spillage)	Provide adequate ventilation. Do not enter deck without self-contained breathing apparatus. Check atmosphere before entering (toxicity and explosion hazard). If atmosphere cannot be checked, do not enter. Let vapours evaporate, keep clear. *Liquids:* Provide good ventilation of the space. Use water spray on effluent in hold to avoid ignition of flammable vapours. Wash down to the bottom of the hold. Use copious quantities of water. Pump overboard. *Solids:* Collect spillage. Dispose of overboard. Wash residues down to the bottom of the hold. Use copious quantities of water. Pump overboard.
	Cargo Transport Units (large spillage)	Keep bridge and living quarters upwind. Protect crew and living quarters against corrosive or toxic vapours by using water spray to drive vapours away. Do not enter space. Keep clear. Radio for expert ADVICE. After hazard evaluation by experts, you may proceed. Provide adequate ventilation. Do not enter space without self-contained breathing apparatus. Check atmosphere before entering (toxicity and explosion hazard). If atmosphere cannot be checked, do not enter. Let vapours evaporate, keep clear. Where a ventilation system is used, particular attention should be taken in order to prevent toxic vapours or fumes entering occupied areas of the ship, e.g. living quarters, machinery spaces, working areas. *Liquids:* Provide good ventilation of the space. Use water spray on effluent to avoid ignition of flammable vapours. Wash down to the bottom of the hold. Use copious quantities of water. Pump overboard. *Solids:* Collect spillage. Dispose of overboard. Wash residues down to the bottom of the hold. Use copious quantities of water. Pump overboard.
Special cases: Marine Pollutant Mark		Report incident according to MARPOL reporting requirements.
UN 2029, UN 3484		Self-ignition of spilt material is possible.

SPILLAGE SCHEDULE Delta

S–D
FLAMMABLE LIQUIDS

General comments		Wear suitable protective clothing and self-contained breathing apparatus. Avoid all sources of ignition (e.g. naked lights, unprotected light bulbs, electric handtools, friction). Stop leak if practicable. Avoid contact, even when wearing protective clothing. Spillage may evolve flammable vapours. Contaminated clothing must be washed off with water and then removed.
Spillage on deck	Packages (small spillage)	Wash overboard with copious quantities of water. Do not direct water jet straight onto the spillage. Keep clear of effluent. Clean the area thoroughly.
	Cargo Transport Units (large spillage)	Keep bridge and living quarters upwind. Wash overboard with copious quantities of water. Do not direct water jet straight onto the spillage. Keep clear of effluent. Clean the area thoroughly.
Spillage under deck	Packages (small spillage)	Shut off all possible sources of ignition in the space. Provide adequate ventilation. Do not enter space without self-contained breathing apparatus. Check atmosphere before entering (toxicity and explosion hazard). If the atmosphere cannot be checked, do not enter. Let vapours evaporate, keep clear. Provide good ventilation of the space. Use water spray on effluent in hold to avoid ignition of flammable vapours. Wash down to the bottom of the hold. Pump overboard.
	Cargo Transport Units (large spillage)	Keep bridge and living quarters upwind. Protect crew and living quarters against corrosive or toxic vapours by using water spray to drive vapours away. Do not enter space. Keep clear. Radio for expert ADVICE. After hazard evaluation by experts, you may proceed. Provide adequate ventilation. Do not enter space without self-contained breathing apparatus. Check atmosphere before entering (toxicity and explosion hazard). If atmosphere cannot be checked, do not enter. Let vapour evaporate, keep clear. Where a ventilation system is used, particular attention should be taken in order to prevent toxic vapours or fumes entering occupied areas of the vessel, e.g. living quarters, machinery spaces, working areas. Provide good ventilation of the space. Use water spray on effluent in the space to avoid ignition of flammable vapours. Wash down to the bottom of the hold. Use copious quantities of water. Pump overboard.
Special cases:		
Marine Pollutant Mark		Report incident according to MARPOL reporting requirements.
UN 2749		Self-ignition of spilt material is possible.
UN 3359		This is a cargo transport unit under fumigation. When opened, it will be ventilated. However, experience has shown that toxic fumigants will stay within packaging material and in non-ventilated areas. Obtain information about the fumigation agent.
UN 3540		Substances might be spilled when the articles are damaged. Undamaged articles can be collected and repacked.

SPILLAGE SCHEDULE Echo

S–E
FLAMMABLE LIQUIDS, FLOATING ON WATER

General comments		Avoid sources of ignition (e.g. naked lights, unprotected light bulbs, electric handtools). Liquid is flammable and spillage may evolve flammable vapours. Wear suitable protective clothing and self-contained breathing apparatus. Stop leak if practicable. In general, substances covered under this schedule will have fuel-oil-like properties. They are immiscible with water and are liable to float on the surface of water. The use of inert absorbent material, as used in machinery spaces, is appropriate in all cases. For sticky liquids, shovels may be used, preferably shovels made of non-sparking or non-ferrous material. You may use light oil or soap-like products (surfactants) to clean small areas. Clean the area thoroughly because of the flammability hazard. Any pumping of spilled liquid overboard will create an oil spill on the sea surface. In this case, contact coastal authorities. Report discharge overboard according to MARPOL reporting requirements.
Spillage on deck	Packages (small spillage)	Collect spillage in oil drums, metal boxes or salvage packagings. You may use inert absorbent material.
	Cargo Transport Units (large spillage)	Restrict flow of leakage to an enclosed area (e.g. by diking with inert material or cement). Collect spillage in oil drums, metal boxes or salvage packagings. You may use inert absorbent material. Otherwise, wash overboard with copious quantities of water.
Spillage under deck	Packages (small spillage)	Shut off possible sources of ignition in the space. Provide adequate ventilation. Do not enter space without self-contained breathing apparatus. Check atmosphere before entering (toxicity and explosion hazard). If atmosphere cannot be checked, do not enter. Let vapours evaporate. Collect spillage in oil drums, metal boxes or salvage packagings. You may use inert absorbent material. Keep collected spillages in well ventilated areas or on deck only.
	Cargo Transport Units (large spillage)	Shut off possible sources of ignition in the space. Provide adequate ventilation. Do not enter deck without self-contained breathing apparatus. Check atmosphere before entering (toxicity and explosion hazard). If atmosphere cannot be checked, do not enter. Let vapours evaporate. Where a ventilation system is used, particular attention should be taken in order to prevent toxic vapours or fumes entering occupied areas of the ship, e.g. living quarters, machinery spaces, working areas. Provide good ventilation of the space. Use water spray on effluent in the space to avoid ignition of flammable vapours. Wash down to the bottom of the hold. Use copious quantities of water. Treat effluent according to Shipboard Oil Pollution Emergency Plan. Otherwise, radio for expert ADVICE.
Special cases:		
UN 1136, UN 1993		These substances may be miscible with water and hence not float on the surface. In this case, SPILLAGE SCHEDULE S–D will be appropriate.
UN 1139, UN 1263, UN 1866		No thorough cleaning of spillage site necessary. Residues will dry out and coat surfaces.

SPILLAGE SCHEDULE Foxtrot

S–F
WATER-SOLUBLE MARINE POLLUTANTS

General comments		Wear suitable protective clothing and self-contained breathing apparatus. Stop leak if practicable. Substances covered under this schedule will present a hazard to the marine environment. Try to avoid disposal overboard. The use of inert absorbent material, as used in machinery spaces, is appropriate in all cases. For sticky liquids, shovels may be used. Discharge of spilled substance overboard will damage the marine environment, including living resources of the sea. In this case, contact coastal authorities. Report discharge overboard according to MARPOL reporting requirements.
Spillage on deck	Packages (small spillage)	*Liquids:* Smother spillage with inert absorbent material. Collect spillage in oil drums, metal boxes or salvage packagings. *Solids:* Collect material.
	Cargo Transport Units (large spillage)	Restrict flow of leakage to an enclosed area (e.g. by barricading with inert material or cement if available). *Liquids:* Collect spillage in empty tanks, oil drums, metal boxes or salvage packagings. You may use inert absorbent material. *Solids:* Collect spillage in oil drums or metal boxes.
Spillage under deck	Packages (small spillage)	*Liquids:* Smother spillage with inert absorbent material. Collect spillage in oil drums, metal boxes or salvage packagings. *Solids:* Collect material.
	Cargo Transport Units (large spillage)	Restrict flow of leakage to an enclosed area (e.g. by barricading with inert material or cement if available). *Liquids:* Collect spillage in empty tanks, oil drums, metal boxes or salvage packagings. You may use inert absorbent material. *Solids:* Collect spillage in oil drums or metal boxes. Otherwise, wash down to the bottom of the hold. Use copious quantities of water. Treat effluent according to Shipboard Oil Pollution Emergency Plan.
Special cases: None.		

SPILLAGE SCHEDULE Golf

S–G
FLAMMABLE SOLIDS AND SELF-REACTIVE SUBSTANCES

General comments		Wear suitable protective clothing and self-contained breathing apparatus. Avoid all sources of ignition (e.g. naked lights, unprotected light bulbs, electric handtools, friction). Wear non-sparking footwear. Stop leak if practicable.
Spillage on deck	Packages (small spillage)	Wash overboard with copious quantities of water. Keep clear of effluent.
	Cargo Transport Units (large spillage)	
Spillage under deck	Packages (small spillage)	Do not enter space without self-contained breathing apparatus. Check atmosphere before entering (toxicity and explosion hazard). Collect and contain spillage if practicable. Dispose of overboard. Collect spillage using soft brushes and plastic trays.
	Cargo Transport Units (large spillage)	Provide adequate ventilation. Do not enter space without self-contained breathing apparatus. Check atmosphere before entering (toxicity and explosion hazard). Collect and contain spillage if practicable. Dispose of overboard. Collect spillage using soft brushes and plastic trays.
Special cases: UN 3541		Substances might be spilled when the articles are damaged. Undamaged articles can be collected.

SPILLAGE SCHEDULE Hotel

S–H
FLAMMABLE SOLIDS (MOLTEN MATERIAL)

<table>
<tr><td colspan="2">General comments</td><td>Wear suitable protective clothing and self-contained breathing apparatus.
Avoid all sources of ignition (e.g. naked lights, unprotected light bulbs, electric handtools, friction). Wear non-sparking footwear.
Stop leak if practicable.
Do not touch or walk on spilled material.</td></tr>
<tr><td rowspan="2">Spillage on deck</td><td>Packages (small spillage)</td><td rowspan="4">Smother with dry inert material. Dispose of overboard.</td></tr>
<tr><td>Cargo Transport Units (large spillage)</td></tr>
<tr><td rowspan="2">Spillage under deck</td><td>Packages (small spillage)</td></tr>
<tr><td>Cargo Transport Units (large spillage)</td></tr>
<tr><td colspan="3">Special cases: None.</td></tr>
</table>

SPILLAGE SCHEDULE India

S–I
FLAMMABLE SOLIDS (REPACKING POSSIBLE)

General comments		Wear suitable protective clothing and self-contained breathing apparatus. Avoid all sources of ignition (e.g. naked lights, unprotected light bulbs, electric handtools, friction). Wear non-sparking footwear. Stop leak if practicable.
Spillage on deck	Packages (small spillage)	Collect spillage and repack if practicable. Otherwise, wash overboard with copious quantities of water. Keep clear of effluent.
	Cargo Transport Units (large spillage)	
Spillage under deck	Packages (small spillage)	Collect spillage and repack if practicable.
	Cargo Transport Units (large spillage)	
Special cases: None.		

SPILLAGE SCHEDULE Juliet

S–J
WETTED EXPLOSIVES AND CERTAIN SELF-HEATING SUBSTANCES

General comments		Wear suitable protective clothing and self-contained breathing apparatus. Avoid all sources of ignition (e.g. naked lights, unprotected light bulbs, electric handtools, friction). Wear non-sparking footwear. Stop leak if practicable. Dried out material may explode if exposed to heat, flame, friction, or shock.
Spillage on deck	Packages (small spillage)	Keep spillage wet. Dispose of solid material overboard. Wash overboard with copious quantities of water. Keep clear of effluent.
	Cargo Transport Units (large spillage)	
Spillage under deck	Packages (small spillage)	Keep spillage wet. Collect and contain spillage if practicable. Dispose of overboard. Collect spillage using soft brushes and plastic trays.
	Cargo Transport Units (large spillage)	
Special cases: UN 3542		Substances might be spilled when the articles are damaged. Undamaged articles can be collected.

SPILLAGE SCHEDULE Kilo

S–K
TEMPERATURE-CONTROLLED SELF-REACTIVE SUBSTANCES

General comments		If smoke is observed, see FIRE SCHEDULE F-F. Check temperature reading if possible. If temperature is increasing: see FIRE SCHEDULE F-F. Wear suitable protective clothing and self-contained breathing apparatus. Avoid all sources of ignition (e.g. naked lights, unprotected light bulbs, electric handtools, friction). Wear non-sparking footwear.
Spillage on deck	Packages (small spillage)	Wash overboard with copious quantities of water. Keep clear of effluent.
	Cargo Transport Units (large spillage)	Wash overboard with copious quantities of water. Keep clear of effluent. Leave units closed.
Spillage under deck	Packages (small spillage)	Not applicable. According to the IMDG Code, under deck stowage not allowed. Radio for expert ADVICE.
	Cargo Transport Units (large spillage)	
Special cases: None.		

