

## 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  
Bern, 18–22 March 2013

21 March 2013

### Report of the Working Group on Tanks of the Joint Meeting of the RID Committee of Experts and the Working Party on the Transport of Dangerous Goods at its spring 2013 session<sup>1</sup>

1. The Working Group on Tanks met from 18 to 20 March 2013 in Bern on the basis of an appropriate mandate from the RID/ADR/ADN Joint Meeting, under the chairmanship of Mr. Arne Bale (United Kingdom) and with secretariat by Mr. Michaël Bogaert (Belgium). The relevant documents were submitted to the plenary session and remitted to the Working Group for consideration.

2. The Working Group on Tanks, consisting of 26 experts from 13 countries and 4 NGO's, dealt with the following official and informal documents in order:

*Documents:* ECE/TRANS/WP.15/AC.1/126/Add.1 (Report of the Working Group on Tanks at its last session)  
ECE/TRANS/WP.15/AC.1/2012/23 (Romania) + INF.3 (September 2012) (Romania) + INF.41 (Romania)  
ECE/TRANS/WP.15/AC.1/2013/3 (Secretariat)  
ECE/TRANS/WP.15/AC.1/2013/6 (AEGPL) + INF.40 (AEGPL)  
ECE/TRANS/WP.15/AC.1/2013/8 (CEN)  
ECE/TRANS/WP.15/AC.1/2013/11 (ECFD)  
ECE/TRANS/WP.15/AC.1/2013/12 (Germany)  
ECE/TRANS/WP.15/AC.1/2013/19 (United Kingdom)  
ECE/TRANS/WP.15/AC.1/2013/21 (Belgium)  
ECE/TRANS/WP.15/AC.1/2013/23 (Sweden)

*Informal documents:* INF.4 (EIGA)  
INF.21 (Norway)  
INF.30 (UIP)

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<sup>1</sup> Circulated by the Intergovernmental Organization for International Carriage by Rail (OTIF) under the symbol OTIF/RID/RC/2012-A. Unless otherwise indicated, the other documents referred to in this report under the symbol ECE/TRANS/WP.15/AC.1/ followed by the year and a serial number were circulated by OTIF under the symbol OTIF/RID/RC/ followed by the year and the same serial number.

**Item 1: ECE/TRANS/WP.15/AC.1/2012/23 (Romania) + INF.3 (September 2012) (Romania) + INF.41 (Romania) – Definitions for “Closure”, “Tank” and “Shell”**

3. The Working Group looked at the definitions for “shell” and “closure” consecutively, as these definitions are interlinked and refer to other defined terms such as receptacles and tanks. The current definition of “shell”, which is defined as “sheathing containing the substance (including the openings and their closures)” was deemed in need of improvement and alignment with the definition for shell as stated for UN portable tanks. The following definition for shell is proposed as replacement of the current definition in 1.2.1.

**Proposal**

Substitute the current definition of “shell” in 1.2.1 with the following:

“Shell” means the part of the tank which retains the substance intended for carriage, including openings and their closures, but does not include service equipment or external structural equipment;

4. The notes 1 and 2 were still deemed necessary as the definition for shell changes slightly between 6.7.2.1, 6.7.3.1 and 6.7.4.1. Consequentially, the proposal to delete the definition for “shell” throughout chapter 6.7 was not supported. In the same context of multimodal harmonization, changes to the definition of “closure” were not supported as this definition comes from the UN Model Regulations and should be raised there.

5. Additionally, in the English language version the word “shell” is also used in the context of classification of class 1 substances in 2.2.1.1.7.5. This problem does not arise in the other language versions of the regulations.

**Proposal**

In the English language version, add a NOTE 3 to the definition of “shell”:

“NOTE 3 : This definition does not apply to classification in accordance with section 2.2.1”

6. Finally, the proposal in INF.41 paragraph 12 to include the word “un” in the French language version of the regulations for the definition of “fermeture” was supported by the Working Group.

