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**Group of Experts for the revision of the IMO/ILO/UNECE
Guidelines for Packing of Cargo Transport Units**

First session

Geneva, 6–7 October 2011

Item 6 of the provisional agenda

Other business

**Amendments to the IMO/ILO/UNECE Guidelines for
packing of cargo transport units approved by the Maritime
Safety Committee of IMO**

Note by the secretariat

1. Reference is made to the terms of reference of the Group of Experts, Chapter 1 "Historical background" and Chapter 2 "Objectives of the Group of Experts" (informal document EG GPC No. 3 (2011)).
2. At its eighty-ninth session from 11 to 20 May 2011, the Maritime Safety Committee of IMO (MSC) approved the draft amendments to the IMO/ILO/UNECE Guidelines for packing of cargo transport units that had been made by the E and T Group of the Sub-Committee on Dangerous Goods, Solid Cargoes and Containers (DSC), and which covered the part of the guidelines on dangerous goods.
3. According to its objectives, the Group of Experts will be asked to take these amendments into account when preparing a revised version of the Guidelines.
4. As part of the working material for the Group of Experts, the secretariat reproduces below Annex 10 to the report of MSC on its eighty-ninth session, including the above mentioned amendments.

ANNEX 10**AMENDMENTS TO THE IMO/ILO/UNECE GUIDELINES
FOR PACKING OF CARGO TRANSPORT UNITS (CTUs)****SCOPE**

- 1 The existing text of this section is replaced by the following:

"These Guidelines are essential to the safe packing of cargo transport units by those responsible for the packing and securing of the cargo and by those whose task it is to train people to pack such units. However, they are not exhaustive and other sources of information may be relevant. Training is essential if safety standards are to be maintained. These Guidelines detail practical measures to ensure the safe packing of cargo onto or into cargo transport units. As such they are concerned with issues of safety and are not intended to address practical measures to enhance security, *per se*.

These Guidelines are not intended to conflict with, or to replace or supersede, any existing regulations or recommendations which may concern the carriage of cargo in cargo transport units. They do not cover the filling or emptying of tank containers, portable tanks or road tank vehicles, or the transport of any cargo in bulk containers.

Guidance on the security aspects of the movement of cargo transport units intended for carriage by sea may be found in a variety of documents including the International Convention for the Safety of Life at Sea (SOLAS), 1974, as amended; the International Ship and Port Facility Security (ISPS) Code; the ILO/IMO Code of Practice on Security in Ports; and the Standards and the Publicly Available Specifications developed or being developed by the International Standards Organization (ISO) to address cargo security management and other aspects of supply chain security. Furthermore, the World Customs Organization (WCO) has developed a SAFE Framework of standards to secure and facilitate global trade.

However, it is important to bear in mind that all personnel involved in the transport chain have a significant role to play enhancing safety and security, not only in the prevention of unlawful acts. Significant financial losses are incurred through theft of cargo and the costs must ultimately be borne by customers and end users through increased insurance and transport costs. The trafficking of illicit drugs has a detrimental effect on society. The movement of weapons in contravention of national laws and internationally agreed arms embargoes; the illegal migration and human trafficking; the smuggling of nuclear materials and precursors for weapons of mass destruction; protection of national revenues; environmental and cultural concerns, and the need to deprive terrorist organizations of funding are all issues of relevance to the transport of cargo transport units. Furthermore, cargo handlers' and transporters' lives are lost and environments are damaged through the transport of undeclared, improperly described and unsafely packed dangerous goods.

It is therefore, extremely important that all personnel involved in the packing, security sealing, handling, transport and processing of cargo should be made aware of the need for vigilance and the diligent application of practical procedures to enhance security, in accordance with national legislation and international agreements."

