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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**
(Nineteenth session, 2-6 July 2001,
agenda item 3(b))

TANKS

Miscellaneous proposals

Portable tank requirements

Transmitted by the expert from the United States of America

1. The expert from the United States of America recently completed a comprehensive review of the UN portable tank requirements as part of the process of incorporating these requirements into the national transport of dangerous regulations (49 CFR) of the United States of America. During this process it was found that a number of amendments should be made to the portable tank special provisions in 4.2.4.3 of the Recommendations.

Proposals

Portable tank special provisions (TPs), Section 4.2.4

In the table in paragraph 4.2.4.2.5 "T6" is listed as a permitted alternative for T2 and T4 portable tanks. A T6 portable tank is only required to have two effective means of closure on the bottom outlet and is not required to have an internal shut-off valve. T2 and T4 require 3 effective means of closure on bottom outlets. On this basis, T6 should be removed from the right hand column in the list of permitted tanks for T2 and T4.

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- TP 5 is currently reserved. There are no filling limits currently prescribed for refrigerated liquefied gases. It is proposed that TP 5 be used to specify the degree of filling for refrigerated liquefied gases and that the following text be adopted:

TP5 For a portable tank used for the transport of refrigerated liquefied gases, the maximum rate at which the portable tank may be filled shall not exceed the liquid flow capacity of the primary pressure relief device. The degree of filling shall not exceed 98%.

TP5 should be assigned to each refrigerated liquefied gas that is assigned T75.

- TP6 applies to 4 hydrogen peroxide entries (UN 2014, 2015, 2984 and 3149) and to UN 1991, Chloroprene. The assignment to UN 1991, Chloroprene appears to be an error and should be corrected since TP6 is intended for hydrogen peroxide entries. TP6 indicates that "To prevent the portable tank from bursting in any event including fire engulfment, it shall be provided with adequate pressure relief devices." This statement is superfluous because all portable tanks are required to be fitted with adequate pressure relief devices. TP6 should be deleted.

- TP10 should be amended to allow other suitable portable tank linings that are used for the transport of Bromine (TP10 only applies to UN 1744, Bromine or Bromine solutions). The US Hazardous Materials Regulations also allow nickel cladding as an alternative to a lead lining. The US competent authority has also approved the use of a polyvinylidene fluoride (PVDF) liners on the basis that they provides an equivalent or enhanced level of safety. In order to alleviate the continued need for approving these linings on a case by case basis, the expert from the United States of America is proposing to amend TP 10 to allow other acceptable linings as follows:

TP 10 Portable tanks shall be fitted with a lining on the inside of the portable tank which is either a 5mm thick lead lining, a 4mm thick polyvinylidene fluoride (PVDF) liner or nickel cladding which comprises at a minimum 20% of the required minimum thickness of the tank based on the actual steel used. If nickel cladding is used it shall conform to ASTM B162-69 or equivalent material standards. Other suitable linings approved by the competent authority may be used. Linings shall be tested and inspected at least every 12 months.

- TP 23 should be assigned to UN 1963, Helium, refrigerated liquid. It is currently only assigned to UN 1966, Hydrogen, refrigerated liquid. TP 23 was intended to apply to UN 1963 for the purpose of providing an exception to the rail impact tests. These tanks are typically not transported by rail and the shell supporting framework will not withstand the 4g test conditions.

Portable tank instructions

Some of the columns in the Portable tanks instructions are not very well explained. It is proposed to provide a better explanation of the information provided in the portable tank instruction columns. In 4.2.4.2.6 it is proposed to insert the following text:

Portable tank instructions specify the requirements applicable to a portable tank when used for the transport of specific substances. These requirements shall be met in addition to the design and construction specifications in Part 6. Portable tank instructions T1 through T22 specify the applicable minimum test pressure, the minimum shell thickness (in reference steel), bottom opening requirements and pressure relief requirements.

An asterisk should be included in the header of the pressure relief device column to indicate:

- * When the word "Normal" is indicated all of the requirements of 6.7.2.8 apply except for 6.7.2.8.3.

The following text should be inserted before T50:

Non-refrigerated liquefied gases are assigned to portable tank instruction T50. T50 provides the maximum allowable working pressures, bottom opening requirements, pressure relief requirements and degree of filling requirements for liquefied compressed gases permitted for transport in portable tanks.

An asterisk should be included in the header of the minimum test pressure column to indicate:

- * "small" means a portable tank with a diameter of 1.5 metres or less when measured at the widest part of the shell, "sunshield" means a portable tank with a shield covering at least the upper third of the shell, "bare" means a portable tank where no sunshield or insulation is provided, and "insulated" means a complete cladding of sufficient thickness of insulating material necessary to provide a minimum conductance of not more than $0.67 \text{ W m}^{-2} \text{ K}^{-1}$.

An asterisk should be included in the header of the pressure relief device column to indicate:

- * The word "Normal" in the pressure relief requirements column indicates that a frangible disc as specified in 6.7.3.7.3 is not required.

Part 6

The following definitions should be added in 6.7.2.1:

Fine grain steel means steel which has a ferritic grain size of 6 or finer when determined in accordance with ASTM E 112-96 or as defined in EN 10028-3, Part 3.

Fusible element means a non-reclosable pressure relief device that is thermally actuated that provides protection against excessive pressure build-up within the shell developed by exposure to heat, such as from a fire.

Offshore portable tank means a portable tank specially designed for repeated use for transport of dangerous goods to, from and between offshore facilities. An offshore

portable tank is designed and constructed in accordance with the Guidelines for the Approval of Containers Handled in Open Seas specified in the IMDG Code.

In 6.7.2.4.7 the reference to 12mm should be removed since there are no instances where a 12mm thickness is specified.

In 6.7.3.5.4 there is a reference to a “quick” closing safety device. Quick is a very ambiguous term. The expert from the United States of America proposes the following text as an alternative:

6.7.3.5.4 For filling and discharge bottom openings of portable tanks intended for the transport of flammable and/or toxic non-refrigerated liquefied gases the internal stop-valve shall be a ~~quick~~ **self** closing safety device which closes automatically in the event of unintended movement of the portable tank during filling or discharge or fire engulfment **within 30 minutes of actuation.**
