

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, 15–25 September 2015

Item 6 of the provisional agenda

Tanks

23 September 2015

Report of the Working Group on Tanks

1. The Working Group on Tanks met from 21 to 23 September 2015 in Geneva on the basis of the mandate from the RID/ADR/ADN Joint Meeting, under the chairmanship of Mr. Arne Bale (United Kingdom) Mr. Kees de Putter (the Netherlands) as secretary. The relevant documents were submitted to the plenary session and transferred to the Working Group for consideration.

2. The Working Group on Tanks, consisting of 24 experts from 12 countries and 5 non-governmental organizations, dealt with the following official and informal documents :

Documents:

- ECE/TRANS/WP.15/AC.1/2015/15 (UK)
- ECE/TRANS/WP.15/AC.1/2015/23/Add1 (Secretariat)
- ECE/TRANS/WP.15/AC.1/2015/27 (UIC)
- ECE/TRANS/WP.15/AC.1/2015/30 (OTIF)
- ECE/TRANS/WP.15/AC.1/2015/31 (Latvia)
- ECE/TRANS/WP.15/AC.1/2015/39 (Norway)
- ECE/TRANS/WP.15/AC.1/2015/51 (Netherlands)
- ECE/TRANS/WP.15/AC.1/2015/54 (Netherlands)

Informal documents:

- INF.4 (CEN)
- INF. 10 (UK)
- INF. 17 (D)
- INF. 22 (CH)
- INF. 23 (F)
- INF. 24 (CEN)
- INF. 28 (B)
- INF. 29 (UK)

Item 1: ECE/TRANS/WP.15/AC.1/2015/15 (UK) – Tanks and standards – EN12972:2014 – Tanks or transport of dangerous goods – Testing, inspection and marking of metallic tanks + INF 36 (march 2015 session).

3. It was recalled that for the next session of the Joint Meeting a CEN consultant would be in attendance and that this document should be considered in the spring 2016 Joint Meeting by the Standards Working Group. It was noted that the remarks in these documents were under discussion by the appropriate CEN working group.

Item 2: ECE/TRANS/WP.15/AC.1/2015/23/Add1. (Secretariat) – Report of the Ad Hoc Working Group on the Harmonization of RID/ADR/ADN with the United Nations Recommendations on the Transport of Dangerous Goods

4. The Working Group was requested to check the tank codes and special provisions allocated to 4 new entries in Table A of chapter 3.2.

For the new entries UN 3531, UN 3532, UN 3533 and UN 3534 the tank codes and special provision TU 30, concerning the degree of filling, were confirmed to be correct. However in comparison to the portable tank special provisions it was felt that an equivalent to TP 6 was missing as a special provision. TE 11 was felt to be suitable and put in square brackets to check for the next session.

Proposal 1:

Add special provision TE11 in square brackets in column 13 of Table A of chapter 3.2 for the entries UN 3531, UN 3532, UN 3533 and UN 3534.

5. As a consequential amendment because a (+) was placed after the tank code, the new entries should be added to 4.3.4.1.3 (b).

Proposal 2:

Amend 4.3.4.1.3 (b) to read: (new wording in bold print)

(b) *Class 4.1:*

UN No. 2448 sulphur, molten: code LGBV;

UN No. 3531 polymerizing substance, solid, stabilized, n.o.s, UN No. 3533 polymerizing substance, solid, stabilized, temperature controlled, n.o.s.: code SGAN;

UN No. 3532 polymerizing substance, liquid, stabilized, n.o.s, UN No. 3534 polymerizing substance, liquid, stabilized, temperature controlled, n.o.s.: code L4BN.

Item 3: ECE/TRANS/WP.15/AC.1/2015/27 (UIC) – Carriage of tanks, battery-wagons / battery-vehicles and MEGC following the expiry of deadlines for periodic and intermediate inspections.

6. This topic was already discussed at the March 2015 session of the Working Group. The feeling expressed then was that RID/ADR journeys are typically shorter than maritime journeys for portable tanks, and extending the period between inspections would move the problem a bit further in time. Although some experts in the group were in favour, most experts did not support the proposal as it stood. UIC was invited to take account of the discussions, investigate procedures in other regulations and come with additional arguments in favour.