4 ADDITIONAL ADVICE ON THE PACKING AND SECURING OF DANGEROUS CARGOES

2 The existing title and the text of section 4 is replaced by the following:

"4 ADVICE ON THE PACKING AND SECURING OF DANGEROUS GOODS

4.1 General

4.1.1 The advice of this section applies to cargo transport units in which dangerous goods are packed. It should be followed in addition to the advice given elsewhere in these Guidelines.

4.1.2 International (and often national) transport of dangerous goods may be subject to several dangerous goods transport regulations, depending on the origin, final destination and the modes of transport used.

4.1.3 For intermodal transport, involving several modes of transport other than by sea, the rules and regulations applicable depend on whether it is a national movement or international transport or transport within a political or economic union or trading zone.

4.1.4 Transport of dangerous goods by road, rail or inland waterways may be subject to various regulations and agreements. Examples are:

- .1 European Agreement concerning the International Carriage of Dangerous Goods by Road (ADR);
- .2 Regulations concerning the International Carriage of Dangerous Goods by Rail (RID); and
- .3 Title 49 of the Code of Federal Regulations of the United States.

4.1.5 Most national and international regulations are based on the United Nations Recommendations on the Transport of Dangerous Goods (Orange Book). However, national rules, applicable to domestic transport, may differ from international regulations.

4.1.6 For maritime transport, the provisions of the International Maritime Dangerous Goods (IMDG)¹ Code apply. The IMDG Code provides detailed provisions on all aspects of the transport of packaged dangerous goods by sea. Special attention is drawn to the following chapters of the IMDG Code:

- .1 1.3 Training
- .2 1.4 Security provisions
- .3 5.1 General provisions for consignment procedures
- .4 5.2 Marking and labelling of packages
- .5 5.3 Placarding and marking of cargo transport units
- .6 5.4 Documentation
- .7 7.1 Stowage

¹ International Maritime Dangerous Goods (IMDG) Code, Amendment (35-10), published by the International Maritime Organization (IMO).

.8	7.2	Segregation
.9	7.4	Transport of cargo transport units on board ships
.10	7.5	Packing of cargo transport units
.11	7.7	Temperature control provisions

4.1.7 Dangerous goods are classified as stated below. Some of these classes are subdivided into divisions. The shipper is responsible that packages with dangerous goods bear the appropriate labels and marks.

Class 1 – Explosives

Division 1.1: Substances and articles which have a mass explosion hazard

Division 1.2: Substances and articles which have a projection hazard but not a mass explosion hazard

Division 1.3: Substances and articles which have a fire hazard and either a minor blast hazard or a minor projection hazard or both, but not a mass explosion hazard

Division 1.4: Substances and articles which present no significant hazard

Division 1.5: Very insensitive substances which have a mass explosion hazard

Division 1.6: Extremely insensitive articles which do not have a mass explosion hazard



(No.1)

Divisions 1.1, 1.2 and 1.3



(No.1.4)

Division 1.4



(No.1.5)

Division 1.5



(No.1.6)

Division 1.6

** Place for division – to be left blank if explosive is the subsidiary risk.

* Place for compatibility group – to be left blank if explosive is the subsidiary risk.

Class 2 – Gases: compressed, liquefied or dissolved under pressure

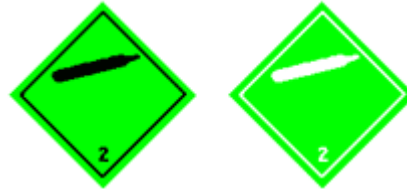
Class 2.1 – Flammable² gases

Class 2.2 – Non-flammable, non-toxic gases

Class 2.3 – Toxic³ gases



(No.2.1)
Class 2.1
Flammable gases



(No.2.2)
Class 2.2.
Non-flammable, non-toxic gases



(No.2.3)
Class 2.3
Toxic gases

Class 3 – Flammable liquids



(No.3)

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

Class 4.1 – Flammable solids, self-reactive substances and solid desensitized explosives

Class 4.2 – Substances liable to spontaneous combustion

Class 4.3 – Substances which, in contact with water, emit flammable gases

² "inflammable" has the same meaning as "flammable".