**Proposal**

Insert the word “un” in the definition of “fermeture” in 1.2.1 in the French language version of the regulations:

*“Fermeture”, un dispositif servant à fermer l'ouverture d'un récipient ;*

## **Item 2: ECE/TRANS/WP.15/AC.1/2013/3 (Secretariat) – Harmonization of Chapter 6.7 with the United Nations Model Regulations on the Transport of Dangerous Goods**

7. The Working Group supported the proposal by the Secretariat and considered the omission of the proposed text in the ADR/RID/ADN as an oversight. When the UN text came into the regulations, the harmonization proposals made by the secretariat did not include chapter 6.7 and as the EIGA proposals for this chapter were mainly related to MEGC's, this likely led to the omission of this text. The Working Group decided to adopt the proposed text in 2013/3 with the following two amendments substituting “transported” by “carried”, which is a defined term in ADR/RID/ADN:

### **Proposal**

Substitute the word “transported” by the word “carried” in the proposed 6.7.2.2.17 and 6.7.2.5.13

### **Proposal**

Substitute the word “transport” by the word “carriage” in the proposed 6.7.2.19.4 (two times)

## **Item 3: ECE/TRANS/WP.15/AC.1/2013/6 (AEGPL) + INF.40 (AEGPL) – Periodic inspection of LPG road and rail tankers – Alternatives to the hydraulic test**

8. The proposal by AEGPL was discussed in detail by the Working Group. Several experts were of the opinion that non-destructive testing (NDT) methods were indeed valuable to find certain defects not normally detected by a hydraulic pressure test but some saw these methods as complementary to the existing test scheme and not as a replacement. It was noted that standard EN 14334, which is an LPG standard on inspection and testing containing details on NDT methods, has been proposed for adoption in the regulations in the past but was deemed not to be in conformity with the regulations at the time. Several experts highlighted that certain NDT methods are only applicable for carbon steel LPG tanks or might be more suitable to new construction instead of periodic inspection. Depending on the type of defect that is looked at, different types of methods are appropriate. The Working Group did not endorse the idea of leaving various options open for competent authorities as LPG tankers are also subject to TPED and a uniform set of technical requirements/procedures should be pursued. There was a consensus that the current proposal lacked a number of more detailed specifications:

- The standard EN 14334 which is referred to should be made available for consideration by the Working Group
- The scope of the NDT methods should be more closely defined (is 100% testing of welds required, applicable for which material thicknesses, what base materials, valid for which types of tanks,...)
- What level of competence is required for these methods (see TT8)?
- What would a detailed test scheme look like?
- Which NDT methods should be used for which inspections (ultrasonic also for plates,...)?

9. The Working Group considered that more work on the issue is needed and invited AEGPL to take the feedback from the discussion into account and to come back with a more detailed proposal at the next session.

**Item 4: ECE/TRANS/WP.15/AC.1/2013/8 (CEN) – Miscellaneous proposals for amendment of RID/ADR related to pressure receptacles, tanks and their equipment**

10. The Working Group discussed the issue raised in item 1 of the CEN document. During discussion, the group questioned the value of 100 g and how this value was derived since the maximum measured g-value under accident conditions is difficult to determine and depends on the expected applied stress (continuous or shock-response) or even the frequency of measurement. The preference was expressed for protection of equipment rather than defining large acceleration values as design requirement as it was also unclear how the 100 g requirement was related to the re-closing of a safety valve as mentioned in the CEN document. For low pressure tanks for petroleum products most equipment standards already make reference to a capability requirement or a test to withstand dynamic stresses normally encountered during carriage. For LPG tanks, the standard EN 14129 already incorporates the 100 g requirement for safety valves (applicable for road tanks). For other pressure tanks it was highlighted that not all relevant equipment standards have been developed yet by CEN TC 296 WG 3. Ultimately, the Working Group did not propose an additional general capability requirement against dynamic loads for equipment in chapter 6.8.

**Item 5: ECE/TRANS/WP.15/AC.1/2013/11 (ECFD) – Additive devices**

11. Discussion of the ECFD document was postponed to the next session of the Working Group, following its withdrawal.

**Item 6: ECE/TRANS/WP.15/AC.1/2013/12 (Germany) –Chapter 6.10 Vacuum-operated waste tanks – Explosion-pressure proof design of vacuum-operated tanks as an alternative to flame traps**

12. Following from the discussion in the March 2012 session, the Working Group clarified the difference between the technical code TRT 006, which allows plastic deformation of the tank, and EN 14460 which contains calculation methods for both explosion pressure proof (allowing only elastic deformation) and explosion pressure shock resistant tanks (allowing also plastic deformation). The group decided that the intent of 6.8.2.2.3, and thereby 6.10.3.8 b), was that the tank should survive an explosion incident without leakage of content, and hence that explosion pressure shock resistance was what was envisaged as a capability requirement. For this reason, the group amended the German proposal and 6.8.2.2.3 to be in line with the terminology defined in the EN standard.