7. The Working Group discussed the new document which contained two main proposals, one concerning the possibility to carry the tank to its destination if, after filling, the expiry date of the inspection had passed. The other proposal concerned the possibility of returning a tank with a load after the expiry date for proper disposal or recycling of the contents.

8. On the first proposal it was stated that it was not primarily a technical issue. It was pointed out that for a limited period there are no immediate concerns for the safety of the tanks once the inspection dates are exceeded. Besides that carriage after the expiry date is

allowed for IBCs in Chapter 6.5 and portable tanks in Chapter 6.7, and in Chapter 6.8 there is a provision for the intermediate inspections to be performed up to 3 months later.

9. During discussion various views were exchanged. Some experts expressed the confusion that the different procedures between 6.7 and 6.8 might give for users and control authorities specially if it concerns tank containers/portable tanks with dual marking and the longer journeys and delays expected on the Asian-Europe rail connection. It was also said that tank containers might be filled from production for intermediate stock not knowing what the final destination would be nor the exact date of dispatch.

10. It was felt that if a proposal were to be adopted it should be mode specific, for rail transport one month was discussed. It was also remarked that when a proposal in this direction was considered the wording of 6.8.2.4.3 on the variation in intermediate inspection period should be taken into account.

11. Although there was no real support for an open ended approach (with no time limit) a tour de table resulted in 15 experts voting in favour of the principle, 2 abstentions and 2 against. The UIC is invited to come back with a revised proposal.

12. Concerning the second aspect, the return of a filled tank for proper disposal or recycling of the contents after the expiry date of the inspection was recognized as an issue. However the working group felt that the UIC should present a proper argumentation for the matter to be considered further.

13. On the final topic related to the modifications of 6.7.2.19.6, 6.7.3.15.6 and 6.7.4.14.6 by adding the wording "*and offered for carriage and accepted for carriage by the carrier*" no particular views were expressed recognizing that this was a matter for the UN.

Item 4: ECE/TRANS/WP.15/AC.1/2015/30 (OTIF) – Transitional provisions.

14. The working group endorsed the transitional measures for tanks proposed by the secretariat.

Item 5: ECE/TRANS/WP.15/AC.1/2015/31 (Latvia) – Proposal for amendments to special provisions TU21 of chapter 4.3 of RID/ADR.

15. The document by Latvia was welcomed by the working group and contained a proposal for a clarification and elaboration of the outcome of the discussion on TU 21 at the March 2015 session. Option 2 of the proposal was preferred.

16. Several questions were raised and discussed. A particular question concerned if the filling degree included the water. Contact with the industry expert who gave a presentation at the last meeting revealed that the fillings degree included the water.

17. The proposal was further improved and simplified. As a consequence it was decided also to amend the wording of TU 16 that was already adopted during the March session.

Proposal 3:

Replace the existing TU21 in 4.3.5 with the following:

TU21 *The substance shall be covered with a protective agent by one of the following measures:*

- (a) *water to a depth of not less than 12 cm at the time of filling. The degree of filling of the substance and the water at a temperature of 60 °C shall not exceed 98%; or*
- (b) *nitrogen, in which case the degree of filling at a temperature of 60 °C shall not exceed 96%; or*
- (c) *a combination of water and nitrogen, in which case the substance shall be covered with a water layer and the remaining space filled with nitrogen. The degree of filling of the substance and the water at a temperature of 60 °C shall not exceed 98%.*

When water is used as a protective agent according to (a) or (c) and low ambient temperatures are to be expected during the journey, sufficient anti-freeze agent shall be added to prevent freezing of the water. The anti-freeze agent shall be free from corrosive action and not liable to react with the substance.

When nitrogen is used as a protective agent according to (b) or (c), the remaining space shall be filled with nitrogen in such a way that, even after cooling, the pressure at no time falls below atmospheric pressure. The tank shall be closed in such a way that no leakage of gas occurs.

Proposal 4

Modify TU 16 to read as follows:

TU16 *Uncleaned empty tanks, shall, when handed over for carriage, either:*

- *be filled with nitrogen (with or without water); or*
- *be filled with water to not less than 96% and not more than 98% of their capacity; when low ambient temperatures are to be expected during the journey, sufficient anti-freeze agent shall be added to prevent freezing of the water. The anti-freeze agent shall be free from corrosive action and not liable to react with the substance.*

Item 6: ECE/TRANS/WP.15/AC.1/2015/39 (Norway) – Carriage of dangerous goods in MEGCs loaded on a vehicle equipped with a hydraulic hook lift hoist.