SPILLAGE SCHEDULE Lima

S–L
SPONTANEOUSLY COMBUSTIBLE, WATER-REACTIVE SUBSTANCES

General comments		Wear suitable protective clothing and self-contained breathing apparatus. Avoid all sources of ignition (e.g. naked lights, unprotected light bulbs, electric handtools, friction). Wear non-sparking footwear. DO NOT USE WATER.
Spillage on deck	Packages (small spillage)	Avoid getting water on spilled substances or inside cargo transport units. Smother with dry inert material. Dispose of overboard immediately.
	Cargo Transport Units (large spillage)	
Spillage under deck	Packages (small spillage)	Not applicable. According to the IMDG Code, under deck stowage not allowed. Radio for expert ADVICE.
	Cargo Transport Units (large spillage)	
Special cases: UN 2210, UN 2968		These substances are allowed to be carried under deck. Take action as given for on deck stowage.

SPILLAGE SCHEDULE Mike

S–M
HAZARD OF SPONTANEOUS IGNITION

<table>
<tr><td colspan="2">General comments</td><td rowspan="5">Substances covered by this schedule may ignite within 5 minutes after contact with air.
See firefighting guidance: FIRE SCHEDULE F–G.</td></tr>
<tr><td rowspan="2">Spillage on deck</td><td>Packages (small spillage)</td></tr>
<tr><td>Cargo Transport Units (large spillage)</td></tr>
<tr><td rowspan="2">Spillage under deck</td><td>Packages (small spillage)</td></tr>
<tr><td>Cargo Transport Units (large spillage)</td></tr>
<tr><td colspan="2">Special cases:
UN 3542</td><td>Substances might be spilled when the articles are damaged.
Undamaged articles can be collected.</td></tr>
</table>

SPILLAGE SCHEDULE November

S–N
SUBSTANCES REACTING VIGOROUSLY WITH WATER

General comments		Wear suitable protective clothing and self-contained breathing apparatus. Avoid all sources of ignition (e.g. naked lights, unprotected light bulbs, electric handtools, friction). Wear non-sparking footwear. Stop leak if practicable.
Spillage on deck	Packages (small spillage)	If dry, contain and collect spillage if practicable. Dispose of overboard. Avoid contact with water except to wash residues overboard with copious quantities of water. Keep clear of effluent.
	Cargo Transport Units (large spillage)	
Spillage under deck	Packages (small spillage)	Provide adequate ventilation. Check atmosphere before entering space (toxicity and explosion hazards). If atmosphere cannot be checked, do not enter. Do not enter space without self-contained breathing apparatus. Keep dry. Collect spillages using soft brushes and plastic trays. *If dry*, collect and contain spillage if practicable. Dispose of overboard. *If wet*, use inert absorbent material. Do not use combustible material. Dispose of overboard.
	Cargo Transport Units (large spillage)	
Special cases: UN 3544		Substances might be spilled when the articles are damaged. Undamaged articles can be collected

SPILLAGE SCHEDULE Oscar

S–O
SUBSTANCES DANGEROUS WHEN WET (NON-COLLECTABLE ARTICLES)

General comments		Wear suitable protective clothing and self-contained breathing apparatus. Avoid all sources of ignition (e.g. naked lights, unprotected light bulbs, electric handtools, friction). Wear non-sparking footwear. Stop leak if practicable.
Spillage on deck	Packages (small spillage)	Wash overboard with copious quantities of water. Keep clear of effluent.
	Cargo Transport Units (large spillage)	
Spillage under deck	Packages (small spillage)	Do not enter space without self-contained breathing apparatus. *If dry*, collect and contain spillage if practicable. Keep dry. Dispose of overboard. Avoid contact with water except to wash residues with copious quantities of water. Keep clear of effluent. *If wet*, wash down to the bottom of the hold. Use copious quantities of water. Pump overboard. If gas is developing, provide good ventilation of the hold. Use water spray on effluent in hold to avoid ignition of flammable vapours.
	Cargo Transport Units (large spillage)	Do not enter space without self-contained breathing apparatus. *If dry*, collect and contain spillage if practicable. Keep dry. Dispose of overboard. Avoid contact with water except to wash residues with copious quantities of water. Keep clear of effluent. *If wet*, wash down to the bottom of the hold. Use copious quantities of water. Pump overboard. If gas is developing, provide good ventilation of the hold. Use water spray on effluent in hold to avoid ignition of flammable vapours. Where a ventilation system is used, particular attention should be taken in order to prevent toxic vapours or fumes entering occupied spaces of the ship, e.g. living quarters, machinery spaces, working areas.
Special cases: UN 1295		Beware of a highly flammable atmosphere.

SPILLAGE SCHEDULE Papa

S–P
SUBSTANCES DANGEROUS WHEN WET (COLLECTABLE ARTICLES)

General comments		Wear suitable protective clothing and self-contained breathing apparatus.
Spillage on deck	Packages (small spillage)	Contain and collect spillage if practicable. Dispose of overboard.
	Cargo Transport Units (large spillage)	
Spillage under deck	Packages (small spillage)	Provide adequate ventilation. Do not enter space without self-contained breathing apparatus. Contain and collect spillages if practicable. Dispose of overboard.
	Cargo Transport Units (large spillage)	
Special cases:		
UN 3257, UN 3258		Hot substance. No hazard when cool.
UN 3316		If FIRST AID KIT, collect articles and repack.
UN 3363, UN 3548		Substances might be spilled when the articles or machinery are damaged. Undamaged articles can be collected. Take care of hazardous properties according to transport documents or radio for expert ADVICE.

SPILLAGE SCHEDULE Quebec

S–Q
OXIDIZING SUBSTANCES

General comments		Wear suitable protective clothing and self-contained breathing apparatus. Avoid all sources of ignition (e.g. naked lights, unprotected light bulbs, electric handtools, friction). Wear non-sparking footwear. May ignite combustible material (e.g. wood, paper, clothing). Stop leak if practicable.
Spillage on deck	Packages (small spillage)	Wash overboard with copious quantities of water. Keep clear of effluent.
	Cargo Transport Units (large spillage)	
Spillage under deck	Packages (small spillage)	Do not enter space without self-contained breathing apparatus. *If dry*, contain and collect spillage if practicable. Dispose of overboard. *If wet*, use inert absorbent material. Do not use combustible material. *If liquid*, wash down to the bottom of the hold, using copious quantities of water. Pump overboard. Dispose of overboard.
	Cargo Transport Units (large spillage)	Provide adequate ventilation. Do not enter space without self-contained breathing apparatus. *If dry*, contain and collect spillage if practicable. Dispose of overboard. *If wet*, use inert absorbent material. Do not use combustible material. *If liquid*, wash down to the bottom of the hold, using copious quantities of water. Pump overboard. Dispose of overboard.
Special cases: None.		

SPILLAGE SCHEDULE Romeo

S–R
ORGANIC PEROXIDES

General comments		Wear suitable protective clothing and self-contained breathing apparatus. Contact of substance (or vapour) with eyes may cause blindness within minutes. Avoid all sources of ignition (e.g. naked lights, unprotected light bulbs, electric handtools, friction). Wear non-sparking footwear. Stop leak if practicable. Substances covered by this schedule are liable to explode by exposure to heat or ignition. In case of *smoke evolution*, see appropriate FIRE SCHEDULE. Radio for expert ADVICE or contact manufacturer.
Spillage on deck	Packages (small spillage)	Wash overboard with copious quantities of water. Keep clear of effluent. Collect damaged or leaking receptacles and dispose of overboard. Handle with care.
	Cargo Transport Units (large spillage)	
Spillage under deck	Packages (small spillage)	Not applicable. According to the IMDG Code, under deck stowage not allowed. Radio for expert ADVICE.
	Cargo Transport Units (large spillage)	
Special cases: UN 3545		Substances might be spilled when the articles are damaged. Undamaged articles can be collected.

SPILLAGE SCHEDULE Sierra (Part 1 of 2)

S–S
RADIOACTIVE MATERIAL

General comments		Evacuate compartment or downwind area of non-essential personnel. Provide respiratory protection to personnel in downwind area. For ships carrying radiation monitoring equipment, measure radiation levels. In this case, assess the extent of contamination and resultant radiation level of the package, the adjacent areas and, if necessary, all other material which has been carried in the conveyance. Define a zone for restricted entry. Personnel should not enter this zone without suitable protective clothing and self-contained breathing apparatus. Limit entry of personnel to the restricted zone for the shortest time possible. Cover liquid spill with inert absorbent materials, if available. Cover powder spills with plastic sheet or tarpaulin to minimize spread. If exposure of personnel is suspected, clean body and hair with warm water and soap; discharge resultant washings directly overboard. Record the names of potentially exposed persons. Ensure medical examination of these persons after reaching any medical staff. Emergency procedures, if established for the ship or the specific cargo by relevant authorities or the shipper, should be followed. For ships carrying radiation monitoring equipment, continue monitoring the radiation levels. Radio for expert ADVICE.
Spillage on deck	Packages (small spillage)	Wash spillages overboard with copious quantities of water. Keep clear of effluent. Packages damaged or leaking radioactive contents may be removed to an acceptable restricted access interim location. Isolate and sheet over. Do not remove packages from restricted access zone until approved by the competent authority.
	Cargo Transport Units (large spillage)	Let released gas escape. Keep clear. Use water spray to protect bridge, living quarters and personnel from precipitation of vapours (water curtain). Absorb liquid spillage, where practicable, using absorbent material. Isolate and sheet over. Packages damaged or leaking radioactive contents may be removed to an acceptable restricted access interim location. Isolate and sheet over. Do not remove packages from restricted access zone until approved by the competent authority. Wash residues of liquids or solids overboard with copious quantities of water (use spray nozzles). Do not allow water to enter receptacles.
Spillage under deck	Packages (small spillage)	Provide adequate ventilation. Let released gas escape, keep clear. Where a ventilation system is used, particular attention should be taken in order to prevent radioactive vapours or fumes entering occupied areas of the ship, e.g. living quarters, machinery spaces, working areas. Keep solids dry. Absorb liquid spillage, where practicable, using inert absorbent material. Isolate and sheet over. Packages damaged or leaking radioactive contents may be removed to an acceptable restricted access interim location. Isolate and sheet over. Do not remove packages from restricted access zone until approved by the competent authority. Keep working period of emergency team in space as short as possible.
	Cargo Transport Units (large spillage)	Do not enter space. Radio for expert ADVICE. *If liquid, or vapour is developing:* Where a ventilation system is used, particular attention should be taken in order to prevent radioactive vapours entering occupied areas of the ship, e.g. living quarters, machinery spaces, working areas. Use water spray to protect bridge, living quarters and personnel from precipitation of vapours evolving from the hold (water curtain).

SPILLAGE SCHEDULE Sierra *(continued)* (Part 2 of 2)

S–S
RADIOACTIVE MATERIAL

Special cases: UN 2977, UN 2978, UN 3507	Avoid contact, even when wearing protective clothing. Keep clear of evolving vapours. Even short-time inhalation of small quantities of vapour can cause breathing difficulties. Bear in mind that gases are heavier than air. Measures should be taken to prevent leaking gases from penetrating into any other part of the ship. Keep bridge and living quarters upwind. Protect crew and living quarters against corrosive and toxic vapours by using water spray to drive vapours away. Do not enter space without protective equipment. Keep clear. Radio for expert ADVICE.
UN 2919, UN 3331	For radioactive material, *transported under special arrangement*, use special precautions, operational controls or emergency procedures as specifically designated by the competent authorities in their approval certificates and declared by the shipper in its transport documents.
Subsidiary labels class 4.2 or class 4.3	These are pyrophoric substances, water will ignite the material. DO NOT USE WATER. Radio for expert ADVICE.
Restowing of packages UN 2977, UN 3324, UN 3325, UN 3326, UN 3327, UN 3328, UN 3329, UN 3330, UN 3331	Check package labels and transport documents to determine whether packages contain fissile material. Prior to any restowing of these packages, radio for expert ADVICE.