³ "poisonous" has the same meaning as "toxic".



(No.4.1)
Class 4.1
Flammable solids



(No.4.2)
Class 4.2
***Substances liable to
spontaneous combustion***



(No.4.3)
Class 4.3
***Substances which, in contact
with water, emit flammable
gases***

Class 5 – Oxidizing substances and organic peroxides

Class 5.1 – Oxidizing substances

Class 5.2 – Organic peroxides



(No.5.1)
Class 5.1
Oxidizing substances



(No.5.2)
Class 5.2
Organic peroxides



Class 6 – Toxic and infectious substances

Class 6.1 – Toxic substances

Class 6.2 – Infectious substances



(No.6.1)
Class 6.1
Toxic substances



(No.6.2)
Class 6.2
Infectious substances

Class 7 – Radioactive materials



(No.7A)
Category I – White



(No.7B)
Category II – Yellow



(No.7C)
Category III – Yellow



(No.7E)
Class 7
Fissile material

Class 8 – Corrosives



(No.8)

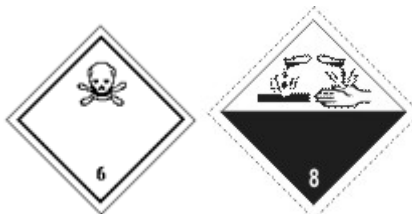
Class 9 – Miscellaneous dangerous substances and articles and environmentally hazardous substances



(No.9)

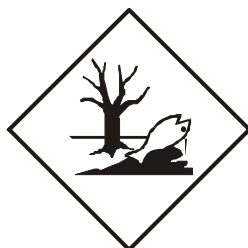
Subsidiary risks

Some substances or articles can exhibit more than one hazard. In these cases additional label(s) for the subsidiary risks are required, e.g., class 6.1 with subsidiary risk 8



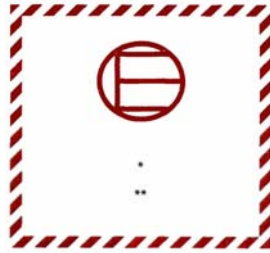
Environmentally Hazardous Substances (Aquatic environment)

For maritime transport these substances are known as marine pollutants and subject to the provisions of Annex III of MARPOL 73/78, as amended



4.1.8 Limited quantities and excepted quantities

Under certain conditions the IMDG Code provides exemptions from some requirements if the dangerous goods are transported in "limited quantities" or "excepted quantities". Packages to which these exemptions apply, are marked as follows:



4.1.9 There may be other marks in addition to 4.1.7 and 4.1.8 of these Guidelines as required by the IMDG Code.

4.2 Before packing

4.2.1 The IMDG Code and other international and national regulations require that the shipper provides transport information on each dangerous substance, material or article. This information shall include at least the following basic item:

- .1 the UN Number;
- .2 the Proper Shipping Name (including the technical name, as applicable);
- .3 the class and/or division (and the compatibility group letter for goods of class 1);
- .4 subsidiary risks when assigned;
- .5 the packing group when assigned;
- .6 the total quantity of dangerous goods (by volume or mass, and for explosives the net explosive content); and
- .7 the number and kind of packages.

Other items of information may be required, depending on the mode of transport and the classification of the goods (e.g., flashpoint for transport by sea). The various items of information required under each regulation and applicable during intermodal transport operations should be provided so that appropriate documentation may be prepared for each shipment.

4.2.2 The shipper should also ensure that dangerous goods are classified, packaged, packed, marked, labelled, placarded and provided with the required signs, in accordance with the applicable regulations. A declaration by the shipper that this has been carried out is normally required. Such a declaration may be included with the required transport information.

