



Economic and Social Council

Distr.: General
29 June 2010
English
Original: French

Economic Commission for Europe

Inland Transport Committee

Working Party on the Transport of Dangerous Goods

Joint Meeting of the RID Committee of Experts and the Working Party on the Transport of Dangerous Goods

Geneva, 13–17 September 2010

Item 2 of the provisional agenda

Tanks

Additive systems on tanks for UN No. 1202 heating oil, light

Proposal transmitted by the European Conference of Fuel Distributors (ECFD)^{1, 2}

Summary

Executive summary: To ensure the safe operation of petroleum tanks for UN No. 1202 heating oil, light (special provisions 640K, 640L and 640M), equipped with additive systems, the minimum technical safety requirements for the service equipment of the devices for emptying the tanks should be observed.

Decision to be taken: Additive systems to be covered by the term “service equipment” and the term “additive system” to be defined in 1.2.1; a TE special provision on minimum technical safety requirements for additive systems to be included in 6.8.4 (b) and assigned to UN No. 1202 heating oil, light, in column 13 of Table A under 3.2.1.

Related documents: OTIF/RID/RC/2010/14 – ECE/TRANS/WP.15/AC.1/2010/14
OTIF/RID/RC/2010-A/Add.1, – ECE/TRANS/WP.15/AC.1/118/Add.1, paragraph 22

¹ In accordance with the programme of work of the Inland Transport Committee for 2006–2010 (ECE/TRANS/166/Add.1, programme activity 02.7 (c)).

² Circulated by the Intergovernmental Organisation for International Carriage by Rail (OTIF) under the symbol OTIF/RID/RC/2010/14.

Introduction

1. The Working Group on Tanks of the Joint Meeting (Bern, 22–26 March 2010) discussed in detail the proposals made in document OTIF/RID/RC/2010/14 – ECE/TRANS/WP.15/AC.1/2010/14 with a view to including provisions on additive systems in the regulations and considered their feasibility. On that occasion, it was unanimously acknowledged that the provisions were necessary because those systems, which were mounted on petroleum tanks, were already widely used. Before the subject was considered further, the issues raised should nevertheless be clarified in a reworded proposal. For this reason, these issues are dealt with in detail below.

I. Additives

2. Additives for heating oil, light, are materials and mixtures that reduce soot formation and, accordingly, enhance burner efficiency. They also reduce the formation of deposits in storage tanks as well as pollutant emissions, and reduce the frequency of burner maintenance. Additive manufacturers use the following dangerous goods classifications:

UN 1202 HEATING OIL, LIGHT, 3, III

UN 1993 FLAMMABLE LIQUID, N.O.S., 3, III

UN 3082 ENVIRONMENTALLY HAZARDOUS SUBSTANCE, LIQUID, N.O.S., 9, III

Some additives are *not* classified as dangerous goods and are therefore distributed in the same way as non-dangerous goods. In any event, there are no other classifications for additives.

II. Storage receptacles for additives (construction of the receptacles)

3. Packing instruction P001 is applicable when the additives referred to are packed as dangerous goods. The instruction stipulates that drums and jerricans made of steel, aluminium or plastics may be used. Drums may also be made of metals other than steel or aluminium. There is an additional requirement that packagings must be vented when the substances give off small quantities of nitrogen or carbon dioxide. Suitable mass-produced packagings further need to correspond to an approved design type and meet the conditions referred to in the approval.

4. When additive storage receptacles are used in additive systems for petroleum tanks for UN No. 1202 heating oil, light (special provisions 640K, 640L and 640M), restrictions are required. Specifically, the following requirements should apply to those types of receptacle.

5. Additive storage receptacles should be made of a metallic material. If the design type of the original receptacle (if it is a conversion, the construction type approval is no longer valid) has not been approved, pursuant to Chapter 6.1, then it must comply with the following minimum wall thickness requirements:

<i>Material</i>	<i>Minimum wall thickness</i>
Austenitic stainless steels	2.5 mm
Other steels	3 mm
Aluminium alloys	4 mm
99.80% pure aluminium	6 mm

6. Welds should be skilfully made and afford complete safety. Welding should be performed by skilled welders using a welding process whose effectiveness (including any heat treatments required) has been demonstrated by test.

7. The additive storage receptacle should be provided with a vent device with a flame arrester and a device for preventing spillage of the contents in the event of the receptacle tipping over. It should also be provided with an overflow protection device, otherwise it should be impossible for any overflowing additive to drip onto parts that become hot during use (brakes, for example). Unless a higher pressure is required by the system, the test pressure of the additive storage receptacle should be of at least 0.3 bar.

8. If the packagings are not UN ones, the plate of each additive storage receptacle must display the following particulars:

- Material
- Manufacturer's name or mark
- Year of manufacture
- Capacity
- Test pressure
- Working pressure

III. Volume of additive storage receptacles

9. As discussed by the Working Group on Tanks of the Joint Meeting (Bern, 22–26 March 2010), the volume of additive storage receptacles should be restricted to an individual capacity of 100 litres (see OTIF/RID/RC/2010-A/Add.1, – ECE/TRANS/WP.15/AC.1/118/Add.1, paragraph 22). Consequently, metallic UN packagings or receptacles with an individual capacity of up to 100 litres, manufactured in accordance with paragraphs 3 to 7, may be used in additive systems.

10. At most four additive storage receptacles are permitted for each petroleum tank; the receptacles must be provided with individual stop-valves. The use of replacement receptacles is permitted as long as they meet the above-mentioned requirements.