SPILLAGE SCHEDULE Tango

S–T
DANGEROUS GOODS WITH BIOHAZARD

<table>
<tr><td colspan="2">General comments</td><td>Wear suitable protective clothing and self-contained breathing apparatus.
Avoid handling leaking or damaged packages or keep handling to a minimum.
Inform the public health, veterinary or other competent authority if persons or the marine environment might have been exposed. A competent authority to which actual or suspected leakage is reported should notify the authorities of any countries in which the goods may have been handled, including countries of transit.
Radio for expert ADVICE.
Notify consignor/consignee.</td></tr>
<tr><td rowspan="2">Spillage on deck</td><td>Packages (small spillage)</td><td rowspan="2">Stop leak if practicable.
Collect potentially contaminated packages or equipment. Isolate and sheet over.
Wash spillage or residues overboard with copious quantities of water. Keep clear of effluent.
Clean contaminated area thoroughly using bleach-like products (like sodium hypochlorite 1–6% solution or Javel water). Keep clear of effluent.</td></tr>
<tr><td>Cargo Transport Units (large spillage)</td></tr>
<tr><td rowspan="2">Spillage under deck</td><td>Packages (small spillage)</td><td rowspan="2">Do not enter space.</td></tr>
<tr><td>Cargo Transport Units (large spillage)</td></tr>
<tr><td colspan="3">Special cases: None.</td></tr>
</table>

SPILLAGE SCHEDULE Uniform (Part 1 of 2)

S–U
GASES (FLAMMABLE, TOXIC OR CORROSIVE)

General comments		Spaces and areas where leakages or spillages have occurred should be evacuated downwind immediately. Take care: Flames may be invisible. Leaking gas may be extremely cold. Measures should be taken to prevent leaking gases from penetrating into any other part of the ship. Bear in mind that some gases are heavier than air or may otherwise accumulate in lower or non-ventilated parts of the ship. Ensure that there is no smoking or any other open fire on board unless the leak has been closed and all spaces have been ventilated. Particular attention should be taken in order to prevent gases drifting into occupied areas of the ship, e.g. living quarters, machinery spaces, working areas. Wear protective clothing suitable for gas protection and self-contained breathing apparatus. Avoid all sources of ignition (e.g. naked lights, unprotected light bulbs, electric handtools, friction). Wear non-sparking footwear. Even short inhalation of small quantities of gas can cause breathing difficulties. Keep clear of evolving gases. Avoid all skin contact. Let *spilt liquefied gas* evaporate. When in contact with cold liquefied gases, most materials become brittle and are likely to break without warning. Avoid all contact, even when wearing protective clothing. If practicable, protect ship's superstructure with copious quantities of water. Do not direct water jet onto the spill.
Spillage on deck	Packages (small spillage)	Let gas dissipate. Keep clear.
	Cargo Transport Units (large spillage)	Let gas dissipate. Keep bridge and living quarters upwind. Otherwise, protect crew and living quarters against flammable or toxic gases by using water spray to drive gases away (water curtain). *Spilt liquefied gas:* Use water jets from as far as practicable to accelerate evaporation, not directing them straight onto the spill.
Spillage under deck	Packages (small spillage)	Do not enter space. Provide adequate ventilation. Where a ventilation system is used, particular attention should be taken in order to prevent gases penetrating into other areas of the ship. Let gas evaporate. Keep clear. Radio for expert ADVICE. Check atmosphere before entering (toxicity and explosion hazard). Do not enter space without self-contained breathing apparatus.
	Cargo Transport Units (large spillage)	Do not enter space. Provide adequate ventilation. Where a ventilation system is used, particular attention should be taken in order to prevent gases drifting into other areas of the ship. Keep bridge and living quarters upwind. Otherwise, protect crew and living quarters against flammable or toxic gases by using water spray to drive gases away (water curtain). If practicable, use water spray to avoid ignition of flammable gases in the space. Radio for expert ADVICE. Check atmosphere before entering (toxicity and explosion hazard). Do not enter deck without self-contained breathing apparatus.

SPILLAGE SCHEDULE Uniform *(confirmed)* (Part 2 of 2)

S–U
GASES (FLAMMABLE, TOXIC OR CORROSIVE)

Special cases:	
UN 1001, UN 3374	Heated or roughly handled receptacles may explode even after several hours of being removed from external sources of heat. Cool for several hours by using water. Also consult SPILLAGE SCHEDULES S-D, S-G or S-A, as appropriate.
UN 1614	The gas is absorbed in a porous inert material, but will evaporate if the receptacle is damaged.
UN 3501	A flammable liquid, paste or powder may be expelled if the package is ruptured. Also consult SPILLAGE SCHEDULES S-D or S-G, as appropriate.
UN 3504	A flammable or toxic liquid, paste or powder may be expelled if the package is ruptured.
UN 3505	A flammable or corrosive liquid, paste or powder may be expelled if the package is ruptured. Also consult SPILLAGE SCHEDULES S-C or S-G, as appropriate.
UN 3537, UN 3539	Gases might be released when the articles are damaged. Undamaged articles can be collected and repacked.

SPILLAGE SCHEDULE Victor

S–V
GASES (NON-FLAMMABLE, NON-TOXIC)

General comments		Measures should be taken to prevent leaking gases from penetrating into any other part of the ship. Bear in mind that some gases are heavier than air or may otherwise accumulate in lower or non-ventilated parts of the ship. Particular attention should be taken in order to prevent gases drifting into occupied areas of the ship, e.g. living quarters, machinery spaces, working areas. Leaking gas may be extremely cold. Wear suitable protective clothing and self-contained breathing apparatus (suffocation hazard). Let *spilt liquefied gas* evaporate. When in contact with cold liquefied gases, most materials become brittle and are likely to break without warning. Avoid all contact, even when wearing protective clothing. If practicable, protect ship's superstructure with copious quantities of water. Do not direct water jet onto the spill.
Spillage on deck	Packages (small spillage)	Let gas dissipate. Keep clear.
	Cargo Transport Units (large spillage)	Let gas dissipate. *Spilt liquefied gas:* Use water jets from as far as practicable to accelerate evaporation, not directing them straight onto the spill. Keep clear of evolving gases.
Spillage under deck	Packages (small spillage)	Provide adequate ventilation. Stop leak if practicable. Otherwise, let gas evaporate. Keep clear. Check atmosphere before entering space (suffocation hazard). Do not enter space without self-contained breathing apparatus.
	Cargo Transport Units (large spillage)	Provide adequate ventilation. Stop leak if practicable. Otherwise, let gas evaporate. Keep clear. *Spilt liquefied gas:* Use water jets from as far as practicable to accelerate evaporation, not directing them straight onto the spill. Check atmosphere before entering space (suffocation hazard). Do not enter space without self-contained breathing apparatus.
Special cases:		
UN 2990, UN 3072		No suffocation hazard. Collect articles and repack.
UN 3502		A toxic liquid, paste or powder may be expelled if the package is ruptured. Also consult SPILLAGE SCHEDULE S-A.
UN 3503		A corrosive liquid, paste or powder may be expelled if the package is ruptured. Also consult SPILLAGE SCHEDULES S-C or S-G, as appropriate.
UN 3538		Gases might be released when the articles are damaged. Undamaged articles can be collected and repacked.

SPILLAGE SCHEDULE Whisky

S–W
OXIDIZING GASES

General comments		Areas containing leakages or spillages should be evacuated downwind immediately. These gases may ignite combustible material and enhance fire. Take care: Flames may be invisible. Leaking gas may be extremely cold. Measures should be taken to prevent leaking gases from penetrating into any other part of the ship. Ensure that there is no smoking or any other open fire on board unless the leak has been closed and all spaces have been ventilated. Particular attention should be taken in order to prevent gases drifting into occupied areas of the vessel, e.g. living quarters, machinery spaces, working areas. Wear suitable protective clothing and self-contained breathing apparatus. Avoid all sources of ignition (e.g. naked lights, unprotected light bulbs, electric handtools, friction). Wear non-sparking footwear. Even short inhalation of small quantities of gas can cause breathing difficulties. Keep clear of evolving gases. Avoid all skin contact. Let *spilt liquefied gas* evaporate. When in contact with cold liquefied gases, most materials become brittle and are likely to break without warning. Avoid all contact, even when wearing protective clothing. If practicable, protect ship's superstructure with copious quantities of water. Do not direct water jet onto the spill.
Spillage on deck	Packages (small spillage)	Let gas evaporate. Keep clear.
	Cargo Transport Units (large spillage)	Let gas evaporate. Keep bridge and living quarters upwind. Otherwise, protect crew and living quarters against flammable or toxic gases by using water spray to drive gases away (water curtain). *Spilt liquefied gas:* Use water jets from as far as practicable to accelerate evaporation, not directing them straight onto the spill.
Spillage under deck	Packages (small spillage)	Do not enter space. Provide adequate ventilation. Where a ventilation system is used, particular attention should be observed in order to prevent gases penetrating into other areas of the ship. Let gas evaporate. Keep clear. Radio for expert ADVICE. Check atmosphere before entering space (toxicity and explosion hazard). Do not enter space without self-contained breathing apparatus.
	Cargo Transport Units (large spillage)	Do not enter space. Provide adequate ventilation. Where a ventilation system is used, particular attention should be observed in order to prevent gases drifting into other areas of the ship. Keep bridge and living quarters upwind. Otherwise, protect crew and living quarters against gases by using water spray to drive gases away (water curtain). If practicable, use water spray to avoid ignition of gases in the space. Radio for expert ADVICE.
Special cases: UN 1072, UN 1073		This is concentrated oxygen. No inhalation hazard after a short distance from a leak. No skin irritation hazard.

SPILLAGE SCHEDULE X-Ray

S–X
EXPLOSIVE ITEMS AND ARTICLES

<table>
<tr><td colspan="2">General comments</td><td>Avoid all sources of ignition (e.g. naked lights, unprotected light bulbs, electric handtools).
Electrostatic hazard: Electric charge may ignite ammunition. Keep spilled material away from generators of static electricity (e.g. mobile phones, friction of synthetic polymers like PVC gloves). Wear non-sparking footwear.</td></tr>
<tr><td rowspan="2">Spillage on deck</td><td>Packages (small spillage)</td><td rowspan="2">*Articles:* Sweep or pick up articles. If the articles remain intact but appear damaged, separate out and radio for expert ADVICE.
Spilled substance: Keep wet. Wash spillage overboard with copious quantities of water.</td></tr>
<tr><td>Cargo Transport Units (large spillage)</td></tr>
<tr><td rowspan="2">Spillage under deck</td><td>Packages (small spillage)</td><td rowspan="2">*Articles:* Sweep or pick up articles. If the articles remain intact but appear damaged, separate and radio for expert ADVICE.
Spilled substance: Keep wet. Collect spillage where practicable. Dispose of overboard.</td></tr>
<tr><td>Cargo Transport Units (large spillage)</td></tr>
<tr><td colspan="3">Special cases: None.</td></tr>
</table>

SPILLAGE SCHEDULE Yankee

S–Y
EXPLOSIVE CHEMICALS

<table>
<tr><td colspan="2">General comments</td><td>Avoid all sources of ignition (e.g. naked lights, unprotected light bulbs, electric handtools).
Stop leak if practicable.
Electrostatic hazard: Electric charge may ignite ammunition. Keep spilled material away from generators of static electricity (e.g. mobile phones, friction of synthetic polymers like PVC gloves). Wear non-sparking footwear.
Some explosive mixtures are stabilized in such a way that water will separate explosives from the stabilizer, thus creating a higher risk. The explosive component becomes very sensitive to shock and heat.
Radio for expert ADVICE.</td></tr>
<tr><td rowspan="2">Spillage on deck</td><td>Packages (small spillage)</td><td rowspan="2">Articles: Sweep or pick up articles. If the articles remain intact but appear damaged, separate out and ask for expert ADVICE. Wetted articles should be jettisoned.
Spilled substance: Keep it under water. Wash spillages overboard with copious quantities of water.</td></tr>
<tr><td>Cargo Transport Units (large spillage)</td></tr>
<tr><td rowspan="2">Spillage under deck</td><td>Packages (small spillage)</td><td rowspan="2">Articles: Sweep or pick up articles. If the articles remain intact but appear damaged, separate out and radio for expert ADVICE. Wetted articles should be jettisoned.
Spilled substance: Keep it under water. Collect spillages where practicable. Dispose of overboard.</td></tr>
<tr><td>Cargo Transport Units (large spillage)</td></tr>
<tr><td colspan="3">Special cases: None.</td></tr>
</table>

SPILLAGE SCHEDULE Zulu

S–Z
TOXIC EXPLOSIVES

General comments		Wear suitable protective clothing and self-contained breathing apparatus. Even short inhalation of small quantities of gas can cause breathing difficulties or lead to severe poisoning. Avoid all sources of ignition (e.g. naked lights, unprotected light bulbs, electric handtools). *Electrostatic hazard:* Electric charge may ignite ammunition. Keep spilled material away from generators of static electricity (e.g. mobile phones, friction of synthetic polymers like PVC gloves). Wear non-sparking footwear. Particular attention should be taken in order to prevent developing gases drifting into occupied areas of the ship, e.g. living quarters, machinery, working areas. Keep bridge and living quarters upwind. Otherwise, protect crew and living quarters against gases by using water spray to drive gases away (water curtain). Radio for expert ADVICE.
Spillage on deck	Packages (small spillage)	Let vapours dissipate, keep clear. *Articles:* Sweep or pick up articles. If the articles remain intact but appear damaged, separate out and ask for expert ADVICE.
	Cargo Transport Units (large spillage)	*Spilled substance:* Keep wet. Wash spillage overboard with copious quantities of water. Keep clear of effluent.
Spillage under deck	Packages (small spillage)	Do not enter space without self-contained breathing apparatus. Check atmosphere before entering. Let vapours dissipate, keep clear. *Articles:* Sweep or pick up articles. If the articles remain intact but appear damaged, separate out and ask for expert ADVICE.
	Cargo Transport Units (large spillage)	*Spilled substance:* Keep wet. Collect spillages where practicable. Dispose of overboard.
Special cases: None.		

Index

Each current UN substance identification number (UN number) is allocated to EmS Fire and Spillage Schedules as shown below. Underlined EmS codes (special cases) indicate a substance, material or article for which additional advice is given in the emergency response procedures.