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- 4.2.3** The shipper should also ensure that the goods to be transported are authorized for transport by the modes to be used during the transport operation. For example, self-reacting substances and organic peroxides requiring temperature control are not authorized for transport by rail under the RID regime. Certain types of dangerous goods are not authorized to be transported on board passenger ships and therefore the requirements of the IMDG Code should be carefully studied.
- 4.2.4** Current versions of all applicable regulations should be easily accessible and referred to during packing to ensure compliance.
- 4.2.5** Dangerous goods should only be handled, packed and secured by trained personnel. Supervision by a responsible person who is familiar with the legal provisions, the risks involved and the measures that should be taken in an emergency is required.
- 4.2.6** Suitable measures to prevent fires should be taken, including the prohibition of smoking in the vicinity of dangerous goods.
- 4.2.7** Packages of dangerous goods should be examined and any found to be damaged, leaking or sifting should not be packed. Packages showing evidence of staining, etc., should not be packed without first determining that it is safe and acceptable to do so. Water, snow, ice or other matter adhering to packages should be removed before packing. Substances that have accumulated on drum heads should initially be treated with caution in case they are the result of leakage or sifting of contents. If pallets have been contaminated by spilt dangerous goods they should be destroyed by appropriate disposal methods to prevent use at a later date.
- 4.2.8** If dangerous goods are palletized or otherwise unitized they should be compacted so as to be regularly shaped, with approximately vertical sides and level at the top. They should be secured in a manner unlikely to damage the individual packages comprising the unit load. The materials used to bond a unit load together should be compatible with the substances unitized and retain their efficiency when exposed to moisture, extremes of temperature and sunlight.
- 4.2.9** An overpack and unit load should be marked with the Proper Shipping Name and the UN Number and marked and labelled, as required for packages, for each item of dangerous goods contained in the overpack or unit load unless markings and labels representative of all dangerous goods in the overpack or unit load are clearly visible. An overpack, in addition, should be marked with the word "OVERPACK" unless markings and labels representatives of all dangerous goods as required for packages in to overpack are visible.
- 4.2.10** The stowage and method of securing of dangerous goods in a cargo transport unit should be planned before packing is commenced.
- 4.3 Packing and securing**
- 4.3.1** Special care should be taken during handling to avoid damage to packages. However, if a package containing dangerous goods is damaged during handling so that the contents leak out, the immediate area should be evacuated until the hazard potential can be assessed. The damaged

package should not be shipped. It should be moved to a safe place in accordance with instructions given by a responsible person who is familiar with the risks involved and knows the measures that should be taken¹ in an emergency.

- 4.3.2** If a leakage of dangerous goods presents safety or health hazards such as explosion, spontaneous combustion, poisoning or similar danger, personnel should immediately be moved to a safe place and the Emergency Response Organization notified.
- 4.3.3** Dangerous goods should not be packed in the same cargo transport unit with incompatible goods. In some instances even goods of the same class are incompatible with each other and should not be packed in the same unit, e.g., acids and alkalis of class 8. The requirements of the IMDG Code concerning the segregation of dangerous goods inside cargo transport units are usually more stringent than those for road and rail transport. Whenever an intermodal transport operation does not include transport by sea, compliance with the respective inland transport regulations may be sufficient. However, if there is any possibility that a part of the transport operation will be by sea, the segregation requirements of the IMDG Code should be strictly complied with.
- 4.3.4** When dangerous goods are being handled, smoking or the consumption of food and drink should be prohibited.
- 4.3.5** Packages marked with orientation arrows should be packed with the arrows pointing upwards. Vented packages should be packed in such a way that the vents will not be blocked.
- 4.3.6** Drums containing dangerous goods should always be stowed in an upright position unless otherwise authorized by the competent Authority.
- 4.3.7** Dangerous goods consignments which form only part of the load of a cargo transport unit should, whenever possible, be packed adjacent to the doors with markings and labels visible. Particular attention is drawn to 3.3.1 concerning the securing of cargo by the doors of a unit.
- 4.3.8** The number of packages containing dangerous goods in excepted quantities in any cargo transport unit is limited to a maximum of 1,000.