## **Proposal**

Amend the second paragraph of 6.8.2.2.3 to read as follows:

*Vacuum valves (RID only: and self operating ventilation valves) and breather devices (see 6.8.2.2.6) used on tanks intended for the carriage of substances meeting the flash-point criteria of Class 3, shall prevent the immediate passage of flame into the shell by means of a suitable protective device, or the shell of the tank shall be explosion pressure shock*

resistant, which means being capable of withstanding without leakage but allowing deformation, an explosion resulting from the passage of the flame.

## Consequential proposal

Replace the words “non-explosion-pressure proof tank” with the words “non-explosion pressure shock resistant tank” for the V- tank code in 4.3.4.1.1 and replace the words “explosion-pressure proof tank” with the words “explosion pressure shock resistant tank” for the F- tank code in 4.3.4.1.1.

13. The group agreed that 6.10.3.8 b) did not exclude the applicability of the general requirements under 6.8.2.2.3 and proposed for clarity reasons to align the text with the following additional text. The requirement for the shell was extended in this paragraph to the whole tank so as to include piping.

## Proposal

Amend 6.10.3.8 b) to read as follows:

*A device to prevent immediate passage of flame shall be fitted to both the inlet and outlet of a vacuum pump/exhauster unit which may provide a source of ignition and which is fitted on a tank used for the carriage of flammable wastes, or the tank shall be explosion pressure shock resistant, which means being capable of withstanding without leakage but allowing deformation, an explosion resulting from the passage of the flame ;*

14. Additionally, the group decided to ask CEN/TC296 to assess the standard EN 14460 and TRT006 (which is applied in practice) for possible future reference in the regulations and to put this issue also forward as a work item for the next revision of EN 14025 by TC 296.

15. Finally, as a result of the discussion, a separate issue was raised for vacuum operated waste tanks which could benefit from a flame arrester not only to protect the tank itself but more specifically to prevent the propagation of a flame via the loading line to the stationary vessel from which product is drawn via the pump. As this was outside the scope of the current discussions, interested parties were invited to come back to this issue at a later stage.

## **Item 7: ECE/TRANS/WP.15/AC.1/2013/19 (United Kingdom) –Use of the term maximum working pressure for RID/ADR tanks for refrigerated liquefied gases**

16. The Working Group first addressed the question raised in plenary by Austria concerning the pressure build-up in the tank up to a maximum of 10% above the maximum working pressure in 6.8.3.2.11. This safety tolerance provision was already in place in the regulation and there is no modification proposed in the UK document.

The UK document proposed a consistent use of the term Maximum Working Pressure (MWP) for RID/ADR tanks for refrigerated liquefied gases, as the term Maximum Allowable Working Pressure (MAWP) is used for portable tanks. However EIGA pointed out that the term MAWP is commonly used by industry for all tanks and therefore requested deferring a decision until the full implications of this change can be assessed.

EIGA was invited to submit a paper for the next meeting giving examples of the different use of MAWP and MWP i.e. on the tank plate.

17. In the French version of the text the problem is less dominant as “MAWP” is there described as “pression de service maximale autorisée” for refrigerated liquefied gases in 4.3.3.2.4 and 6.8.3.2.11.

**Item 8: ECE/TRANS/WP.15/AC.1/2013/21 (Belgium) –Report of an incident involving a propane tank**

18. The Working Group discussed the incident report put forward by Belgium from a tank construction point of view. The group agreed that no unprotected protrusions were allowed on these tanks and referred to the principles set out in 6.8.2.1.28 and paragraphs 4.1 and 8.11.3 of LPG standard EN 12252. Most experts were of the opinion that these bolted threaded openings also belonged to the service equipment (for venting) and that also under 6.8.2.2.1 they should be adequately protected or placed in recessed housing. For this reason, no additional text for clarification was deemed necessary.

19. It was confirmed that for more recent tanks this problem no longer exists as the relevant referenced standards (e.g. EN 13094 or EN 12252) are clear that protrusions shall be flush with the top of the tank or shall be protected. It was pointed out that a socket plug, not protruding from the top of the tank would have fulfilled these requirements. Hence, the Working Group proposed that national competent authorities communicate to their inspection bodies and industry stakeholders to refit these threaded openings with socket plugs which do not protrude from the shell instead of bolts on existing tanks, where applicable.