UN No.	EmS Fire	EmS Spill	UN No.	EmS Fire	EmS Spill	UN No.	EmS Fire	EmS Spill
0004	F-B	S-Y	0066	F-B	S-X	0135	F-B	S-Y
0005	F-B	S-X	0070	F-B	S-X	0136	F-B	S-X
0006	F-B	S-X	0072	F-B	S-Y	0137	F-B	S-X
0007	F-B	S-X	0073	F-B	S-X	0138	F-B	S-X
0009	F-B	S-X	0074	F-B	S-Y	0143	F-B	S-Z
0010	F-B	S-X	0075	F-B	S-Y	0144	F-B	S-Y
0012	F-B	S-X	0076	F-B	S-Z	0146	F-B	S-Y
0014	F-B	S-X	0077	F-B	S-Z	0147	F-B	S-Y
0015	F-B	S-X	0078	F-B	S-Y	0150	F-B	S-Y
0016	F-B	S-X	0079	F-B	S-Y	0151	F-B	S-Y
0018	F-B	S-Z	0081	F-B	S-Y	0153	F-B	S-Y
0019	F-B	S-Z	0082	F-B	S-Y	0154	F-B	S-Y
0020	F-B	S-Z	0083	F-B	S-Y	0155	F-B	S-Y
0021	F-B	S-Z	0084	F-B	S-Y	0159	F-B	S-Y
0027	F-B	S-Y	0092	F-B	S-X	0160	F-B	S-Y
0028	F-B	S-Y	0093	F-B	S-X	0161	F-B	S-Y
0029	F-B	S-X	0094	F-B	S-Y	0167	F-B	S-X
0030	F-B	S-X	0099	F-B	S-X	0168	F-B	S-X
0033	F-B	S-X	0101	F-B	S-X	0169	F-B	S-X
0034	F-B	S-X	0102	F-B	S-X	0171	F-B	S-X
0035	F-B	S-X	0103	F-B	S-X	0173	F-B	S-X
0037	F-B	S-X	0104	F-B	S-X	0174	F-B	S-X
0038	F-B	S-X	0105	F-B	S-X	0180	F-B	S-X
0039	F-B	S-X	0106	F-B	S-X	0181	F-B	S-X
0042	F-B	S-X	0107	F-B	S-X	0182	F-B	S-X
0043	F-B	S-X	0110	F-B	S-X	0183	F-B	S-X
0044	F-B	S-X	0113	F-B	S-Y	0186	F-B	S-X
0048	F-B	S-X	0114	F-B	S-Y	0190	F-B	S-X
0049	F-B	S-X	0118	F-B	S-Y	0191	F-B	S-X
0050	F-B	S-X	0121	F-B	S-X	0192	F-B	S-X
0054	F-B	S-X	0124	F-B	S-X	0193	F-B	S-X
0055	F-B	S-X	0129	F-B	S-Y	0194	F-B	S-X
0056	F-B	S-X	0130	F-B	S-Y	0195	F-B	S-X
0059	F-B	S-X	0131	F-B	S-X	0196	F-B	S-X
0060	F-B	S-X	0132	F-B	S-Y	0197	F-B	S-X
0065	F-B	S-X	0133	F-B	S-Y	0204	F-B	S-X

UN No.	EmS Fire	EmS Spill	UN No.	EmS Fire	EmS Spill	UN No.	EmS Fire	EmS Spill
0207	F-B	S-Y	0280	F-B	S-X	0334	F-B	S-X
0208	F-B	S-Y	0281	F-B	S-X	0335	F-B	S-X
0209	F-B	S-Y	0282	F-B	S-Y	0336	F-B	S-X
0212	F-B	S-X	0283	F-B	S-X	0337	F-B	S-X
0213	F-B	S-Y	0284	F-B	S-X	0338	F-B	S-X
0214	F-B	S-Y	0285	F-B	S-X	0339	F-B	S-X
0215	F-B	S-Y	0286	F-B	S-X	0340	F-B	S-Y
0216	F-B	S-Y	0287	F-B	S-X	0341	F-B	S-Y
0217	F-B	S-Y	0288	F-B	S-X	0342	F-B	S-Y
0218	F-B	S-Y	0289	F-B	S-X	0343	F-B	S-Y
0219	F-B	S-Y	0290	F-B	S-X	0344	F-B	S-X
0220	F-B	S-Y	0291	F-B	S-X	0345	F-B	S-X
0221	F-B	S-X	0292	F-B	S-X	0346	F-B	S-X
0222	F-B	S-Y	0293	F-B	S-X	0347	F-B	S-X
0224	F-B	S-Z	0294	F-B	S-X	0348	F-B	S-X
0225	F-B	S-X	0295	F-B	S-X	0349	F-B	S-X
0226	F-B	S-Y	0296	F-B	S-X	0350	F-B	S-X
0234	F-B	S-Z	0297	F-B	S-X	0351	F-B	S-X
0235	F-B	S-Y	0299	F-B	S-X	0352	F-B	S-X
0236	F-B	S-Y	0300	F-B	S-X	0353	F-B	S-X
0237	F-B	S-X	0301	F-B	S-Z	0354	F-B	S-X
0238	F-B	S-X	0303	F-B	S-X	0355	F-B	S-X
0240	F-B	S-X	0305	F-B	S-Y	0356	F-B	S-X
0241	F-B	S-X	0306	F-B	S-X	0357	F-B	S-Y
0242	F-B	S-X	0312	F-B	S-X	0358	F-B	S-Y
0243	F-B	S-X	0313	F-B	S-X	0359	F-B	S-Y
0244	F-B	S-X	0314	F-B	S-X	0360	F-B	S-X
0245	F-B	S-X	0315	F-B	S-X	0361	F-B	S-X
0246	F-B	S-X	0316	F-B	S-X	0362	F-B	S-X
0247	F-B	S-X	0317	F-B	S-X	0363	F-B	S-X
0248	F-B	S-Y	0318	F-B	S-X	0364	F-B	S-X
0249	F-B	S-Y	0319	F-B	S-X	0365	F-B	S-X
0250	F-B	S-X	0320	F-B	S-X	0366	F-B	S-X
0254	F-B	S-X	0321	F-B	S-X	0367	F-B	S-X
0255	F-B	S-X	0322	F-B	S-X	0368	F-B	S-X
0257	F-B	S-X	0323	F-B	S-X	0369	F-B	S-X
0266	F-B	S-Y	0324	F-B	S-X	0370	F-B	S-X
0267	F-B	S-X	0325	F-B	S-X	0371	F-B	S-X
0268	F-B	S-X	0326	F-B	S-X	0372	F-B	S-X
0271	F-B	S-X	0327	F-B	S-X	0373	F-B	S-X
0272	F-B	S-X	0328	F-B	S-X	0374	F-B	S-X
0275	F-B	S-X	0329	F-B	S-X	0375	F-B	S-X
0276	F-B	S-X	0330	F-B	S-X	0376	F-B	S-X
0277	F-B	S-X	0331	F-B	S-Y	0377	F-B	S-X
0278	F-B	S-X	0332	F-B	S-Y	0378	F-B	S-X
0279	F-B	S-X	0333	F-B	S-X	0379	F-B	S-X

UN No.	EmS Fire	EmS Spill	UN No.	EmS Fire	EmS Spill	UN No.	EmS Fire	EmS Spill
0380	F-B	S-X	0429	F-B	S-X	0475	F-B	S-Y
0381	F-B	S-X	0430	F-B	S-X	0476	F-B	S-Y
0382	F-B	S-X	0431	F-B	S-X	0477	F-B	S-Y
0383	F-B	S-X	0432	F-B	S-X	0478	F-B	S-Y
0384	F-B	S-X	0433	F-B	S-Y	0479	F-B	S-Y
0385	F-B	S-Y	0434	F-B	S-X	0480	F-B	S-Y
0386	F-B	S-Y	0435	F-B	S-X	0481	F-B	S-Y
0387	F-B	S-Y	0436	F-B	S-X	0482	F-B	S-Y
0388	F-B	S-Y	0437	F-B	S-X	0483	F-B	S-Y
0389	F-B	S-Y	0438	F-B	S-X	0484	F-B	S-Y
0390	F-B	S-Y	0439	F-B	S-X	0485	F-B	S-Y
0391	F-B	S-Y	0440	F-B	S-X	0486	F-B	S-X
0392	F-B	S-Y	0441	F-B	S-X	0487	F-B	S-X
0393	F-B	S-Y	0442	F-B	S-X	0488	F-B	S-X
0394	F-B	S-Y	0443	F-B	S-X	0489	F-B	S-Y
0395	F-B	S-X	0444	F-B	S-X	0490	F-B	S-Y
0396	F-B	S-X	0445	F-B	S-X	0491	F-B	S-X
0397	F-B	S-X	0446	F-B	S-X	0492	F-B	S-X
0398	F-B	S-X	0447	F-B	S-X	0493	F-B	S-X
0399	F-B	S-X	0448	F-B	S-Y	0494	F-B	S-X
0400	F-B	S-X	0449	F-B	S-X	0495	F-B	S-Y
0401	F-B	S-Y	0450	F-B	S-X	0496	F-B	S-Y
0402	F-B	S-Y	0451	F-B	S-X	0497	F-B	S-Y
0403	F-B	S-X	0452	F-B	S-X	0498	F-B	S-Y
0404	F-B	S-X	0453	F-B	S-X	0499	F-B	S-Y
0405	F-B	S-X	0454	F-B	S-X	0500	F-B	S-X
0406	F-B	S-Y	0455	F-B	S-X	0501	F-B	S-Y
0407	F-B	S-Y	0456	F-B	S-X	0502	F-B	S-X
0408	F-B	S-X	0457	F-B	S-X	0503	F-B	S-X
0409	F-B	S-X	0458	F-B	S-X	0504	F-B	S-Y
0410	F-B	S-X	0459	F-B	S-X	0505	F-B	S-X
0411	F-B	S-Y	0460	F-B	S-X	0506	F-B	S-X
0412	F-B	S-X	0461	F-B	S-X	0507	F-B	S-X
0413	F-B	S-X	0462	F-B	S-X	0508	F-B	S-Y
0414	F-B	S-X	0463	F-B	S-X	0509	F-B	S-Y
0415	F-B	S-X	0464	F-B	S-X	0510	F-B	S-X
0417	F-B	S-X	0465	F-B	S-X	1001	F-D	S-U
0418	F-B	S-X	0466	F-B	S-X	1002	F-C	S-V
0419	F-B	S-X	0467	F-B	S-X	1003	F-C	S-W
0420	F-B	S-X	0468	F-B	S-X	1005	F-C	S-U
0421	F-B	S-X	0469	F-B	S-X	1006	F-C	S-V
0424	F-B	S-X	0470	F-B	S-X	1008	F-C	S-U
0425	F-B	S-X	0471	F-B	S-X	1009	F-C	S-V
0426	F-B	S-X	0472	F-B	S-X	1010	F-D	S-U
0427	F-B	S-X	0473	F-B	S-Y	1011	F-D	S-U
0428	F-B	S-X	0474	F-B	S-Y	1012	F-D	S-U

UN No.	EmS Fire	EmS Spill	UN No.	EmS Fire	EmS Spill	UN No.	EmS Fire	EmS Spill
1013	F-C	S-V	1071	F-D	S-U	1135	F-E	S-D
1016	F-D	S-U	1072	F-C	S-W	1136	F-E	S-E
1017	F-C	S-U	1073	F-C	S-W	1139	F-E	S-E
1018	F-C	S-V	1075	F-D	S-U	1143	F-E	S-D
1020	F-C	S-V	1076	F-C	S-U	1144	F-E	S-D
1021	F-C	S-V	1077	F-D	S-U	1145	F-E	S-D
1022	F-C	S-V	1078	F-C	S-V	1146	F-E	S-D
1023	F-D	S-U	1079	F-C	S-U	1147	F-E	S-D
1026	F-D	S-U	1080	F-C	S-V	1148	F-E	S-D
1027	F-D	S-U	1081	F-D	S-U	1149	F-E	S-D
1028	F-C	S-V	1082	F-D	S-U	1150	F-E	S-D
1029	F-C	S-V	1083	F-D	S-U	1152	F-E	S-D
1030	F-D	S-U	1085	F-D	S-U	1153	F-E	S-D
1032	F-D	S-U	1086	F-D	S-U	1154	F-E	S-C
1033	F-D	S-U	1087	F-D	S-U	1155	F-E	S-D
1035	F-D	S-U	1088	F-E	S-D	1156	F-E	S-D
1036	F-D	S-U	1089	F-E	S-D	1157	F-E	S-D
1037	F-D	S-U	1090	F-E	S-D	1158	F-E	S-C
1038	F-D	S-U	1091	F-E	S-D	1159	F-E	S-D
1039	F-D	S-U	1092	F-E	S-D	1160	F-E	S-C
1040	F-D	S-U	1093	F-E	S-D	1161	F-E	S-D
1041	F-D	S-U	1098	F-E	S-D	1162	F-E	S-C
1043	F-C	S-V	1099	F-E	S-D	1163	F-E	S-C
1044	F-C	S-V	1100	F-E	S-D	1164	F-E	S-D
1045	F-C	S-W	1104	F-E	S-D	1165	F-E	S-D
1046	F-C	S-V	1105	F-E	S-D	1166	F-E	S-D
1048	F-C	S-U	1106	F-E	S-C	1167	F-E	S-D
1049	F-D	S-U	1107	F-E	S-D	1169	F-E	S-D
1050	F-C	S-U	1108	F-E	S-D	1170	F-E	S-D
1051	F-E	S-D	1109	F-E	S-D	1171	F-E	S-D
1052	F-C	S-U	1110	F-E	S-D	1172	F-E	S-D
1053	F-D	S-U	1111	F-E	S-D	1173	F-E	S-D
1055	F-D	S-U	1112	F-E	S-D	1175	F-E	S-D
1056	F-C	S-V	1113	F-E	S-D	1176	F-E	S-D
1057	F-D	S-U	1114	F-E	S-D	1177	F-E	S-D
1058	F-C	S-V	1120	F-E	S-D	1178	F-E	S-D
1060	F-D	S-U	1123	F-E	S-D	1179	F-E	S-D
1061	F-D	S-U	1125	F-E	S-C	1180	F-E	S-D
1062	F-C	S-U	1126	F-E	S-D	1181	F-E	S-D
1063	F-D	S-U	1127	F-E	S-D	1182	F-E	S-C
1064	F-D	S-U	1128	F-E	S-D	1183	F-G	S-O
1065	F-C	S-V	1129	F-E	S-D	1184	F-E	S-D
1066	F-C	S-V	1130	F-E	S-E	1185	F-E	S-D
1067	F-C	S-W	1131	F-E	S-D	1188	F-E	S-D
1069	F-C	S-U	1133	F-E	S-D	1189	F-E	S-D
1070	F-C	S-W	1134	F-E	S-D	1190	F-E	S-D