IV. Arrangement and protection of additive storage receptacles

11. The position of the additive storage receptacles relative to the petroleum tanks should be selected not only on the basis of operational imperatives (for example, minimizing the length of pipes) but also, primarily, in the light of safety requirements. To avoid impeding structural improvements, a fixed position should not be specified; it is sufficient to give recommendations on the arrangement of the receptacles. In safety terms, the aim should be to protect the additive storage receptacle from possible external aggression (e.g. crushing, impacts, overturning) and therefore to remove it from the primary danger zone. This means that the additive storage receptacle must be arranged in such a

way that, in the event of a minor incident, the receptacle does not start leaking immediately and thereby increase the threat to the tank.

12. For this purpose, additive storage receptacles can be placed in piping housings, in a separate housing or around the edge of the tank (for example, depending on their size and number, they can be placed underneath the tank). Larger additive storage receptacles can also be built into the tanks as long as the relevant construction requirements for the tank compartments are met. It is also possible to attach them to the tank (on the outside, for example, on the bed in front of the tank) once measures have been taken to protect the receptacle through damping.

V. Integration of the dosing system (additive system) in the emptying device

13. The additive system materials that come into contact with the contents (additive or heating oil, light) should not contain substances that react hazardously with them, generate dangerous substances or significantly fatigue the materials. The additive system and its couplings should be built into the emptying device of the petroleum tank so that they are protected against the risk of being wrenched off or damaged during carriage or handling and can withstand static and dynamic stress under normal carriage conditions without loss of contents (other than quantities of gas escaping through any existing degassing vents). The flow between the additive system and the outlet of the petroleum tank should be controlled by suitable technical means (non-return valves, for example) so that there is no accidental flow or resultant pressure increase between the petroleum tank and the additive storage receptacle(s).

VI. Evaluation of the entire “additive system” in the light of the regulations

14. The additive systems are spatially and functionally integrated in the device for emptying the petroleum tanks. They are therefore among the items of equipment of tanks as per 6.8.2.2. These items are in turn divided into “service equipment” and “structural equipment” of tanks. Additive systems are “service equipment of tanks”. They function in such a way that, when heating oil is dispensed from the petroleum tank, a predetermined dose of additive is optionally added to the heating oil (depending on whether the customer wants additive-free heating oil). Additive systems must therefore be included in the category “service equipment” under Chapter 1.2 and defined as a separate concept.

VII. Incorporation in the regulations

15. The integration of additive systems in the emptying device of petroleum tanks requires the regulations governing such systems to be incorporated in the requirements applicable to the construction of tanks in Chapter 3.8. Since the additive systems are neither spatially nor functionally separate from the petroleum tanks, they cannot be exempted. Furthermore, additive systems are functionally independent of the vehicles carrying petroleum tanks. Therefore, there is no need to subject additive systems to the technical requirements applicable to vehicles (for example, ADR Part 9).

VIII. Proposal

16. **1.2.1** Paragraph (a) of the definition of “**service equipment**” should be amended to read as follows:

“(a) Of the *tank* means filling and emptying devices, **including additive systems**, venting, safety, heating and heat insulating devices and measuring instruments;”.

The NOTE remains unchanged.

17. **1.2.1** Insert a new definition to read as follows:

““**Additive systems**’ mean additional fixed elements of the service equipment of a tank, integrated in the emptying devices, which, during the filling of storage tanks, mix so-called additives with the product to be delivered. Additive systems generally consist of one or more additive storage receptacles with a maximum individual capacity of 100 litres and the necessary dispensing and dosing devices.”

18. **3.2.1**

Table A

UN 1202 Add to column (13):

“TE xy”.

19. **6.8.4 (b)** Insert a new special provision to read as follows:

“**TE xy** If the service equipment of a tank includes an additive system, the minimum technical safety requirements (materials, minimum wall thickness, test pressure) shall be observed for the construction of the storage receptacle.

Additive storage receptacles shall be made of a metallic material. If the design type of the original receptacle (if it is a conversion, the construction type approval is no longer valid) has not been approved, pursuant to Chapter 6.1, then it shall comply with the following minimum wall thickness requirements:

<i>Material</i>	<i>Minimum wall thickness</i>
Austenitic stainless steels	2.5 mm
Other steels	3 mm
Aluminium alloys	4 mm
99.80% pure aluminium	6 mm

Welds shall be skilfully made and afford complete safety. Welding shall be performed by skilled welders using a welding process whose effectiveness (including any heat treatments required) has been demonstrated by test.

The additive storage receptacle shall be provided with a vent device with a flame arrester and a device for preventing spillage of the contents in the event of the receptacle tipping over. It shall also be provided with an overfill protection device, otherwise it should be impossible for any overflowing additive to drip onto parts that become hot during use (e.g. brakes). Unless a higher pressure is required by the system, the test pressure of the additive storage receptacle shall be of at least 0.3 bar.

If the packagings are not UN ones, the plate of each additive storage receptacle shall display the following particulars:

- Material

- Manufacturer's name or mark
- Year of manufacture
- Capacity
- Test pressure
- Working pressure

The requirements of 6.8.2.2.1 and 6.8.2.4 shall also be taken into consideration for the entire additive system.

The actual additive storage receptacles may be positioned inside the tank in accordance with the provisions of 6.8.2 and 6.8.5 concerning the construction of tanks, or outside the tank. If the additive storage receptacles are positioned outside the tank, a distinction shall be made as to whether they are attached permanently to the dispensing and dosing devices of the additive system, or whether they are replacement receptacles connected thereto. Replacement receptacles that must be connected to the dispensing and dosing system shall be metallic packagings within the meaning of Chapter 6.1.”