4.4 On completion of packing

4.4.1 *Placarding*

- 4.4.1.1** Placards (enlarged labels and marks) as shown in 4.1.7 (minimum size 250 mm x 250 mm) and other signs should be affixed to the exterior surfaces of a cargo transport unit.

¹

The Emergency Response Procedures for Ships Carrying Dangerous Goods (EmS) and the Medical First Aid Guide for Use in Accidents Involving Dangerous Goods (MFAG) in the Supplement of the IMDG Code give further useful advice, but it should be borne in mind that the former may not be appropriate for use on land; emergency response handbooks, giving emergency response information cross-referenced to the United Nations identification number (UN Number) of the substance are usually available at the national level. More information for emergency response action can be found in the appropriate Safety Data Sheet (SDS) which should be available.

4.4.1.2 Cargo transport units containing dangerous goods or residues of dangerous goods should clearly display placards and marks or other signs as follows:

- .1 a freight container or semi trailer, one on each side and one on each end of the unit;
- .2 a railway wagon, at least one on each side; and
- .3 any other cargo transport unit, at least one on both sides and on the back of the unit, unless otherwise specified in the applicable transport regulations.

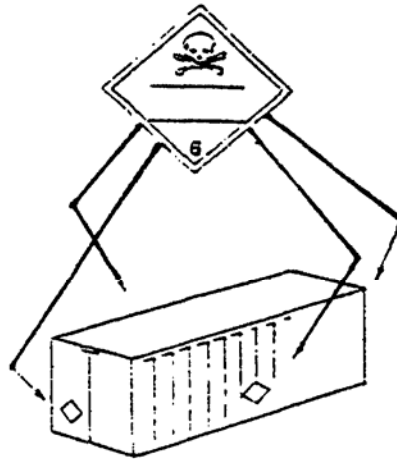


Figure 37 - Placards on a container

Figure 38



Road freight vehicle and full-trailer:
Each unit shall be placarded on both sides and on the rear



Semi-trailer:
The unit shall be placarded on both sides and both ends

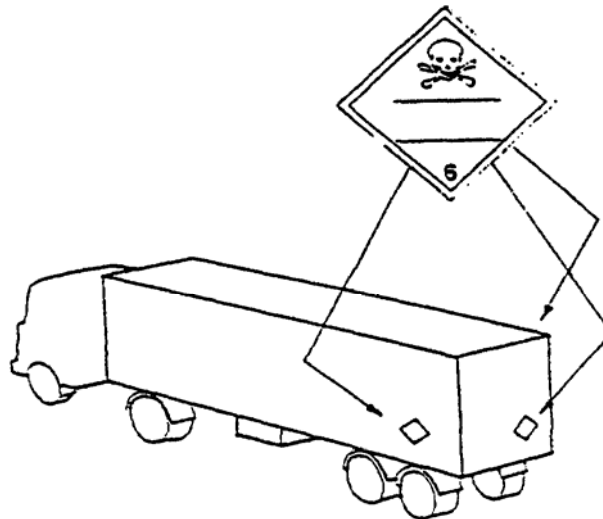
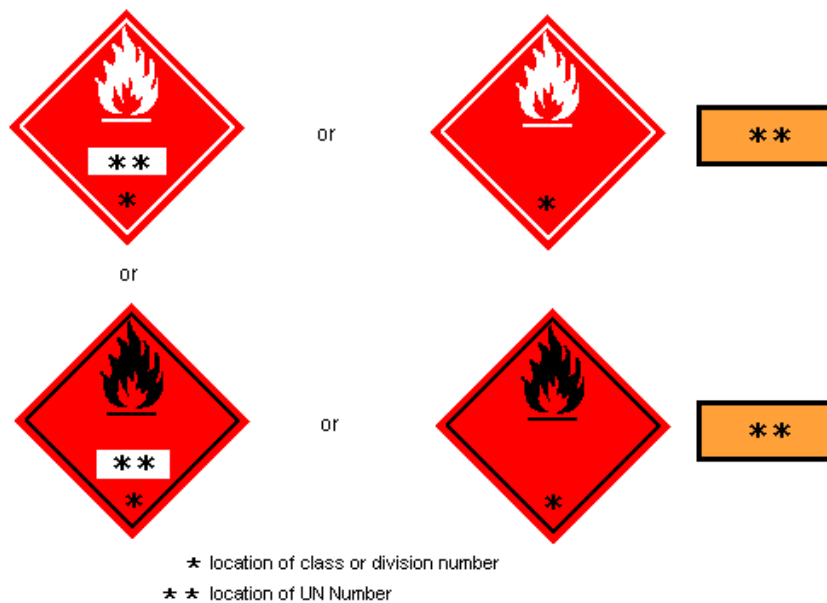