15. In the example of Norway the MEGCs were secured to the vehicle by the hook arm lift on the motor vehicle. There have been several accidents in Norway using this type of hook lift system for non-dangerous goods.

16. Norway posed two questions in her document;

- a) Loading a MEGC on to a vehicle, does only the cargo securing in 7.5.7.1 apply, or does the fastening requirements in ADR 9.7.3 apply?
- b) Does the MEGCs (multi-element gas containers) have to meet the definition of a container?

17. Norway questioned why there are no fastening requirements in chapter 6.8 for MEGCs when there are fastening requirements for UN MEGCs in chapter 6.7, and fastening requirements for tank-containers in 6.8.2.1.
18. This issue can be divided as follows: requirements for fastenings of the elements within the MEGC (6.8.3.1.5), requirements for fastenings for the MEGCs (6.8), requirements for fastenings on the vehicle (9.7.3) and fixing the MEGCs to the vehicles (7.5.7.4). Some delegates proposed to amend 6.8.3.1.5 to also cover the MEGCs and their fastenings. Others that an amendment should be made to 6.8.2.1.2.
19. Delegates had different interpretations of paragraph 9.7.3. Some felt that the first part is relevant for all 6.8 constructions, while the rest of the paragraph is relevant for tank-vehicles, battery-vehicles and vehicles carrying demountable tanks. Other delegations had interpreted only 6.8.2.1.16 to be relevant for tank-vehicles, battery-vehicles and vehicles carrying demountable tanks .
20. The UK had detected a mistake in the English text and with these corrections, it helped interpretation. However Norway would consider whether the text could be further improved.
21. The working group agreed that a MEGC is not a “container” as defined in 1.2.1.
22. Norway volunteered with assistance from EIGA to come back with a proposal to address these issues.

Proposal 5

Correct the paragraphs referred to in 9.7.3 to read (English version only)

9.7.3 Fastenings

Fastenings shall be designed to withstand static and dynamic stresses in normal conditions of carriage, and minimum stresses as defined in 6.8.2.1.2, 6.8.2.1.11 to ~~6.8.2.1.15~~ 6.8.2.1.13, 6.8.2.1.15 and 6.8.2.1.16 in the case of tank-vehicles, battery-vehicles, and vehicles carrying demountable tanks.

Item 7: ECE/TRANS/WP.15/AC.1/2015/51 (Netherlands) – Shells with protective linings +INF 28 (Belgium)

23. The representative of the Netherlands was of the view that an incident as occurred in the summer of 2013, when a tank loaded with hydrochloric acid developed a defect in the lining which resulted in large areas of the aluminium alloy shell dissolving within hours leading to significant leakage, is not acceptable. The proposal seeks to align 4.3.1.5 and 6.8.2.1.9 and in principle the combination of an aluminium alloy shell with lining and hydrochloric acid should not have used based on 4.3.1.5.
24. Belgium said on introduction of INF 28 that there are a significant number of tanks with aluminium alloy shells and lining in circulation. The defect of the lining which is the root cause was not addressed by the Netherlands. The provisions for application and inspection of the lining should be improved in chapter 6.8 in line with chapter 6.7.
25. Several experts felt that the proposal in 2015/51 was limiting the use of steel shells with a lining and therefore it was not acceptable. The Belgian approach received support but there were reservations regarding additional inspections. It was said that each test increased the risk of damage to the lining. Some experts suggested a simple ban of

aluminium alloy in combination with a lining for certain critical products as was proposed in an earlier document.

26. In conclusion the working group accepted the offer by Belgium to work together with the Netherlands and other interested parties to find a suitable solution for this issue based which would include detailed requirements on the application, monitoring and inspection.

Item 8: ECE/TRANS/WP.15/AC.1/2015/54 (Netherlands) – Limitations to the approval of vacuum insulated tanks for the carriage of LNG by indirect referenced standard.

27. For the construction of vacuum insulated containments standards EN 1251-2:2000 and EN 13530-2 have been referenced in RID/ADR. In both mentioned standards reference is made to EN 1252-1:1998 which is a specific standard for the toughness of the shell material at temperatures below -80 °C. However in the scope of this standard for toughness of the material, LNG is excluded.

