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**COMMITTEE OF EXPERTS ON THE TRANSPORT OF
DANGEROUS GOODS AND ON THE GLOBALLY
HARMONIZED SYSTEM OF CLASSIFICATION
AND LABELLING OF CHEMICALS**

Sub-Committee of Experts on the
Transport of Dangerous Goods

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**MISCELLANEOUS PROPOSALS OF AMENDMENTS TO THE MODEL
REGULATIONS ON THE TRANSPORT OF DANGEROUS GOODS**

Transport of coolant/conditioning units

Transmitted by the experts from Germany and the United Kingdom¹

Introduction

1. The Sub-Committee adopted a new text for section 5.5.2 covering the transport of fumigated units for inclusion in the 16th revised edition of the Model Regulations (see ST/SG/AC.10/36/Add.1), but the experts could not agree on a similar text for Cargo Transport Units (CTUs) containing dangerous goods for cooling and conditioning purposes as proposed by the expert of the United Kingdom in ST/SG/AC.10/C.3/2008/9 and ST/SG/AC.10/C.3/2008/90. Units containing substances for cooling and conditioning purposes can pose a safety risk to personnel unfamiliar with dangerous goods regulations or unaccustomed to handling dangerous goods. Though the text for a new section 5.5.3 could not be agreed during the last biennium, many experts expressed general support for the approach.

¹ In accordance with the programme of work of the Sub-Committee for 2009-2010 approved by the Committee at its fourth session (refer to ST/SG/AC.10/C.3/68 para. 118(d) and ST/SG/AC.10/36, para. 14).

2. The previous proposals from the expert from the United Kingdom comprised a warning sign intended to replace the present marking of the units with an inscription. None of the proposed warning signs (see ST/SG/AC.10/C.3/2007/47, ST/SG/AC.10/C.3/2008/9 and informal document UN/SCETDG/34/INF.24) seemed acceptable to the majority of the Sub-Committee. Though the experts from Germany and the United Kingdom agree that a warning sign would be preferable as translation problems could thus be avoided, the proposal below provides for either the symbol that received the most support OR an inscription to avoid that disagreement on the warning sign results in not taking a decision on the proposal at all.

3. The packing instructions in P620, P650, P800, P904 and P901 contain requirements for packages containing UN 1845 or 1977; the marking requirements have to be aligned with the new section 5.5.3.

4. According to special provisions SP 319 and SP 219 in Chapter 3.3, substances packed and marked in accordance with packing instruction P650 or P904 are not subject to any other requirements in the Regulations. As a consequence, it is not clear whether the marking requirement for cargo transport units in SP 297 applies to CTUs containing P650 or P904 packagings; for safety reasons, however, it should apply. Therefore, SP 297 needs to be clarified and SP 219 and SP 319 should be amended accordingly.

5. There was a discussion if the transport of dry ice in unpackaged form is allowed as there is no BK entry in column 13 for any of the mentioned substances (UN 1845, UN 1977 and UN 1951). Unpacked dry ice has a temperature of -78.5°C . When the dry ice comes into direct contact with the structure of a standard freight container, it will render the material brittle and impair the structural safety of the container. Therefore, bulk transport of dry ice should not be authorized. Nevertheless, the use of UN 1845 (dry ice) as a coolant for other goods loaded in the container seems acceptable if appropriate measures are taken to avoid a negative impact on the container. An appropriate measure would be insulation e.g. by planks with a thickness of at least 30 mm.

6. Below are revised proposals from the experts from Germany and the United Kingdom for consideration by the Sub-Committee.

Proposal

7. The following new section 5.5.3 should be included in Chapter 5.5 of the Model Regulations:

“5.5.3 Special provisions applicable to packages and cargo transport units containing substances presenting a risk of asphyxiation when used for cooling or conditioning purposes (such as dry ice (UN 1845) or nitrogen, refrigerated liquid (UN 1977) or argon, refrigerated liquid (UN 1951)).

5.5.3.1 General

5.5.3.1.1 The transport of dangerous goods used for cooling and conditioning in portable tanks is not subject to these Regulations.

5.5.3.1.2 Cargo transport units containing substances used for cooling or conditioning purposes (other than fumigation) are not subject to any provisions of these Regulations other than those of this section.

