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**ECONOMIC COMMISSION FOR EUROPE**

**INLAND TRANSPORT COMMITTEE**

**Working Party on the Transport  
of Dangerous Goods**

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**CARRIAGE OF LIQUEFIED GASES IN TANKS  
WITH RECESSED VALVE CHEST MOUNTED IN DISHED END**

**Transmitted by the Government of the United Kingdom**

**Background**

Marginal 211 232 (5) of ADR (by the code “D” in the 3<sup>d</sup> part of the tank code for gases in 4.3.3.1.1 of the restructured text) specifies that tanks used for carriage of UN 1017 chlorine and UN 1079 sulphur dioxide must have all connections above the liquid level. This proposal requests that the relevant text be modified to allow the carriage of these products in tanks with end connections, which are always below the liquid level and are mounted inside a valve chest.

Each of the products has been carried in considerable quantities in road tankers which have an enclosed valve chest located inside the dished end of the tank. The filling and discharge connections are located inside the valve chest and are protected during transit by steel doors. The valves are mounted so that they do not project outside the contour of the shell and they are therefore highly protected from impact.

These tankers have been used in the UK for over thirty-five years without any incidents occurring. Tankers of similar design have also been used in South Africa and Australia over a long period of time, with a sound safety record. All chlorine and sulphur dioxide tank transport in the UK is by road. The ADR Framework Directive allows the continued use of tankers that comply with domestic regulations in a member state. Nevertheless, changes to domestic legislation to embrace international regulations would prohibit manufacture of new tanks to this proven design. The current design has a proven safety record and it is believed that the continued use of this design is safe and appropriate.

The normal alternative to ‘top filling’ is ‘bottom’ filling, where there is an outlet from the bottom of the tanker usually with a pipe which runs to a convenient discharge point at the back of the tanker. This is most inappropriate for chlorine and sulphur dioxide and is not being proposed.

Eurochlor publication *Protection of road tankers for the carriage of chlorine* (1) recommends two alternatives for the protection of chlorine filling/discharge valves from damage during road incidents, one of which is as follows;

‘Valve protection is provided by a valve chest whereby the valves are recessed inside the tanker barrel. This is ideally located at the front, behind the cab unit. The valve chest should be covered by a suitable substantial access door, which can be secured closed during transport’

### **Proposal**

Add a new Special Provision TEXX to 6.8.4(b) and in column 13 of Table A in 3.2 against the entries for 1017 Chlorine and 1079 Sulphur dioxide with the following text:-

“**TEXX** Shells of fixed tanks (tank vehicles) may have filling or discharge openings below the surface level of the liquid, provided the valves are recessed inside the contours of the shell protected by a valve chest. This valve chest shall be protected by doors affording protection against external damage at least equivalent to that afforded by the shell. The doors shall be capable of being securely closed during carriage.”

### **Justification**

The advantages would be as follows;

1. Road tank-vehicles involved in serious accidents usually do not remain upright. This results in any top mounted valves being below the liquid surface and highly exposed to impact. The tanker may roll upside down, in which case the top mounted valves and dome could be subjected to the full weight, impact and sliding loads. An end mounted valve chest system is never exposed in this way.
2. Following a serious accident in which the vehicle rolls over, it is desirable to empty the contents safely before it is moved. There is a significant probability that top mounted valves would be inaccessible whereas those in the proposed valve chest are more likely to be accessible.
3. A valve mounted inside a valve chest that is welded inside the dished end has far more protection from impact than a valve mounted on top of the tank, outside the tank shell surface and in an external dome. The position - recessed within the bounds of the shell - and external protection provide protection against rear impact.
4. Access is at a lower level and allows a safer working environment for connection and testing of hoses.
5. Neither of the above products is difficult to seal. Extensive experience of performance in both transport and static applications show that proper sealing is easily achievable. There is no case for prohibition of joints below the liquid level on these grounds.
6. This proposal is highly specific about the design that can be used and continues to class bottom outlets as Not Allowed, thereby maintaining the safety achieved by not allowing bottom outlet designs.
7. There is an exemplary safety record in the UK and in other countries, using the proposed valve chest arrangement. The design of the shell to accommodate the valve recess is taken account of within national and international pressure vessel design codes.

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### **Reference**

1. Eurochlor, *Protection of road tankers for the carriage of chlorine*, GEST 96/221, 1<sup>st</sup> edition, May 1998.

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