28. It was felt that a note in the table where the construction standard is referenced would be the most appropriate place for this information. The note as proposed should be made more specific for the reference in 6.2.

29. It was proposed to ask the secretariat to request CEN TC 268 for a revision of the standard.

Proposal 6

Add a note to the table of 6.2.4.1 for EN 1251-2:2000 (new wording in bold italic script)

EN 1251-2:2000	Cryogenic vessels – Transportable, vacuum insulated, of not more than 1 000 litres volume – Part 2: Design, fabrication, inspection and testing <i>Note: Standard EN 1252-1:1998 referenced in this standard is also applicable to closed cryogenic receptacles for the carriage of UN No. 1972 (LNG).</i>	6.2.3.1 and 6.2.3.4	Until further notice	
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Proposal 7

Add a note to the table of 6.8.2.6.1 for EN 13530-2:2002 +A1:2004 (new wording in bold italic script)

EN 13530-2:2002	Cryogenic vessels – Large transportable vacuum insulated vessels – Part 2: Design, fabrication, inspection and testing	6.8.2.1 (with the exception of 6.8.2.1.17), 6.8.2.4, 6.8.3.1 and 6.8.3.4	Between 1 January 2005 and 30 June 2007	
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EN 13530- 2:2002 + A1:2004	Cryogenic vessels – Large transportable vacuum insulated vessels – Part 2: Design, fabrication, inspection and testing <i>Note: Standard EN 1252-1:1998 referenced in this standard is also applicable to tanks for the carriage of UN No. 1972 (LNG).</i>	6.8.2.1 (with the exception of 6.8.2.1.17), 6.8.2.4, 6.8.3.1 and 6.8.3.4	Until further notice	
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Item 9: INF 4 (CEN) – Request for advice from the Working Group on Tanks EN16522:2014.

30. As the standards had not been received by members of the working group discussion on this document was deferred to the next session.

Item 10: INF 10 (UK) – Tanks: informal Working Group on the inspection and certification of tanks.

31. The representative of the UK informed the working group on the outcome of first session that had been held in London on 15 & 16 June 2015. The next meeting is scheduled for 12 to 14 October 2015 in London.

Item 11: INF 17 (Germany) – Requirements to be met by MEGCs which consist of- non-UN pressure receptacles.

32. In chapter 6.8 there is no reference to standards for the construction of MEGCs. As there are no additional codes available it is proposed to apply the relevant parts of standard EN 13807 for this purpose. The scope of the standard is at this moment limited to battery vehicles.

33. The document was discussed and it is confirmed that standard EN 13807 is under revision and that the scope will be amended to include MEGCs. The note was amended to allow UN pressure receptacles to be used too as provided for in 6.8.3.1.4.

Proposal: 8

For RID: replace the current wording in 6.8.3.6 of RID “(reserved)” by the following :

NOTE: Persons or bodies identified in standards as having responsibilities in accordance with RID shall meet the requirements of RID.

Type approval certificates shall be issued in accordance with 1.8.7. The standard referenced in the table below shall be applied for the issue of type approvals as indicated in column (4) to meet the requirements of Chapter 6.8 referred to in column (3). The standards shall be applied in accordance with 1.1.5. Column (5) gives the latest date when existing type approvals shall be withdrawn according to 1.8.7.2.4; if no date is shown the type approval remains valid until it expires.

Since 1 January 2009 the use of the referenced standards has been mandatory. Exceptions are dealt with in 6.8.3.7

If more than one standard is referenced for the application of the same requirements, only one of them shall be applied, but in full unless otherwise specified in the table below.

The scope of application of each standard is defined in the scope clause of the standard unless otherwise specified in the Table below.