5.5.3.1.3 When the cooled or conditioned cargo transport unit is loaded with dangerous goods, in addition to the coolant or conditioner, any provision of these Regulations relevant to these dangerous goods (including placarding, marking and documentation) applies in addition to the provisions of this chapter.

5.5.3.1.4 Persons engaged in the handling of cooled or conditioned cargo transport units shall be trained commensurate with their responsibilities.

5.5.3.2 Packages containing a coolant or conditioner

5.5.3.2.1 Packaged dangerous goods requiring cooling or conditioning shall meet the appropriate requirements of the Packing Instruction to which they are assigned (see Packing Instructions P203; P620; P650; P 800; P904; P901)

5.5.3.2.2 Packages shall be designed and constructed to permit the release of gas to prevent a build-up of pressure that could rupture the packaging.

5.5.3.2.3 Packages containing a coolant or conditioner shall be transported in well ventilated cargo transport units.

5.5.3.3 Marking of packages containing a coolant or conditioner

5.5.3.3.1 Packages containing solid carbon dioxide (dry ice) used as a coolant shall be clearly marked with the words "WARNING - UN 1845 CARBON DIOXIDE SOLID (DRY ICE)". For packages containing other dangerous goods used for cooling or conditioning, the UN number preceded by the letters "UN" and the proper shipping name of these dangerous goods shall be marked on the package, in addition to the word "WARNING"

5.5.3.3.2 The markings shall be durable, legible and placed in such a location and of such a size relative to the packaging as to be readily visible.

5.5.3.4 Cargo transport units containing unpackaged coolant or conditioner

5.5.3.4.1 If dry ice in unpackaged form is used for cooling purposes, it shall not come into direct contact with the metal structure of a freight container to avoid embrittlement of the metal. Measures shall be taken to provide adequate insulation between the dry ice and the freight container by providing a minimum of 30mm separation (e.g. by using suitable low heat conducting materials such as timber planks, pallets etc).

5.5.3.4.2 Where dry ice is placed around packages for cooling purposes, measures shall be taken to ensure that packages remain in the original position during transport after the dry ice has dissipated.

5.5.3.5 Marking and placarding of cargo transport units

5.5.3.5.1 Placards related to the risks of the dangerous goods used for cooling or conditioning shall not be affixed to the cargo transport unit containing such coolants or conditioners.

Option 1

5.5.3.5.2 Cargo transport units containing a coolant or conditioner shall be marked with the words “WARNING – contains XXX” where XXX is replaced by the UN number preceded by the letters “UN” and the proper shipping name of these dangerous good as appropriate, for example “WARNING – contains UN 1845 CARBON DIOXIDE SOLID (DRY ICE)”.

Option 2

5.5.3.5.2 Cargo transport units containing dangerous goods used for cooling or conditioning shall be marked with a warning mark, as specified in 5.5.3.5.3 affixed at each access point in a location where it will be easily seen by persons opening or entering the cargo transport unit. This mark shall remain on the cargo transport unit until the following provisions are met:

- (a) The cargo transport unit has been ventilated to remove harmful concentrations of coolant or conditioner; and
- (b) The cooled or conditioned goods have been unloaded.

5.5.3.5.3 The warning mark shall be rectangular and shall not be less than 150 mm wide and 250 mm high. The markings shall be red and black print on a white background with lettering not less than 25 mm high. The warning mark shall include:

- (a) The word “WARNING”; and
- (b) If solid carbon dioxide is used, the text “UN1845 CO2 SOLID (DRY ICE)” or, if other dangerous goods for cooling or conditioning are used, the UN number and proper shipping name of these dangerous goods.

An illustration of this mark is given in Figure 5.5.2

Figure 5.5.2:



5.5.3.6 Documentation

5.5.3.6.1 Documents (such as a bill of lading or cargo manifest) associated with the transport of cargo transport units that have been cooled or conditioned and have not been completely ventilated before transport shall include the following information:

- (a) The UN number preceded by the letters “UN”;
- (b) The proper shipping name;
- (c) The primary hazard class or, when assigned, the division of the goods. The words “class” or “division” may be included preceding the primary hazard class or division numbers.

For example: UN 1845, dry ice, 9

5.5.3.6.2. The transport document may be in any form, provided it contains the information required in 5.5.3.6.1. This information shall be easy to identify, legible and durable.”