UN No.	EmS Fire	EmS Spill	UN No.	EmS Fire	EmS Spill	UN No.	EmS Fire	EmS Spill
1191	F-E	S-D	1250	F-E	S-C	1314	F-A	S-I
1192	F-E	S-D	1251	F-E	S-C	1318	F-A	S-I
1193	F-E	S-D	1259	F-E	S-D	1320	F-B	S-J
1194	F-E	S-D	1261	F-E	S-D	1321	F-B	S-J
1195	F-E	S-D	1262	F-E	S-E	1322	F-B	S-J
1196	F-E	S-C	1263	F-E	S-E	1323	F-G	S-G
1197	F-E	S-D	1264	F-E	S-D	1324	F-A	S-I
1198	F-E	S-C	1265	F-E	S-D	1325	F-A	S-G
1199	F-E	S-D	1266	F-E	S-D	1326	F-A	S-J
1201	F-E	S-D	1267	F-E	S-E	1327	F-A	S-I
1202	F-E	S-E	1268	F-E	S-E	1328	F-A	S-G
1203	F-E	S-E	1272	F-E	S-E	1330	F-A	S-I
1204	F-E	S-D	1274	F-E	S-D	1331	F-A	S-I
1206	F-E	S-D	1275	F-E	S-D	1332	F-A	S-G
1207	F-E	S-D	1276	F-E	S-D	1333	F-G	S-P
1208	F-E	S-D	1277	F-E	S-C	1334	F-A	S-G
1210	F-E	S-D	1278	F-E	S-D	1336	F-B	S-J
1212	F-E	S-D	1279	F-E	S-D	1337	F-B	S-J
1213	F-E	S-D	1280	F-E	S-D	1338	F-A	S-G
1214	F-E	S-C	1281	F-E	S-D	1339	F-G	S-G
1216	F-E	S-D	1282	F-E	S-D	1340	F-G	S-N
1218	F-E	S-D	1286	F-E	S-E	1341	F-A	S-G
1219	F-E	S-D	1287	F-E	S-D	1343	F-G	S-G
1220	F-E	S-D	1288	F-E	S-E	1344	F-B	S-J
1221	F-E	S-C	1289	F-E	S-C	1345	F-A	S-I
1222	F-E	S-D	1292	F-E	S-D	1346	F-A	S-G
1223	F-E	S-E	1293	F-E	S-D	1347	F-B	S-J
1224	F-E	S-D	1294	F-E	S-D	1348	F-B	S-J
1228	F-E	S-D	1295	F-G	S-O	1349	F-B	S-J
1229	F-E	S-D	1296	F-E	S-C	1350	F-A	S-G
1230	F-E	S-D	1297	F-E	S-C	1352	F-A	S-J
1231	F-E	S-D	1298	F-E	S-C	1353	F-A	S-I
1233	F-E	S-D	1299	F-E	S-E	1354	F-B	S-J
1234	F-E	S-D	1300	F-E	S-E	1355	F-B	S-J
1235	F-E	S-C	1301	F-E	S-D	1356	F-B	S-J
1237	F-E	S-D	1302	F-E	S-D	1357	F-B	S-J
1238	F-E	S-C	1303	F-E	S-D	1358	F-G	S-J
1239	F-E	S-D	1304	F-E	S-D	1360	F-G	S-N
1242	F-G	S-O	1305	F-E	S-C	1361	F-A	S-J
1243	F-E	S-D	1306	F-E	S-D	1362	F-A	S-J
1244	F-E	S-C	1307	F-E	S-D	1363	F-A	S-J
1245	F-E	S-D	1308	F-E	S-D	1364	F-A	S-J
1246	F-E	S-D	1309	F-G	S-G	1365	F-A	S-J
1247	F-E	S-D	1310	F-B	S-J	1369	F-A	S-J
1248	F-E	S-D	1312	F-A	S-I	1372	F-A	S-J
1249	F-E	S-D	1313	F-A	S-I	1373	F-A	S-J

UN No.	EmS Fire	EmS Spill	UN No.	EmS Fire	EmS Spill	UN No.	EmS Fire	EmS Spill
1374	F-A	S-J	1423	F-G	S-N	1479	F-A	S-Q
1376	F-G	S-P	1426	F-G	S-O	1481	F-H	S-Q
1378	F-H	S-M	1427	F-G	S-O	1482	F-H	S-Q
1379	F-A	S-J	1428	F-G	S-N	1483	F-G	S-Q
1380	F-G	S-L	1431	F-A	S-L	1484	F-H	S-Q
1381	F-A	S-J	1432	F-G	S-N	1485	F-H	S-Q
1382	F-A	S-J	1433	F-G	S-N	1486	F-A	S-Q
1383	F-G	S-M	1435	F-G	S-O	1487	F-A	S-Q
1384	F-A	S-J	1436 I	F-G	S-O	1488	F-A	S-Q
1385	F-A	S-J	1436 II	F-G	S-O	1489	F-H	S-Q
1386	F-A	S-J	1436 III	F-G	S-O	1490	F-H	S-Q
1387	F-A	S-J	1437	F-A	S-G	1491	F-G	S-Q
1389	F-G	S-N	1438	F-A	S-Q	1492	F-A	S-Q
1390	F-G	S-O	1439	F-H	S-Q	1493	F-A	S-Q
1391	F-G	S-N	1442	F-H	S-Q	1494	F-H	S-Q
1392	F-G	S-N	1444	F-A	S-Q	1495	F-H	S-Q
1393	F-G	S-N	1445	F-H	S-Q	1496	F-H	S-Q
1394	F-G	S-N	1446	F-A	S-Q	1498	F-A	S-Q
1395	F-G	S-N	1447	F-H	S-Q	1499	F-A	S-Q
1396	F-G	S-O	1448	F-H	S-Q	1500	F-A	S-Q
1397	F-G	S-N	1449	F-G	S-Q	1502	F-H	S-Q
1398	F-G	S-N	1450	F-H	S-Q	1503	F-H	S-Q
1400	F-G	S-O	1451	F-A	S-Q	1504	F-G	S-Q
1401	F-G	S-O	1452	F-H	S-Q	1505	F-A	S-Q
1402 I	F-G	S-N	1453	F-H	S-Q	1506	F-H	S-Q
1402 II	F-G	S-N	1454	F-A	S-Q	1507	F-A	S-Q
1403	F-G	S-N	1455	F-H	S-Q	1508	F-H	S-Q
1404	F-G	S-O	1456	F-H	S-Q	1509	F-G	S-Q
1405	F-G	S-N	1457	F-G	S-Q	1510	F-H	S-Q
1407	F-G	S-N	1458	F-H	S-Q	1511	F-A	S-Q
1408	F-G	S-N	1459	F-H	S-Q	1513	F-H	S-Q
1409 I	F-G	S-L	1461	F-H	S-Q	1514	F-H	S-Q
1409 II	F-G	S-L	1462	F-H	S-Q	1515	F-H	S-Q
1410	F-G	S-M	1463	F-A	S-Q	1516	F-G	S-Q
1411	F-G	S-M	1465	F-A	S-Q	1517	F-B	S-J
1413	F-G	S-O	1466	F-A	S-Q	1541	F-A	S-A
1414	F-G	S-N	1467	F-A	S-Q	1544	F-A	S-A
1415	F-G	S-N	1469	F-A	S-Q	1545	F-E	S-D
1417	F-G	S-N	1470	F-H	S-Q	1546	F-A	S-A
1418 I	F-G	S-O	1471	F-H	S-Q	1547	F-A	S-A
1418 II	F-G	S-O	1472	F-G	S-Q	1548	F-A	S-A
1418 III	F-G	S-O	1473	F-H	S-Q	1549	F-A	S-A
1419	F-G	S-N	1474	F-A	S-Q	1550	F-A	S-A
1420	F-G	S-L	1475	F-H	S-Q	1551	F-A	S-A
1421	F-G	S-L	1476	F-G	S-Q	1553	F-A	S-A
1422	F-G	S-L	1477	F-A	S-Q	1554	F-A	S-A

UN No.	EmS Fire	EmS Spill	UN No.	EmS Fire	EmS Spill	UN No.	EmS Fire	EmS Spill
1555	F-A	S-A	1606	F-A	S-A	1660	F-C	S-W
1556	F-A	S-A	1607	F-A	S-A	1661	F-A	S-A
1557	F-A	S-A	1608	F-A	S-A	1662	F-A	S-A
1558	F-A	S-A	1611	F-A	S-A	1663	F-A	S-A
1559	F-A	S-A	1612	F-C	S-U	1664	F-A	S-A
1560	F-A	S-A	1613	F-A	S-A	1665	F-A	S-A
1561	F-A	S-A	1614	F-A	S-U	1669	F-A	S-A
1562	F-A	S-A	1616	F-A	S-A	1670	F-A	S-A
1564	F-A	S-A	1617	F-A	S-A	1671	F-A	S-A
1565	F-A	S-A	1618	F-A	S-A	1672	F-A	S-A
1566	F-A	S-A	1620	F-A	S-A	1673	F-A	S-A
1567	F-G	S-G	1621	F-A	S-A	1674	F-A	S-A
1569	F-E	S-D	1622	F-A	S-A	1677	F-A	S-A
1570	F-A	S-A	1623	F-A	S-A	1678	F-A	S-A
1571	F-B	S-J	1624	F-A	S-A	1679	F-A	S-A
1572	F-A	S-A	1625	F-A	S-A	1680	F-A	S-A
1573	F-A	S-A	1626	F-A	S-A	1683	F-A	S-A
1574	F-A	S-A	1627	F-A	S-A	1684	F-A	S-A
1575	F-A	S-A	1629	F-A	S-A	1685	F-A	S-A
1577	F-A	S-A	1630	F-A	S-A	1686	F-A	S-A
1578	F-A	S-A	1631	F-A	S-A	1687	F-A	S-A
1579	F-A	S-A	1634	F-A	S-A	1688	F-A	S-A
1580	F-A	S-A	1636	F-A	S-A	1689	F-A	S-A
1581	F-C	S-U	1637	F-A	S-A	1690	F-A	S-A
1582	F-C	S-U	1638	F-A	S-A	1691	F-A	S-A
1583	F-A	S-A	1639	F-A	S-A	1692	F-A	S-A
1585	F-A	S-A	1640	F-A	S-A	1693	F-A	S-A
1586	F-A	S-A	1641	F-A	S-A	1694	F-A	S-A
1587	F-A	S-A	1642	F-A	S-A	1695	F-E	S-C
1588	F-A	S-A	1643	F-A	S-A	1697	F-A	S-A
1589	F-C	S-U	1644	F-A	S-A	1698	F-A	S-A
1590	F-A	S-A	1645	F-A	S-A	1699	F-A	S-A
1591	F-A	S-A	1646	F-A	S-A	1700	F-A	S-G
1593	F-A	S-A	1647	F-A	S-A	1701	F-A	S-A
1594	F-A	S-A	1648	F-E	S-D	1702	F-A	S-A
1595	F-A	S-B	1649	F-A	S-A	1704	F-A	S-A
1596	F-A	S-A	1650	F-A	S-A	1707	F-A	S-A
1597	F-A	S-A	1651	F-A	S-A	1708	F-A	S-A
1598	F-A	S-A	1652	F-A	S-A	1709	F-A	S-A
1599	F-A	S-A	1653	F-A	S-A	1710	F-A	S-A
1600	F-A	S-A	1654	F-A	S-A	1711	F-A	S-A
1601	F-A	S-A	1655	F-A	S-A	1712	F-A	S-A
1602	F-A	S-A	1656	F-A	S-A	1713	F-A	S-A
1603	F-E	S-D	1657	F-A	S-A	1714	F-G	S-N
1604	F-E	S-C	1658	F-A	S-A	1715	F-E	S-C
1605	F-A	S-A	1659	F-A	S-A	1716	F-A	S-B