Figure 39 – Placards on a road vehicle

- 4.4.1.3** Whenever dangerous goods present several risks, subsidiary risk placards should be displayed in addition to primary risk placards. However, cargo transport units containing goods of more than one class, need not bear a subsidiary risk placard, if the hazard represented is already indicated by the primary risk placard.
- 4.4.1.4** The IMDG Code requires that, except for goods of Class 1, the UN Number shall be displayed as required in 4.4.1.5 on consignments of:
- .1 packaged dangerous goods loaded in excess of 4,000 kg gross mass, to which only one UN Number has been assigned and which are the only dangerous goods in the cargo transport unit;
 - .2 unpackaged LSA-1 or SCO-1 material of class 7 in or on a vehicle or in a freight container; and
 - .3 packaged radioactive material with a single UN Number under exclusive use in or on a vehicle, or in a freight container.
- 4.4.1.5** The UN Number for the goods shall be displayed in black digits not less than 65 mm high, either:
- .1 against a white background in the area below the pictorial symbol and above the class number and the compatibility group letter in a manner that does not obscure or detract from the other required label elements; or
 - .2 on an orange rectangular panel not less than 120 mm high and 300 mm wide, with a 10 mm black border, to be placed immediately adjacent to each placard or marine pollutant mark. When no placard or marine pollutant mark is required, the UN Number shall be displayed immediately adjacent to the Proper Shipping Name.

Example:



4.4.1.6 For radioactive materials special requirements.

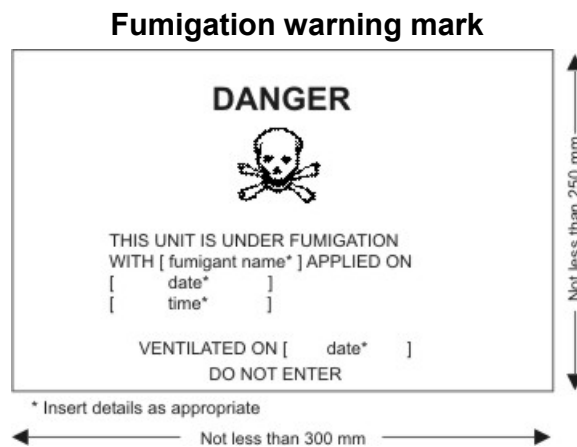
4.4.1.7 When solid carbon dioxide (CO₂ – dry ice) or other expendable refrigerant is used for cooling purposes, a warning sign should be affixed to the outside of the doors so that it is clearly visible to any person operating the doors. The sign should warn of the possibility of an asphyxiating atmosphere. An example of such a warning sign is given-below.

Warning label for dry ice or other expendable refrigerant used for cooling purposes



Note: The text under "WARNING" should refer to the refrigerant gas used.