Consequential amendments

8. In the Dangerous Goods List, for UN 1977 and UN 1951, add “297” in column 6.
9. Amend the first sentence of SP 219 to read as follows:

“Genetically modified microorganisms (GMMOs) and genetically modified organisms (GMOs) packed and marked in accordance with packing instruction P904 are not subject to any other requirements of the Regulations except those of 5.5.3.2 when relevant.”
10. Replace the existing text of SP 297 by the following text:

“297 For air transport, arrangements between consignor and operator shall be made for each consignment, to ensure that ventilation safety procedures are followed. For marking of packages containing solid carbon dioxide, nitrogen, refrigerated liquid or argon, refrigerated liquid and the marking of the cargo transport units see Chapter 5.5.”
11. Amend SP 319 to read as follows:

“319 Substances packed and marked in accordance with Packing Instruction P 650 are not subject to any other requirements in these Regulations except those of 5.5.3.2 when relevant.”
12. Amend additional requirement 2, paragraphs (b) and (c), of P620 to read as follows:

“(b) Substances consigned refrigerated or frozen. Ice, dry ice or other refrigerant shall be placed around the secondary packaging(s) or alternatively in an overpack with one or more complete packages marked in accordance with 6.3.3. Interior supports shall be provided to secure secondary packaging(s) or packages in position after the ice or dry ice has dissipated. If ice is used, the outer packaging or overpack shall be leakproof. If dry ice is used, the outer packaging or overpack shall permit the release of carbon dioxide gas and shall be marked in accordance with 5.5.3.3. The primary receptacle and the secondary packaging shall maintain their integrity at the temperature of the refrigerant used;

(c) Substances consigned in liquid nitrogen. Plastics primary receptacles capable of withstanding very low temperature shall be used. The secondary packaging shall also be capable of withstanding very low temperatures, and in most cases will need to be fitted over the primary receptacle individually. Provisions for the consignment of liquid nitrogen shall also be fulfilled. The package (the outer packaging or the overpack) shall be marked in accordance with 5.5.3.3. The primary receptacle and the secondary packaging shall maintain their integrity at the temperature of the liquid nitrogen;”

13. Amend P 650, para 9, to read as follows:

“(9) Refrigerated or frozen specimens: Ice, dry ice and liquid nitrogen
(a) When dry ice or liquid nitrogen is used to keep specimens cold, all applicable requirements of these Regulations shall be met. The package (the outer packaging or the overpack) shall be marked “WARNING - UN 1845 CARBON DIOXIDE SOLID (DRY ICE)” or “WARNING - UN 1977 NITROGEN, REFRIGERATED LIQUID”, as applicable. When used, ice or dry ice shall be placed outside the secondary packagings or in the outer packaging or an overpack. Interior supports shall be provided to secure the secondary packagings in the original position after the ice or dry ice has dissipated. If ice is used, the outside packaging or overpack shall be leakproof. If carbon dioxide, solid (dry ice) is used, the packaging shall be designed and constructed to permit the release of carbon dioxide gas to prevent a build-up of pressure that could rupture the packagings.”

14. IN P 800, PP 41, Add the following sentence at the end: “The package (the outer packaging or the overpack) shall be marked in accordance with 5.5.3.3.”

15. At the end of the additional requirement of P901, Add the following sentence: “When carbon dioxide, solid (dry ice) is used, the package (the outer packaging or the overpack) shall be marked “in accordance with 5.5.3.3.”

16. Amend the additional requirement of P904 to read as follows:

“Additional requirement:

Ice, dry ice and liquid nitrogen

When dry ice or liquid nitrogen is used all applicable requirements of these Regulations shall be met. When used, ice or dry ice shall be placed outside the secondary packagings or in the outer packaging or an overpack. Interior supports shall be provided to secure the secondary packaging in the original position after the ice or dry ice has dissipated. If ice is used, the outside packaging or overpack shall be leakproof. If carbon dioxide, solid (dry ice) is used, the packaging shall be designed and constructed to permit the release of carbon dioxide gas to prevent a build-up of pressure that could rupture the packagings. The package (the outer packaging or the overpack) shall be marked “WARNING - UN 1845 CARBON DIOXIDE SOLID (DRY ICE)” or “WARNING - UN 1977 NITROGEN, REFRIGERATED LIQUID”, as applicable.

The primary receptacle and the secondary 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.”
