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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

Thirty-second session
Geneva, 3-12 (a.m.) December 2007
Item 6 of the provisional agenda

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

Optional use of fusible elements on portable tanks with a test pressure
higher than 2.65 bar for organometallic Substances

Submitted by the International Council of the Chemical Associations (ICCA) ^{*/}

Introduction

1. For more than 40 years, organometallic substances, spontaneously combustible (pyrophoric) and solutions of these in hydrocarbon solvents have been shipped world-wide in many thousands of tanks that are equipped with fusible elements that are capable for pressures of at least 10 bar (g). The experience is a very high reliability and a good function in case of accidental product release while loading and unloading. During transportation, no case is known among the three great shippers of these materials where the fusible elements were activated, failed or broke.

^{*/} In accordance with the programme of work of the Sub-Committee for 2007-2008 approved by the Committee at its third session (refer to ST/SG/AC.10/C.3/60, para. 100 and ST/SG/AC.10/34, para. 14) (packing).

2. Regarding the properties of organometallic substances that are shipped in rigid portable tanks and tank containers with minimum test pressures of more than 2.65 bar (g), it is a requirement that in case of a product release and a potential fire the tanks are equipped with a depressurizing system that releases the inside pressure in order to avoid rupturing of the tank.

3. For these substances, a fusible element is in numerous cases used as the secondary pressure relief device, in addition to a re-closing pressure relief device both located atop portable tanks.

4. If mounted, some affix the fusible element adjacent to the loading/unloading valves (within a housing unit which protects the valves from rain, snow, and dirt), set to operate in the event of spillage. Others locate the fusible element elsewhere at the top of the portable tank, set to operate in the event of a fire engulfment.

5. In 6.7.2.10.1, the use of fusible elements on portable tanks with test pressures higher than 2.65 bar is prohibited for tanks. However, fusible elements are not prohibited on portable tanks in the current ADR/RID, built according to ADR/RID Chapter 6.8. Further, fusible elements have also been allowed on portable tanks until the 29th Amendment of the IMDG Code without restriction of the design pressure. ICCA is of the opinion that the option of using a fusible element, in addition to a pressure relief valve, should be allowed. We believe this optional safety device be retained in order to continue our industry efforts to protect our customers. This should be distinguished, however, from a request to mandate the use of fusible elements, as many portable tanks currently in use are not equipped with fusible elements but are instead equipped with other protective devices currently allowed by 6.7.2.10.1.

6. A second issue raised in this proposal is the melting temperature or, in terms of the Model Regulations, operation temperature as prescribed in 6.7.2.10.1.

Justification/Technical considerations

Fusible element

7. For the handling at the customers' sites, it is an advantage and an additional – voluntary – safety feature to have a device on the tank that – in the worst case – stops the release of (in a number of cases pyrophoric) material independently from the varying customers' installations.

8. The products concerned are loaded and unloaded using an inert gas and the material is transported under an inert gas pad. As a safety precaution a number of manufacturers of these materials have mounted fusible elements at the top of the tank near the loading and unloading valves on these portable tanks (for portable tanks larger than 1900 litre capacity: in parallel with a re-closing pressure relief valves) as an additional safety precaution to protect personnel and the environment during loading and unloading operations.

9. In the event of failure of the valves or transfer hose/piping at the top of the portable tank during loading or unloading operations, any spilled pyrophoric materials in the valve area will activate the fusible element, enabling it to relieve the internal pressure of the portable tank and cease the flow of liquid from the inside of the tank.

10. As mentioned before, many thousands of tanks equipped with fusible elements are in service for decades without problems; these elements were allowed in the past according to the IMDG code and still according to ADR/RID.

11. ICCA proposes to address this issue in the form of a TP note that is applicable to materials of UN Nos. 3391 to 3400.

Operating temperature of fusible elements

12. The operation temperature as prescribed in 6.7.2.10.1 for fusible elements should be between 110 °C and 149 °C. No technical justification could be found why this temperature should be between 110 °C and 149 °C. For those organometallic substances that might decompose at higher temperatures, it is even recommendable to start the pressure relief at a lower melting temperature, well before the decomposition gases develop an additional pressure increase. A figure of 100 °C seems to be sufficient for such a substance. It is proposed to have a maximum melting temperature of 200 °C which gives more flexibility, although this upper melting point value is somewhat arbitrary.

Proposals

13. Amend the second sentence of 6.7.2.10.1 to read:

“They shall be placed at the top of the shell with their inlets in the vapour space, and ~~in no case shall they be shielded from external heat~~ when intended as the primary relief device, they shall not be shielded from external heat.”

14. Amend the third sentence of 6.7.2.10.1 to read:

“Fusible elements shall not be utilized on portable tanks with a test pressure which exceeds 2.65 bar unless specified by special tank provision TPxx in Chapter 3.2, dangerous goods list”.

15. Add the following new tank provision into column 11 of the dangerous goods list of Chapter 3.2 for the following UN Nos.:

Column (1)	Column (11)
UN 3391	TPxx
UN 3392	TPxx
UN 3393	TPxx
UN 3394	TPxx
UN 3395	TPxx
UN 3396	TPxx
UN 3397	TPxx
UN 3398	TPxx
UN 3399	TPxx
UN 3400	TPxx

TPxx needs to be added to the entry for each PG i.e. I, II and III for UN 3395 to UN 3399 and II, III for UN 3400.

16. Add the following TP provision to the list of the portable tank special provisions in 4.2.5.3:

“TPxx Fusible elements in the vapour space designed and approved to the satisfaction of the competent authority or its authorized body may be utilized on portable tanks.”.

17. Amend the first sentence of 6.7.2.10.1 to read:

“Fusible elements shall operate at a temperature between ~~110~~ 100 °C and ~~149~~ 200 °C on condition that the pressure in the shell at the fusing temperature will be no more than the test pressure”.