**Item 9: ECE/TRANS/WP.15/AC.1/2013/23 (Sweden) –Marking of test date**

20. In relation to the marking of ADR/RID tank containers and UN portable tanks with the date of the next inspection, many members of the working group expressed a preference for proposal 1 and some for proposal 2. However there was a consensus that a consistent approach should be pursued for both UN portable tanks and ADR/RID tank containers.

21. Therefore the Working Group was of the opinion that the best approach would be to raise this issue first at the UN level since the impact for only ADR/RID tank containers would be limited given the far greater number of UN portable tanks. Nonetheless, the Working Group wished to express its support for the principal of the Swedish proposal when it is transferred to the UNSCETDG and proposed to revisit the issue after discussion at that level.

**Item 10: INF.4 (EIGA) –Holding times for the carriage of refrigerated liquefied gases**

22. The Working Group referred to the discussion during the March 2012 session of documents 2012/1 (UIC) and INF.32 (EIGA). The causes for premature activation of safety valves in the carriage of refrigerated liquefied gasses was subdivided into operational issues and construction and inspection issues.

From the operational side the emphasis should be on correct loading procedures and adequate cool-down of the tank in order to respect the defined pressure levels and the holding time. Pressure reduction should be considered for tank which remain in transit for longer periods of time. From a constructional point of view, adequate calculation methods should be referenced for manufacturers and substance-holding time tables (depending on tank characteristics, filling ratio, pressure level, etc.) should be made available for downstream users (e.g. fillers).

23. For this reason a two-tier approach was proposed by the Working Group:

- A general requirement for operational measures to avoid premature activation of the pressure relief device should be included in the regulations, which could make reference to guidance documentation developed by the industry.
- An evaluation of the calculation methods should be made and an adequate method should be mentioned in the regulations as a means of fulfilling the requirements for the determination of the actual holding time.

For this second work item, the Working Group decided to ask EIGA to make the guidance document 041/10 publicly available and ask CEN to make EN 12213 available for the members of the Working Group on Standards for possible reference in the regulations.

24. EIGA proposed to carry this work forward and confirmed that guidance documentation is freely available on the EIGA website. The Working Group strongly supports this initiative by EIGA and will revisit this issue at a later stage, pending the results from their work.

### **Item 11: INF.21 (Norway) – Carriage of refrigerated liquefied gases in portable tanks**

25. The Working Group treated the various questions posed in INF.21:

- Is distribution of refrigerated liquefied gases allowed in UN portable tanks?  
Yes, in accordance with the definition of portable tanks, distribution is not forbidden by the regulations. The phrase “without breakage of load” in the definition for containers refers to a capability requirement of a container to be able to be transferred between different modes of transport without necessary unloading and reloading and does not prohibit distribution.
- Are surge plates allowed in UN portable tanks for refrigerated liquefied gases and if so, is a new approval needed when outfitting existing tanks?  
Yes, in accordance with the general requirements in 6.7.4.2.11 surge plates are allowed and are used to reduce dynamic load on the tank head and against liquid movement when braking. As surge plates generally influence the design of the tank, a new approval is needed.
- Are the requirements in ADR 9.7.5 with regards to vehicle stability applicable?  
No, 9.7.5 is only applicable for tank-vehicles and ECE R 111 is in any case only applicable for tanks up to 4 bar. Given the dedicated use of the vehicles fitted with pumps described by Norway however, the competent authority could take possible stability issues into account, e.g. with a vehicle tilt test.

**Item 12: INF.30 (UIP) – Alignment of approval and inspection procedures for tanks for substances of Class 2 and tanks for substances of classes 3-6, 8 and 9**

26. The Working Group clarified that imposing the requirements of 1.8.6 and 1.8.7 also for other classes simply made the same requirements applicable as for class 2 (quality management system, accreditation,...) but it is through EU legislation such as the TPED that a common market system is created. In RID 6.8.2.4.6, the principle of allowing periodic inspection in other countries is already incorporated. In addition, several countries already require accreditation for inspection bodies for other classes than class 2 through national legislation.

27. From a technical perspective, there were concerns about the availability of harmonized standards for all of the other classes besides class 2.

28. Ultimately, the Working Group did not take a final position on the proposal by UIC as it was a late INF paper. No objections were made in principle and UIP was invited to come back with a more developed official document for the next session. Aside from the technical aspects however, this was considered to be a general issue to be considered by the plenary.

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