UN No.	EmS Fire	EmS Spill	UN No.	EmS Fire	EmS Spill	UN No.	EmS Fire	EmS Spill
1717	F-E	S-C	1767	F-E	S-C	1816	F-E	S-C
1718	F-A	S-B	1768	F-A	S-B	1817	F-A	S-B
1719	F-A	S-B	1769	F-A	S-B	1818	F-A	S-B
1722	F-E	S-C	1770	F-A	S-B	1819	F-A	S-B
1723	F-E	S-C	1771	F-A	S-B	1823	F-A	S-B
1724	F-E	S-C	1773	F-A	S-B	1824	F-A	S-B
1725	F-A	S-B	1774	F-A	S-B	1825	F-A	S-B
1726	F-A	S-B	1775	F-A	S-B	1826 II	F-A	S-B
1727	F-A	S-B	1776	F-A	S-B	1826 I	F-A	S-Q
1728	F-A	S-B	1777	F-A	S-B	1827	F-A	S-B
1729	F-A	S-B	1778	F-A	S-B	1828	F-A	S-B
1730	F-A	S-B	1779	F-E	S-C	1829	F-A	S-B
1731	F-A	S-B	1780	F-A	S-B	1830	F-A	S-B
1732	F-A	S-B	1781	F-A	S-B	1831	F-A	S-B
1733	F-A	S-B	1782	F-A	S-B	1832	F-A	S-B
1736	F-A	S-B	1783	F-A	S-B	1833	F-A	S-B
1737	F-A	S-B	1784	F-A	S-B	1834	F-A	S-B
1738	F-A	S-B	1786	F-A	S-B	1835	F-A	S-B
1739	F-A	S-B	1787	F-A	S-B	1836	F-A	S-B
1740	F-A	S-B	1788	F-A	S-B	1837	F-A	S-B
1741	F-C	S-U	1789	F-A	S-B	1838	F-A	S-B
1742	F-A	S-B	1790	F-A	S-B	1839	F-A	S-B
1743	F-A	S-B	1791	F-A	S-B	1840	F-A	S-B
1744	F-A	S-B	1792	F-A	S-B	1841	F-A	S-B
1745	F-A	S-B	1793	F-A	S-B	1843	F-A	S-A
1746	F-A	S-B	1794	F-A	S-B	1845	F-C	S-V
1747	F-E	S-C	1796 II	F-A	S-B	1846	F-A	S-A
1748	F-H	S-Q	1796 I	F-A	S-Q	1847	F-A	S-B
1749	F-C	S-W	1798	F-A	S-B	1848	F-A	S-B
1750	F-A	S-B	1799	F-A	S-B	1849	F-A	S-B
1751	F-A	S-B	1800	F-A	S-B	1851	F-A	S-A
1752	F-A	S-B	1801	F-A	S-B	1854	F-G	S-M
1753	F-A	S-B	1802	F-H	S-Q	1855	F-G	S-M
1754	F-A	S-B	1803	F-A	S-B	1856	F-A	S-J
1755	F-A	S-B	1804	F-A	S-B	1857	F-A	S-J
1756	F-A	S-B	1805	F-A	S-B	1858	F-C	S-V
1757	F-A	S-B	1806	F-A	S-B	1859	F-C	S-U
1758	F-A	S-B	1807	F-A	S-B	1860	F-D	S-U
1759	F-A	S-B	1808	F-A	S-B	1862	F-E	S-D
1760	F-A	S-B	1809	F-A	S-B	1863	F-E	S-E
1761	F-A	S-B	1810	F-A	S-B	1865	F-E	S-D
1762	F-A	S-B	1811	F-A	S-B	1866	F-E	S-E
1763	F-A	S-B	1812	F-A	S-A	1868	F-A	S-G
1764	F-A	S-B	1813	F-A	S-B	1869	F-G	S-G
1765	F-A	S-B	1814	F-A	S-B	1870	F-G	S-O
1766	F-A	S-B	1815	F-E	S-C	1871	F-A	S-G

UN No.	EmS Fire	EmS Spill	UN No.	EmS Fire	EmS Spill	UN No.	EmS Fire	EmS Spill
1872	F-A	S-Q	1945	F-A	S-I	2002	F-A	S-J
1873	F-A	S-Q	1950	F-D	S-U	2004	F-G	S-M
1884	F-A	S-A	1951	F-C	S-V	2006	F-A	S-G
1885	F-A	S-A	1952	F-C	S-V	2008	F-G	S-M
1886	F-A	S-A	1953	F-D	S-U	2009	F-G	S-M
1887	F-A	S-A	1954	F-D	S-U	2010	F-G	S-O
1888	F-A	S-A	1955	F-C	S-U	2011	F-G	S-N
1889	F-A	S-B	1956	F-C	S-V	2012	F-G	S-N
1891	F-A	S-A	1957	F-D	S-U	2013	F-G	S-N
1892	F-A	S-A	1958	F-C	S-V	2014	F-H	S-Q
1894	F-A	S-A	1959	F-D	S-U	2015	F-H	S-Q
1895	F-A	S-A	1961	F-D	S-U	2016	F-A	S-A
1897	F-A	S-A	1962	F-D	S-U	2017	F-A	S-B
1898	F-A	S-B	1963	F-C	S-V	2018	F-A	S-A
1902	F-A	S-B	1964	F-D	S-U	2019	F-A	S-A
1903	F-A	S-B	1965	F-D	S-U	2020	F-A	S-A
1905	F-A	S-B	1966	F-D	S-U	2021	F-A	S-A
1906	F-A	S-B	1967	F-C	S-U	2022	F-A	S-B
1907	F-A	S-B	1968	F-C	S-V	2023	F-E	S-D
1908	F-A	S-B	1969	F-D	S-U	2024	F-A	S-A
1911	F-D	S-U	1970	F-C	S-V	2025	F-A	S-A
1912	F-D	S-U	1971	F-D	S-U	2026	F-A	S-A
1913	F-C	S-V	1972	F-D	S-U	2027	F-A	S-A
1914	F-E	S-D	1973	F-C	S-V	2028	F-A	S-B
1915	F-E	S-D	1974	F-C	S-V	2029	F-E	S-C
1916	F-E	S-D	1975	F-C	S-W	2030	F-A	S-B
1917	F-E	S-D	1976	F-C	S-V	2031 I	F-A	S-Q
1918	F-E	S-E	1977	F-C	S-V	2031 II*	F-A	S-Q
1919	F-E	S-D	1978	F-D	S-U	2031 II†	F-A	S-B
1920	F-E	S-E	1982	F-C	S-V	2032	F-A	S-Q
1921	F-E	S-D	1983	F-C	S-V	2033	F-A	S-B
1922	F-E	S-C	1984	F-C	S-V	2034	F-D	S-U
1923	F-A	S-J	1986	F-E	S-D	2035	F-D	S-U
1928	F-G	S-L	1987	F-E	S-D	2036	F-C	S-V
1929	F-A	S-J	1988	F-E	S-D	2037	F-D	S-U
1931	F-A	S-J	1989	F-E	S-D	2038	F-A	S-A
1932	F-G	S-L	1990	F-A	S-A	2044	F-D	S-U
1935	F-A	S-A	1991	F-E	S-D	2045	F-E	S-D
1938	F-A	S-B	1992	F-E	S-D	2046	F-E	S-D
1939	F-A	S-B	1993	F-E	S-E	2047	F-E	S-D
1940	F-A	S-B	1994	F-E	S-D	2048	F-E	S-D
1941	F-A	S-A	1999	F-E	S-E	2049	F-E	S-D
1942	F-H	S-Q	2000	F-A	S-I	2050	F-E	S-D
1944	F-A	S-I	2001	F-A	S-I	2051	F-E	S-C

* Applies to NITRIC ACID other than red fuming, with at least 65% but with not more than 70% nitric acid.

† Applies to NITRIC ACID other than red fuming, with less than 65% nitric acid.

UN No.	EmS Fire	EmS Spill	UN No.	EmS Fire	EmS Spill	UN No.	EmS Fire	EmS Spill
2052	F-E	S-E	2217	F-A	S-J	2272	F-A	S-A
2053	F-E	S-D	2218	F-E	S-C	2273	F-A	S-A
2054	F-E	S-C	2219	F-E	S-D	2274	F-A	S-A
2055	F-E	S-D	2222	F-E	S-D	2275	F-E	S-D
2056	F-E	S-D	2224	F-A	S-A	2276	F-E	S-C
2057	F-E	S-D	2225	F-A	S-B	2277	F-E	S-D
2058	F-E	S-D	2226	F-A	S-B	2278	F-E	S-D
2059	F-E	S-D	2227	F-E	S-D	2279	F-A	S-A
2067	F-H	S-Q	2232	F-A	S-A	2280	F-A	S-B
2071	F-H	S-Q	2233	F-A	S-A	2281	F-A	S-A
2073	F-C	S-U	2234	F-E	S-D	2282	F-E	S-D
2074	F-A	S-A	2235	F-A	S-A	2283	F-E	S-D
2075	F-A	S-A	2236	F-A	S-A	2284	F-E	S-D
2076	F-A	S-B	2237	F-A	S-A	2285	F-E	S-D
2077	F-A	S-A	2238	F-E	S-D	2286	F-E	S-D
2078	F-A	S-A	2239	F-A	S-A	2287	F-E	S-D
2079	F-A	S-B	2240	F-A	S-B	2288	F-E	S-D
2187	F-C	S-V	2241	F-E	S-D	2289	F-A	S-B
2188	F-D	S-U	2242	F-E	S-D	2290	F-A	S-A
2189	F-D	S-U	2243	F-E	S-D	2291	F-A	S-A
2190	F-C	S-W	2244	F-E	S-D	2293	F-E	S-D
2191	F-C	S-U	2245	F-E	S-D	2294	F-A	S-A
2192	F-D	S-U	2246	F-E	S-D	2295	F-E	S-D
2193	F-C	S-V	2247	F-E	S-E	2296	F-E	S-D
2194	F-C	S-U	2248	F-E	S-C	2297	F-E	S-D
2195	F-C	S-U	2249	F-E	S-D	2298	F-E	S-D
2196	F-C	S-U	2250	F-A	S-A	2299	F-A	S-A
2197	F-C	S-U	2251	F-E	S-D	2300	F-A	S-A
2198	F-C	S-U	2252	F-E	S-D	2301	F-E	S-D
2199	F-D	S-U	2253	F-A	S-A	2302	F-E	S-D
2200	F-D	S-U	2254	F-A	S-I	2303	F-E	S-D
2201	F-C	S-W	2256	F-E	S-D	2304	F-A	S-H
2202	F-D	S-U	2257	F-G	S-N	2305	F-A	S-B
2203	F-D	S-U	2258	F-E	S-C	2306	F-A	S-A
2204	F-D	S-U	2259	F-A	S-B	2307	F-A	S-A
2205	F-A	S-A	2260	F-E	S-C	2308	F-A	S-B
2206	F-A	S-A	2261	F-A	S-A	2309	F-E	S-D
2208	F-H	S-Q	2262	F-A	S-B	2310	F-E	S-D
2209	F-A	S-B	2263	F-E	S-D	2311	F-A	S-A
2210	F-G	S-L	2264	F-E	S-C	2312	F-A	S-A
2211	F-A	S-I	2265	F-E	S-D	2313	F-E	S-D
2212	F-A	S-A	2266	F-E	S-C	2315	F-A	S-A
2213	F-A	S-G	2267	F-A	S-B	2316	F-A	S-A
2214	F-A	S-B	2269	F-A	S-B	2317	F-A	S-A
2215	F-A	S-B	2270	F-E	S-C	2318	F-A	S-J
2216	F-A	S-J	2271	F-E	S-D	2319	F-E	S-D

UN No.	EmS Fire	EmS Spill	UN No.	EmS Fire	EmS Spill	UN No.	EmS Fire	EmS Spill
2320	F-A	S-B	2370	F-E	S-D	2418	F-C	S-U
2321	F-A	S-A	2371	F-E	S-D	2419	F-D	S-U
2322	F-A	S-A	2372	F-E	S-D	2420	F-C	S-U
2323	F-E	S-D	2373	F-E	S-D	2421	F-C	S-W
2324	F-E	S-D	2374	F-E	S-D	2422	F-C	S-V
2325	F-E	S-D	2375	F-E	S-D	2424	F-C	S-V
2326	F-A	S-B	2376	F-E	S-D	2426	F-H	S-Q
2327	F-A	S-B	2377	F-E	S-D	2427	F-H	S-Q
2328	F-A	S-A	2378	F-E	S-D	2428	F-H	S-Q
2329	F-E	S-D	2379	F-E	S-C	2429	F-H	S-Q
2330	F-E	S-E	2380	F-E	S-D	2430	F-A	S-B
2331	F-A	S-B	2381	F-E	S-D	2431	F-A	S-A
2332	F-E	S-D	2382	F-E	S-D	2432	F-A	S-A
2333	F-E	S-D	2383	F-E	S-C	2433	F-A	S-A
2334	F-E	S-D	2384	F-E	S-D	2434	F-A	S-B
2335	F-E	S-D	2385	F-E	S-D	2435	F-A	S-B
2336	F-E	S-D	2386	F-E	S-C	2436	F-E	S-D
2337	F-E	S-D	2387	F-E	S-D	2437	F-A	S-B
2338	F-E	S-D	2388	F-E	S-D	2438	F-E	S-C
2339	F-E	S-D	2389	F-E	S-D	2439	F-A	S-B
2340	F-E	S-D	2390	F-E	S-D	2440	F-A	S-B
2341	F-E	S-D	2391	F-E	S-D	2441	F-G	S-M
2342	F-E	S-D	2392	F-E	S-D	2442	F-A	S-B
2343	F-E	S-D	2393	F-E	S-D	2443	F-A	S-B
2344	F-E	S-D	2394	F-E	S-D	2444	F-A	S-B
2345	F-E	S-D	2395	F-E	S-C	2446	F-A	S-A
2346	F-E	S-D	2396	F-E	S-D	2447	F-A	S-M
2347	F-E	S-D	2397	F-E	S-D	2448	F-A	S-H
2348	F-E	S-D	2398	F-E	S-D	2451	F-C	S-W
2350	F-E	S-D	2399	F-E	S-C	2452	F-D	S-U
2351	F-E	S-D	2400	F-E	S-D	2453	F-D	S-U
2352	F-E	S-D	2401	F-E	S-C	2454	F-D	S-U
2353	F-E	S-C	2402	F-E	S-D	2456	F-E	S-D
2354	F-E	S-D	2403	F-E	S-D	2457	F-E	S-D
2356	F-E	S-D	2404	F-E	S-D	2458	F-E	S-D
2357	F-E	S-C	2405	F-E	S-D	2459	F-E	S-D
2358	F-E	S-D	2406	F-E	S-D	2460	F-E	S-D
2359	F-E	S-C	2407	F-E	S-C	2461	F-E	S-D
2360	F-E	S-D	2409	F-E	S-D	2463	F-G	S-O
2361	F-E	S-C	2410	F-E	S-D	2464	F-A	S-Q
2362	F-E	S-D	2411	F-E	S-D	2465	F-A	S-Q
2363	F-E	S-D	2412	F-E	S-D	2466	F-G	S-Q
2364	F-E	S-D	2413	F-E	S-D	2468	F-A	S-Q
2366	F-E	S-D	2414	F-E	S-D	2469	F-H	S-Q
2367	F-E	S-D	2416	F-E	S-D	2470	F-A	S-A
2368	F-E	S-E	2417	F-C	S-U	2471	F-A	S-A