- 4.4.1.8** When fumigants have been applied to the contents of a container, the marking of the proper shipping name (Fumigated cargo transport unit) and the UN number (UN 3359) are not required. However, if a fumigated unit is loaded with dangerous goods, any label, mark or sign required by the IMDG Code shall be marked on the fumigated cargo transport unit.
- 4.4.1.9** A fumigated cargo transport unit shall be marked with the warning mark, as specified in 4.4.1.10, affixed in a location where it will be easily seen by persons attempting to enter the interior of the unit. The marking, as required by this paragraph, shall remain on the unit until the following provisions are met:
- .1 the fumigated cargo transport unit has been ventilated to remove harmful concentrations of fumigant gas; and
 - .2 the fumigated goods or materials have been unloaded.
- 4.4.1.10** The fumigation warning mark shall be rectangular and shall be not less than 300 mm wide and 250 mm high. The markings shall be in black print on a white background with lettering not less than 25 mm high. The mark should state the fumigant, the method of fumigation employed and the date and time when it took place. An illustration of this mark is given below:



4.4.2 Container/vehicle packing certificate

- 4.4.2.1** When dangerous goods are packed or loaded into any container or vehicle, the IMDG Code and other transport regulations require that those responsible for packing the container or vehicle shall provide a "container/vehicle packing certificate" specifying the container/vehicle identification number(s) and certifying that the operation has been carried out in accordance with the following conditions:
- .1 the container/vehicle was clean, dry and apparently fit to receive the goods;
 - .2 packages which need to be segregated in accordance with applicable segregation requirements have not been packed together onto or in the container/vehicle (unless approved by the competent Authority concerned);

- .3 all packages have been externally inspected for damage, and only sound packages have been loaded;
- .4 drums have been stowed in an upright position, unless otherwise authorized by the competent Authority, and all goods have been properly loaded and, where necessary, adequately braced with securing material to suit the mode(s) of transport for the intended journey;
- .5 for consignments including goods of class 1 other than division 1.4, the container/vehicle is structurally serviceable;
- .6 the container/vehicle and packages are properly marked, labelled and placarded, as appropriate;
- .7 when solid carbon dioxide (CO₂ – dry ice) is used for cooling purposes, the container/vehicle is externally marked or labelled in a conspicuous place, such as, at the door end, with the words: "DANGEROUS CO₂ (DRY ICE) INSIDE. VENTILATE THOROUGHLY BEFORE ENTERING"; and
- .8 a dangerous goods transport document has been received for each dangerous goods consignment loaded in the container/vehicle.

4.4.2.2 The information required in the dangerous goods transport document and the container/vehicle packing certificate may be incorporated into a single document; if not, these documents shall be attached into one another. If the information is incorporated into a single document, the document shall include a signed declaration such as "It is declared that the packing of the goods into the container/vehicle has been carried out in accordance with the applicable provisions". This declaration shall be dated and the person signing this declaration shall be identified on the document. Facsimile signatures are acceptable where applicable laws and regulations recognize the legal validity of such signatures.

4.4.3 If the doors of a cargo transport unit are locked, the means of locking shall be such that, in cases of emergency, the doors can be opened without delay."

5 ADVISE ON RECEIPT OF CARGO TRANSPORT UNITS

- 3 In paragraph 5.3, in the first sentence, the word "cargoes" is replaced by the word "goods".
- 4 In paragraph 5.5, in the third sentence, the word "MARINE POLLUTANT" is replaced by the word "ENVIRONMENTALLY HAZARDOUS SUBSTANCE (AQUATIC ENVIRONMENT)".
- 5 In paragraph 5.7, in the second sentence, the word "cargoes" is replaced with the word "goods".

7 TRAINING IN PACKING OF CARGO IN CTUs

6 Add the following new sentence at the end of paragraph 7.5

7.5 In assistance to maritime institutes and their technical staff in organizing and introducing new training courses, or in enhancing, updating or supplementing existing training material reference is made to the IMO Model Course 3.18 – Safe Packing of Cargo Transport Units (CTUs).

ANNEX 2

LABELS, PLACARDS, MARKS AND SIGNS

7 Annex 2 of the Guidelines is deleted and annexes 3 to 6 are renumbered as annexes 2 to 5.