Reference	Title of document	Applicable sub-sections and paragraphs	Applicable for new type approvals or for renewals	Latest date for withdrawal of existing type approvals
(1)	(2)	(3)	(4)	(5)
EN 13807:2003	Transportable gas cylinders – Battery vehicles – Design, manufacture, identification and testing Note: where appropriate this standard may be applied to MEGCs which consist of pressure receptacles.	6.8.3.1.4 and 6.8.3.1.5, 6.8.3.2.18 to 6.8.3.2.26, 6.8.3.4.10 to 6.8.3.4.12 and 6.8.3.5.10 to 6.8.3.5.13	Until further notice	

Proposal: 9

For ADR introduce a note in column 2 of the table in 6.8.3.6 to read: (new wording in bold italic script)

Reference	Title of document	Applicable sub-sections and paragraphs	Applicable for new type approvals or for renewals	Latest date for withdrawal of existing type approvals
(1)	(2)	(3)	(4)	(5)
EN 13807:2003	Transportable gas cylinders – Battery vehicles – Design, manufacture, identification and testing. <i>Note: where appropriate this standard may also be applied to MEGCs which consist of pressure receptacles.</i>	6.8.3.1.4 and 6.8.3.1.5, 6.8.3.2.18 to 6.8.3.2.26, 6.8.3.4.10 to 6.8.3.4.12 and 6.8.3.5.10 to 6.8.3.5.13	Until further notice	

Item 12: INF 22 (Switzerland) – Clarification of the definition of the “Maximum working pressure” of a tank.

34. The purpose of this document is to raise awareness that different interpretations can be made on the definition of maximum working pressure in 1.2.1. This is in particular hindering development of standards in CEN TC 296.

35. The issue is the place in the tank where the maximum working pressure is to be taken. Particularly for tanks of 6.8.2.1.14 (a) with a calculation pressure of twice the static pressure of the substance to be carried but not less than twice the static pressure of water, this is of importance as the pressure at the lowest point of the tank due to the substance carried is substantial in relation to the opening pressure of the breather device.

36. Several experts welcomed the proposal by Switzerland to take the working pressure at the top of the tank in the ullage space, but that extreme care should be taken when amending the wording of the definition because of possible unintended consequences.

37. It was not possible to come to a conclusion during this session based on the informal document. Switzerland is invited to develop the proposal taking into account the discussions and Germany and the UK agreed to provide written contributions in due time for the next meeting.

Item 13: INF 23 (France) – Application of 6.8.3.2.17 : Inspection opening of shell intended for the carriage of refrigerated liquefied gases.

38. France questioned how other countries interpreted 6.8.3.2.17 in relation to non-vacuum insulated tanks for the carriage of refrigerated liquefied gases.

39. It was confirmed by several experts that 6.8.3.2.17 should be read in combination with 6.8.3.4.7 and 6.8.3.4.8. 6.8.3.2.17 allows that an inspection opening is not required for tanks for refrigerated gases, being vacuum insulated or non vacuum insulated. In relation to this 6.8.3.4.8 gives requirements for closing the tank after an opening is made for an internal inspection. 6.8.3.4.7 allows the internal inspection to be replaced by other tests making an opening in vacuum insulated tanks superfluous.

40. The conclusion is that for non-vacuum insulated tanks it is not required to have an inspection opening included in the design of the tank but that an opening should be made when an internal inspection is due. This opening needs to be closed again for instance by welding in a plate,

41. Current practice however is that non vacuum insulated tanks, which are mainly tanks for the carriage of carbon dioxide, have an inspection opening provided to prevent expensive and complicated procedures in use.

42. As it is the choice of the user or manufacturer of a tank for refrigerated gases to have an inspection opening included in the design or not, with the consequence of making an opening in the tank when internal inspection was required, no changes were deemed necessary.

43. As a result of the discussions there was a feeling that the wording of 6.8.3.2.17, 6.8.3.4.7 and 6.8.3.4.8 would benefit from a review.

Item 14: INF 24 (CEN) – Information on the revision of EN 14025 on the design and construction of metallic pressure tanks.

44. Information from CEN was that EN 14025 was being revised to include requirements for “Explosion pressure shock resistant” design of tanks. The draft will soon be circulated for formal vote.

45. UIP expressed concern regarding the calculation in B3 which was different from the German TRT6 and BAM investigation report and this should be brought to the attention of the relevant CEN working group and the standards working group.

Item 15: INF 29 (UK) – Tanks: Pressure testing using gas.

46. In this INF document the United Kingdom offered to submit an official proposal for the March 2016 session to discuss pressure testing with gas. This is a result of discussions held in CEN TC 296 working group 5 which met in June 2015 in Berlin.