UN No.	EmS Fire	EmS Spill	UN No.	EmS Fire	EmS Spill	UN No.	EmS Fire	EmS Spill
2473	F-A	S-A	2531	F-A	S-B	2602	F-C	S-V
2474	F-A	S-A	2533	F-A	S-A	2603	F-E	S-D
2475	F-A	S-B	2534	F-D	S-U	2604	F-E	S-C
2477	F-E	S-D	2535	F-E	S-C	2605	F-E	S-D
2478	F-E	S-D	2536	F-E	S-D	2606	F-E	S-D
2480	F-E	S-D	2538	F-A	S-G	2607	F-E	S-D
2481	F-E	S-D	2541	F-E	S-E	2608	F-E	S-D
2482	F-E	S-D	2542	F-A	S-A	2609	F-A	S-A
2483	F-E	S-D	2545	F-G	S-M	2610	F-E	S-C
2484	F-E	S-D	2546	F-G	S-M	2611	F-E	S-D
2485	F-E	S-D	2547	F-G	S-Q	2612	F-E	S-D
2486	F-E	S-D	2548	F-C	S-W	2614	F-E	S-D
2487	F-E	S-D	2552	F-A	S-A	2615	F-E	S-D
2488	F-E	S-D	2554	F-E	S-D	2616	F-E	S-D
2490	F-A	S-A	2555	F-B	S-J	2617	F-E	S-D
2491	F-A	S-B	2556	F-B	S-J	2618	F-E	S-D
2493	F-E	S-C	2557	F-B	S-J	2619	F-E	S-C
2495	F-A	S-Q	2558	F-E	S-D	2620	F-E	S-D
2496	F-A	S-B	2560	F-E	S-D	2621	F-E	S-D
2498	F-E	S-D	2561	F-E	S-D	2622	F-E	S-D
2501	F-A	S-A	2564	F-A	S-B	2623	F-A	S-I
2502	F-E	S-C	2565	F-A	S-B	2624	F-G	S-O
2503	F-A	S-B	2567	F-A	S-A	2626	F-A	S-Q
2504	F-A	S-A	2570	F-A	S-A	2627	F-A	S-Q
2505	F-A	S-A	2571	F-A	S-B	2628	F-A	S-A
2506	F-A	S-B	2572	F-A	S-A	2629	F-A	S-A
2507	F-A	S-B	2573	F-H	S-Q	2630	F-A	S-A
2508	F-A	S-B	2574	F-A	S-A	2642	F-A	S-A
2509	F-A	S-B	2576	F-A	S-B	2643	F-A	S-A
2511	F-A	S-B	2577	F-A	S-B	2644	F-A	S-A
2512	F-A	S-A	2578	F-A	S-B	2645	F-A	S-A
2513	F-A	S-B	2579	F-A	S-B	2646	F-A	S-A
2514	F-E	S-D	2580	F-A	S-B	2647	F-A	S-A
2515	F-A	S-A	2581	F-A	S-B	2648	F-A	S-A
2516	F-A	S-A	2582	F-A	S-B	2649	F-A	S-A
2517	F-D	S-U	2583	F-A	S-B	2650	F-A	S-A
2518	F-A	S-A	2584	F-A	S-B	2651	F-A	S-A
2520	F-E	S-D	2585	F-A	S-B	2653	F-A	S-A
2521	F-E	S-D	2586	F-A	S-B	2655	F-A	S-A
2522	F-A	S-A	2587	F-A	S-A	2656	F-A	S-A
2524	F-E	S-D	2588	F-A	S-A	2657	F-A	S-A
2525	F-A	S-A	2589	F-E	S-D	2659	F-A	S-A
2526	F-E	S-C	2590	F-A	S-A	2660	F-A	S-A
2527	F-E	S-D	2591	F-C	S-V	2661	F-A	S-A
2528	F-E	S-D	2599	F-C	S-V	2664	F-A	S-A
2529	F-E	S-C	2601	F-D	S-U	2667	F-A	S-A

UN No.	EmS Fire	EmS Spill	UN No.	EmS Fire	EmS Spill	UN No.	EmS Fire	EmS Spill
2668	F-A	S-A	2729	F-A	S-A	2788	F-A	S-A
2669	F-A	S-A	2730	F-A	S-A	2789	F-E	S-C
2670	F-A	S-B	2732	F-A	S-A	2790	F-A	S-B
2671	F-A	S-A	2733	F-E	S-C	2793	F-G	S-J
2672	F-A	S-B	2734	F-E	S-C	2794	F-A	S-B
2673	F-A	S-A	2735	F-A	S-B	2795	F-A	S-B
2674	F-A	S-A	2738	F-A	S-A	2796	F-A	S-B
2676	F-D	S-U	2739	F-A	S-B	2797	F-A	S-B
2677	F-A	S-B	2740	F-E	S-C	2798	F-A	S-B
2678	F-A	S-B	2741	F-H	S-Q	2799	F-A	S-B
2679	F-A	S-B	2742	F-E	S-C	2800	F-A	S-B
2680	F-A	S-B	2743	F-E	S-C	2801	F-A	S-B
2681	F-A	S-B	2744	F-E	S-C	2802	F-A	S-B
2682	F-A	S-B	2745	F-A	S-B	2803	F-A	S-B
2683	F-E	S-C	2746	F-A	S-B	2805	F-G	S-N
2684	F-E	S-C	2747	F-A	S-A	2806	F-A	S-O
2685	F-E	S-C	2748	F-A	S-B	2809	F-A	S-B
2686	F-E	S-C	2749	F-E	S-D	2810	F-A	S-A
2687	F-A	S-G	2750	F-A	S-A	2811	F-A	S-A
2688	F-A	S-A	2751	F-A	S-B	2813 I	F-G	S-N
2689	F-A	S-A	2752	F-E	S-D	2813 II	F-G	S-N
2690	F-A	S-A	2753	F-A	S-A	2813 III	F-G	S-N
2691	F-A	S-B	2754	F-A	S-A	2814	F-A	S-T
2692	F-A	S-B	2757	F-A	S-A	2815	F-A	S-B
2693	F-A	S-B	2758	F-E	S-D	2817	F-A	S-B
2698	F-A	S-B	2759	F-A	S-A	2818	F-A	S-B
2699	F-A	S-B	2760	F-E	S-D	2819	F-A	S-B
2705	F-A	S-B	2761	F-A	S-A	2820	F-A	S-B
2707	F-E	S-D	2762	F-E	S-D	2821	F-A	S-A
2709	F-E	S-D	2763	F-A	S-A	2822	F-A	S-A
2710	F-E	S-D	2764	F-E	S-D	2823	F-A	S-B
2713	F-A	S-A	2771	F-A	S-A	2826	F-E	S-C
2714	F-A	S-I	2772	F-E	S-D	2829	F-A	S-B
2715	F-A	S-I	2775	F-A	S-A	2830	F-G	S-N
2716	F-A	S-A	2776	F-E	S-D	2831	F-A	S-A
2717	F-A	S-I	2777	F-A	S-A	2834	F-A	S-B
2719	F-H	S-Q	2778	F-E	S-D	2835	F-G	S-O
2720	F-A	S-Q	2779	F-A	S-A	2837	F-A	S-B
2721	F-H	S-Q	2780	F-E	S-D	2838	F-E	S-D
2722	F-A	S-Q	2781	F-A	S-A	2839	F-A	S-A
2723	F-H	S-Q	2782	F-E	S-D	2840	F-E	S-D
2724	F-A	S-Q	2783	F-A	S-A	2841	F-E	S-D
2725	F-A	S-Q	2784	F-E	S-D	2842	F-E	S-D
2726	F-A	S-Q	2785	F-A	S-A	2844	F-G	S-N
2727	F-A	S-Q	2786	F-A	S-A	2845	F-G	S-M
2728	F-A	S-Q	2787	F-E	S-D	2846	F-G	S-M

UN No.	EmS Fire	EmS Spill	UN No.	EmS Fire	EmS Spill	UN No.	EmS Fire	EmS Spill
2849	F-A	S-A	2921	F-A	S-G	2995	F-E	S-D
2850	F-E	S-E	2922	F-A	S-B	2996	F-A	S-A
2851	F-A	S-B	2923	F-A	S-B	2997	F-E	S-D
2852	F-B	S-J	2924	F-E	S-C	2998	F-A	S-A
2853	F-A	S-A	2925	F-A	S-G	3005	F-E	S-D
2854	F-A	S-A	2926	F-A	S-G	3006	F-A	S-A
2855	F-A	S-A	2927	F-A	S-B	3009	F-E	S-D
2856	F-A	S-A	2928	F-A	S-B	3010	F-A	S-A
2857	F-C	S-V	2929	F-E	S-D	3011	F-E	S-D
2858	F-G	S-G	2930	F-A	S-G	3012	F-A	S-A
2859	F-A	S-A	2931	F-A	S-A	3013	F-E	S-D
2861	F-A	S-A	2933	F-E	S-D	3014	F-A	S-A
2862	F-A	S-A	2934	F-E	S-D	3015	F-E	S-D
2863	F-A	S-A	2935	F-E	S-D	3016	F-A	S-A
2864	F-A	S-A	2936	F-A	S-A	3017	F-E	S-D
2865	F-A	S-B	2937	F-A	S-A	3018	F-A	S-A
2869	F-A	S-B	2940	F-A	S-J	3019	F-E	S-D
2870	F-G	S-M	2941	F-A	S-A	3020	F-A	S-A
2871	F-A	S-A	2942	F-A	S-A	3021	F-E	S-D
2872	F-A	S-A	2943	F-E	S-D	3022	F-E	S-D
2873	F-A	S-A	2945	F-E	S-C	3023	F-E	S-D
2874	F-A	S-A	2946	F-A	S-A	3024	F-E	S-D
2875	F-A	S-A	2947	F-E	S-D	3025	F-E	S-D
2876	F-A	S-A	2948	F-A	S-A	3026	F-A	S-A
2878	F-G	S-G	2949	F-A	S-B	3027	F-A	S-A
2879	F-A	S-B	2950	F-G	S-O	3028	F-A	S-B
2880	F-H	S-Q	2956	F-B	S-G	3048	F-A	S-A
2881	F-G	S-M	2965	F-G	S-O	3054	F-E	S-D
2900	F-A	S-T	2966	F-A	S-A	3055	F-A	S-B
2901	F-C	S-W	2967	F-A	S-B	3056	F-E	S-D
2902	F-A	S-A	2968	F-G	S-L	3057	F-C	S-U
2903	F-E	S-D	2969	F-A	S-A	3064	F-E	S-D
2904	F-A	S-B	2977	F-I	S-S	3065	F-E	S-D
2905	F-A	S-B	2978	F-I	S-S	3066	F-A	S-B
2907	F-A	S-J	2983	F-E	S-D	3070	F-C	S-V
2908	F-I	S-S	2984	F-H	S-Q	3071	F-E	S-D
2909	F-I	S-S	2985	F-E	S-C	3072	F-A	S-V
2910	F-I	S-S	2986	F-E	S-C	3073	F-E	S-C
2911	F-I	S-S	2987	F-A	S-B	3077	F-A	S-F
2912	F-I	S-S	2988	F-G	S-N	3078	F-G	S-O
2913	F-I	S-S	2989	F-A	S-G	3079	F-E	S-D
2915	F-I	S-S	2990	F-A	S-V	3080	F-E	S-D
2916	F-I	S-S	2991	F-E	S-D	3082	F-A	S-F
2917	F-I	S-S	2992	F-A	S-A	3083	F-C	S-W
2919	F-I	S-S	2993	F-E	S-D	3084	F-A	S-Q
2920	F-E	S-C	2994	F-A	S-A	3085	F-A	S-Q

UN No.	EmS Fire	EmS Spill
3086	F-A	S-Q
3087	F-A	S-Q
3088	F-A	S-J
3089	F-G	S-G
3090	F-A	S-I
3091	F-A	S-I
3092	F-E	S-D
3093	F-A	S-Q
3094	F-G	S-L
3095	F-A	S-N
3096	F-G	S-L
3097	F-A	S-Q
3098	F-A	S-Q
3099	F-A	S-Q
3100	F-A	S-Q
3101	F-J	S-R
3102	F-J	S-R
3103	F-J	S-R
3104	F-J	S-R
3105	F-J	S-R
3106	F-J	S-R
3107	F-J	S-R
3108	F-J	S-R
3109	F-J	S-R
3110	F-J	S-R
3111	F-F	S-R
3112	F-F	S-R
3113	F-F	S-R
3114	F-F	S-R
3115	F-F	S-R
3116	F-F	S-R
3117	F-F	S-R
3118	F-F	S-R
3119	F-F	S-R
3120	F-F	S-R
3121	F-G	S-L
3122	F-A	S-Q
3123	F-G	S-N
3124	F-A	S-J
3125	F-G	S-N
3126	F-A	S-J
3127	F-A	S-J
3128	F-A	S-J
3129 I	F-G	S-N
3129 II	F-G	S-N
3129 III	F-G	S-N
3130 I	F-G	S-N
3130 II	F-G	S-N
3131 I	F-G	S-L
3131 II	F-G	S-L
3131 III	F-G	S-L
3132 I	F-G	S-N
3132 II	F-G	S-N
3132 III	F-G	S-N
3133	F-G	S-L
3134 I	F-G	S-N
3134 II	F-G	S-N
3134 III	F-G	S-N
3135 I	F-G	S-N
3135 II	F-G	S-N
3135 III	F-G	S-N
3136	F-C	S-V
3137	F-G	S-Q
3138	F-D	S-U
3139	F-A	S-Q
3140	F-A	S-A
3141	F-A	S-A
3142	F-A	S-A
3143	F-A	S-A
3144	F-A	S-A
3145	F-A	S-B
3146	F-A	S-A
3147	F-A	S-B
3148 I	F-G	S-N
3148 II	F-G	S-N
3148 III	F-G	S-N
3149	F-H	S-Q
3150	F-D	S-U
3151	F-A	S-A
3152	F-A	S-A
3153	F-D	S-U
3154	F-D	S-U
3155	F-A	S-A
3156	F-C	S-W
3157	F-C	S-W
3158	F-C	S-V
3159	F-C	S-V
3160	F-D	S-U
3161	F-D	S-U
3162	F-C	S-U
3163	F-C	S-V
3164	F-C	S-V
3165	F-E	S-C
3166 (for gases)	F-D	S-U
3166 (for liquids)	F-E	S-E
3167	F-D	S-U
3168	F-D	S-U
3169	F-C	S-U
3170	F-G	S-P
3171	F-A	S-I
3172	F-A	S-A
3174	F-A	S-J
3175	F-A	S-I
3176	F-A	S-H
3178	F-A	S-G
3179	F-A	S-G
3180	F-A	S-G
3181	F-A	S-I
3182	F-A	S-G
3183	F-A	S-J
3184	F-A	S-J
3185	F-A	S-J
3186	F-A	S-J
3187	F-A	S-J
3188	F-A	S-J
3189	F-G	S-J
3190	F-A	S-J
3191	F-A	S-J
3192	F-A	S-J
3194	F-G	S-M
3200	F-G	S-M
3205	F-A	S-J
3206	F-A	S-J
3208 I	F-G	S-N
3208 II	F-G	S-N
3208 III	F-G	S-N
3209 I	F-G	S-N
3209 II	F-G	S-N
3209 III	F-G	S-N
3210	F-H	S-Q
3211	F-H	S-Q
3212	F-H	S-Q
3213	F-H	S-Q
3214	F-H	S-Q
3215	F-A	S-Q
3216	F-A	S-Q

UN No.	EmS Fire	EmS Spill	UN No.	EmS Fire	EmS Spill	UN No.	EmS Fire	EmS Spill
3218	F-A	S-Q	3264	F-A	S-B	3310	F-C	S-W
3219	F-A	S-Q	3265	F-A	S-B	3311	F-C	S-W
3220	F-C	S-V	3266	F-A	S-B	3312	F-D	S-U
3221	F-J	S-G	3267	F-A	S-B	3313	F-A	S-J
3222	F-J	S-G	3268	F-B	S-X	3314	F-A	S-I
3223	F-J	S-G	3269	F-E	S-D	3315	F-A	S-A
3224	F-J	S-G	3270	F-A	S-I	3316	F-A	S-P
3225	F-J	S-G	3271	F-E	S-D	3317	F-B	S-J
3226	F-J	S-G	3272	F-E	S-D	3318	F-C	S-U
3227	F-J	S-G	3273	F-E	S-D	3319	F-B	S-J
3228	F-J	S-G	3274	F-E	S-C	3320	F-A	S-B
3229	F-J	S-G	3275	F-E	S-D	3321	F-I	S-S
3230	F-J	S-G	3276	F-A	S-A	3322	F-I	S-S
3231	F-F	S-K	3277	F-A	S-B	3323	F-I	S-S
3232	F-F	S-K	3278	F-A	S-A	3324	F-I	S-S
3233	F-F	S-K	3279	F-E	S-D	3325	F-I	S-S
3234	F-F	S-K	3280	F-A	S-A	3326	F-I	S-S
3235	F-F	S-K	3281	F-A	S-A	3327	F-I	S-S
3236	F-F	S-K	3282	F-A	S-A	3328	F-I	S-S
3237	F-F	S-K	3283	F-A	S-A	3329	F-I	S-S
3238	F-F	S-K	3284	F-A	S-A	3330	F-I	S-S
3239	F-F	S-K	3285	F-A	S-A	3331	F-I	S-S
3240	F-F	S-K	3286	F-E	S-C	3332	F-I	S-S
3241	F-J	S-G	3287	F-A	S-A	3333	F-I	S-S
3242	F-J	S-G	3288	F-A	S-A	3336	F-E	S-D
3243	F-A	S-A	3289	F-A	S-B	3337	F-C	S-V
3244	F-A	S-B	3290	F-A	S-B	3338	F-C	S-V
3245	F-A	S-T	3291	F-A	S-T	3339	F-C	S-V
3246	F-A	S-B	3292	F-G	S-P	3340	F-C	S-V
3247	F-A	S-Q	3293	F-A	S-A	3341	F-A	S-J
3248	F-E	S-D	3294	F-E	S-D	3342	F-A	S-J
3249	F-A	S-A	3295	F-E	S-D	3343	F-E	S-Y
3250	F-A	S-B	3296	F-C	S-V	3344	F-B	S-J
3251	F-F	S-G	3297	F-C	S-V	3345	F-A	S-A
3252	F-D	S-U	3298	F-C	S-V	3346	F-E	S-D
3253	F-A	S-B	3299	F-C	S-V	3347	F-E	S-D
3254	F-A	S-M	3300	F-D	S-U	3348	F-A	S-A
3255	F-A	S-M	3301	F-A	S-J	3349	F-A	S-A
3256	F-E	S-D	3302	F-A	S-A	3350	F-E	S-D
3257	F-A	S-P	3303	F-C	S-W	3351	F-E	S-D
3258	F-A	S-P	3304	F-C	S-U	3352	F-A	S-A
3259	F-A	S-B	3305	F-D	S-U	3354	F-D	S-U
3260	F-A	S-B	3306	F-C	S-W	3355	F-D	S-U
3261	F-A	S-B	3307	F-C	S-W	3356	F-H	S-Q
3262	F-A	S-B	3308	F-C	S-U	3357	F-E	S-Y
3263	F-A	S-B	3309	F-D	S-U	3358	F-D	S-U

UN No.	EmS Fire	EmS Spill	UN No.	EmS Fire	EmS Spill	UN No.	EmS Fire	EmS Spill
3359	F-A	S-D	3399 II	F-G	S-N	3448	F-A	S-A
3360	F-A	S-I	3399 III	F-G	S-N	3449	F-A	S-A
3361	F-A	S-B	3400	F-A	S-J	3450	F-A	S-A
3362	F-E	S-C	3401	F-G	S-N	3451	F-A	S-A
3363	F-A	S-P	3402	F-G	S-N	3452	F-A	S-A
3364	F-B	S-J	3403	F-G	S-L	3453	F-A	S-B
3365	F-B	S-J	3404	F-G	S-L	3454	F-A	S-A
3366	F-B	S-J	3405	F-H	S-Q	3455	F-A	S-B
3367	F-B	S-J	3406	F-H	S-Q	3456	F-A	S-B
3368	F-B	S-J	3407	F-H	S-Q	3457	F-A	S-A
3369	F-B	S-J	3408	F-H	S-Q	3458	F-A	S-A
3370	F-B	S-J	3409	F-A	S-A	3459	F-A	S-A
3371	F-E	S-D	3410	F-A	S-A	3460	F-A	S-A
3373	F-A	S-T	3411	F-A	S-A	3462	F-A	S-A
3374	F-D	S-U	3412	F-A	S-B	3463	F-E	S-C
3375	F-H	S-Q	3413	F-A	S-A	3464	F-A	S-A
3376	F-B	S-J	3414	F-A	S-A	3465	F-A	S-A
3377	F-A	S-Q	3415	F-A	S-A	3466	F-A	S-A
3378	F-A	S-Q	3416	F-A	S-A	3467	F-A	S-A
3379	F-E	S-Y	3417	F-A	S-G	3468	F-D	S-U
3380	F-B	S-J	3418	F-A	S-A	3469	F-E	S-C
3381	F-A	S-A	3419	F-A	S-B	3470	F-E	S-C
3382	F-A	S-A	3420	F-A	S-B	3471	F-A	S-B
3383	F-E	S-D	3421	F-A	S-B	3472	F-A	S-B
3384	F-E	S-D	3422	F-A	S-A	3473	F-E	S-D
3385	F-G	S-N	3423	F-A	S-B	3474	F-B	S-J
3386	F-G	S-N	3424	F-A	S-A	3475	F-E	S-E
3387	F-A	S-Q	3425	F-A	S-B	3476	F-G	S-P
3388	F-A	S-Q	3426	F-A	S-A	3477	F-A	S-B
3389	F-A	S-B	3427	F-A	S-A	3478	F-D	S-U
3390	F-A	S-B	3428	F-A	S-A	3479	F-D	S-U
3391	F-G	S-M	3429	F-A	S-A	3480	F-A	S-I
3392	F-G	S-M	3430	F-A	S-A	3481	F-A	S-I
3393	F-G	S-M	3431	F-A	S-A	3482	F-G	S-N
3394	F-G	S-M	3432	F-A	S-A	3483	F-E	S-D
3395 I	F-G	S-N	3434	F-A	S-A	3484	F-E	S-C
3395 II	F-G	S-N	3436	F-A	S-A	3485	F-H	S-Q
3395 III	F-G	S-N	3437	F-A	S-A	3486	F-H	S-Q
3396 I	F-G	S-N	3438	F-A	S-A	3487	F-H	S-Q
3396 II	F-G	S-N	3439	F-A	S-A	3488	F-E	S-D
3396 III	F-G	S-N	3440	F-A	S-A	3489	F-E	S-D
3397 I	F-G	S-N	3441	F-A	S-A	3490	F-G	S-N
3397 II	F-G	S-N	3442	F-A	S-A	3491	F-G	S-N
3397 III	F-G	S-N	3443	F-A	S-A	3494	F-E	S-E
3398 I	F-G	S-N	3444	F-A	S-A	3495	F-A	S-B
3398 II	F-G	S-N	3445	F-A	S-A	3496	F-A	S-I
3398 III	F-G	S-N	3446	F-A	S-A	3497	F-A	S-J
3399 I	F-G	S-N	3447	F-A	S-A	3498	F-A	S-B

UN No.	EmS Fire	EmS Spill	UN No.	EmS Fire	EmS Spill	UN No.	EmS Fire	EmS Spill
3499	F-A	S-I	3517	F-D	S-U	3534	F-F	S-K
3500	F-C	S-V	3518	F-C	S-W	3535	F-A	S-G
3501	F-D	S-U	3519	F-C	S-U	3535	F-A	S-G
3502	F-C	S-V	3520	F-C	S-W	3536	F-A	S-I
3503	F-C	S-V	3521	F-C	S-U	3537	F-D	S-U
3504	F-D	S-U	3522	F-D	S-U	3538	F-C	S-V
3505	F-D	S-U	3523	F-D	S-U	3539	F-C	S-U
3506	F-A	S-B	3524	F-C	S-U	3540	F-E	S-D
3507	F-I	S-S	3525	F-D	S-U	3541	F-A	S-G
3508	F-A	S-I	3526	F-D	S-U	3542	*	*
3510	F-D	S-U	3527	F-A	S-G	3543	F-G	S-N
3511	F-C	S-V	3528	F-E	S-E	3544	F-A	S-Q
3512	F-C	S-U	3529	F-D	S-U	3545	F-J	S-R
3513	F-C	S-W	3530	F-A	S-F	3546	F-A	S-A
3514	F-D	S-U	3531	F-J	S-G	3547	F-A	S-B
3515	F-C	S-W	3532	F-J	S-G	3548	F-A	S-P
3516	F-C	S-U	3533	F-F	S-K			

* F-G, S-M for pyrophoric substances, F-A, S-J for self-heating substances