

**Economic and Social Council**Distr.: General
16 May 2017

Original: English

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****Report of the Joint Meeting of the RID Committee of Experts
and the Working Party on the Transport of Dangerous
Goods on its spring 2017 session***

held in Bern from 13-17 March 2017

Addendum****Annex I****Report of the Working Group on Tanks**

1. The Working Group on Tanks met from 13 to 15 March 2017 in Bern on the basis of the mandate from the RID/ADR/ADN Joint Meeting, under the chairmanship of Mr. Arne Bale (United Kingdom) and with Mr. Kees de Putter (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 twenty-five experts and representatives of twelve countries and six non-governmental organizations, dealt with the following official and informal documents:

* Circulated by the Intergovernmental Organisation for International Carriage by Rail (OTIF) under the symbol OTIF/RID/RC/2017-B. 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.

** Circulated by the Intergovernmental Organisation for International Carriage by Rail (OTIF) under the symbol OTIF/RID/RC/2017-A/Add.1.

Documents: ECE/TRANS/WP.15/AC.1/2017/3 (Germany)
ECE/TRANS/WP.15/AC.1/2017/13 (EIGA)
ECE/TRANS/WP.15/AC.1/2017/17 (Netherlands)
ECE/TRANS/WP.15/AC.1/2017/18 (Netherlands)
ECE/TRANS/WP.15/AC.1/2017/19 (Netherlands)
ECE/TRANS/WP.15/AC.1/2017/20 (France)
ECE/TRANS/WP.15/AC.1/2017/21 (France)
ECE/TRANS/WP.15/AC.1/2017/22 (United Kingdom)
ECE/TRANS/WP.15/AC.1/144 (Secretariat)

Informal documents: INF.6 (UIP)
INF.7 (United Kingdom)
INF.8 (ECFD)
INF.11 (Belgium)
INF.12 (United Kingdom)
INF.13 (United Kingdom)
INF.25 (United Kingdom)
INF.27 (Germany)

Item 1: ECE/TRANS/WP.15/AC.1/2017/3 (Germany) – Introduction of a definition of diameter of shell

3. The proposal by Germany was to improve the understanding that, when used, the term “diameter of the shell”, meant, the internal diameter. To achieve this a definition was proposed.

4. The Group agreed at the previous session that this interpretation is correct for Chapter 6.8. Some experts considered that the definition also concerns Chapter 6.7. Although there was consensus the meaning should be the same in Chapter 6.7, it was questioned whether this could be decided by the Joint Meeting. It was said that this should be brought to the attention of the Sub-committee of Experts on the Transport of Dangerous Goods.

5. The proposed definition was amended to better address all situations where this term was used in chapters 6.8 and 6.7, with an explanation that it applied to shells of tanks only, to avoid conflicts in other places where the term may be used with another meaning, e.g. for explosive articles.

Proposal 1: Introduce a new definition in 1.2.1 to read:

“*Diameter*” (for shells of tanks) means the internal diameter of the *shell*.

Item 2: ECE/TRANS/WP.15/AC.1/2017/13 (EIGA) – 6.8.3.2.9 Items of equipment - Relief valves

6. The EIGA document was a continuation on the proposal for the protection of safety valves against ingress of water in document ECE/TRANS/WP.15/AC.1/2016/26 of the autumn 2016 session. The main objective was to exempt safety valves of cryogenic tanks from the requirement of protection against ingress of water when this was possible. Additional modifications were proposed to the already approved wording for 6.8.3.2.9 and the consequential transitional requirement.

7. It was agreed that the proposed note was not needed as 6.8.3.2.9 addresses tanks for compressed, liquefied and dissolved gases. Safety valves for tanks for refrigerated liquefied gases are dealt with in 6.8.3.2.11. It was felt that the already approved wording of the autumn 2016 session for the new last paragraph of 6.8.3.2.9 could be clearer. Further amendment was made to describe the objective, as in Chapter 6.7, rather than prescribing a measure (cap). The transitional measure was found to be too short for industry to modify existing equipment.

It was agreed that it should be complied with at the first intermediate or periodic inspection after 1 January 2021.

Proposal 2: Introduce a new paragraph at the end of 6.8.3.2.9 to read:

Safety valves shall be designed to prevent or be protected from the entry of water or other foreign matter which may impair their correct functioning. Any protection shall not impair their performance.

Proposal 3: Amend the transitional measures 1.6.3.47 and 1.6.4.49 to read:

Fixed tanks (tank-vehicles) and demountable tanks / tank wagons / tank-containers built before 1 July 2019, fitted with safety valves meeting the requirements applicable up to 31 December 2018 but which do not meet the requirements of 6.8.3.2.9 last paragraph concerning their design or protection applicable from 1 January 2019 may continue to be used until the next intermediate or periodic inspection after 1 January 2021.

Item 3: ECE/TRANS/WP.15/AC.1/2017/17 (Netherlands) - Rupture pressure of bursting discs in 6.8.2.2.10

8. The document contained answers to questions raised during the autumn 2016 session on this subject and proposals for amendment taking these answers into account. It was confirmed that hermetically closed tanks for the carriage of gases, with a safety valve preceded by a bursting disc, were foreseen and that, when the definition of “hermetically closed” had been modified in the past, the application to gas tanks had been overlooked. It was also found that for compressed, liquefied or dissolved gases a bursting pressure of 10% above the opening pressure of safety valves might result in a pressure higher than the test pressure.

9. It was discussed how this affected battery-vehicles and MEGCs carrying toxic gases. The conclusion was that 6.8.3.2.26 prescribed that if a safety valve is fitted it should be preceded by a bursting disc. The example given for non toxic gases in which only a bursting disc is fitted will result in an “N” in the fourth position in the (tank) code. EIGA intended to clarify the situation of battery-vehicles only equipped with bursting discs.

10. Another discussion concerned the lowering of the bursting pressure in relation to the temperature. A bursting pressure of 10% above the opening pressure of the safety valve at 15°C could result in a bursting pressure below the opening pressure of the safety valve at higher temperatures. It was explained that although in 6.7.2 10% was used this was related to a higher opening pressure of the safety valve in relation to the MAWP which partly compensated for the decrease of the bursting pressure at higher temperatures. For Chapter 6.8 tanks a burst pressure of 0.9 to 1.0 times the test pressure at 15°C was said to be more appropriate. It was decided to keep the new value in square brackets for later confirmation.

11. Concerning the use of the word “substances” in combination with “liquid” and “solid” in the definition of “hermetically closed tank” it was decided that this should remain as this was the terminology used in the present definition.

Proposal 4: Amend the definition of “hermetically closed tank” in 1.2.1 to read:

“Hermetically closed tank” means a tank that:

- is not equipped with safety valves, bursting discs, other similar safety devices or vacuum valves ((RID only) or with self-operating ventilation valves); or
- is equipped with safety valves preceded by a bursting disc according to 6.8.2.2.10, but is not equipped with vacuum valves ((RID only) or with self-operating ventilation valves).

A tank intended for the carriage of liquid substances with a calculation pressure of at least 4 bar or intended for the carriage of solid substances (powdery or granular) regardless of its calculation pressure is also considered hermetically closed if it:

- is equipped with safety valves preceded by a bursting disc according to 6.8.2.2.10 and vacuum valves ((RID only) or with self-operating ventilation valves), in accordance with the requirements of 6.8.2.2.3; or,
- is not equipped with safety valves, bursting discs or other similar safety devices, but is equipped with vacuum valves ((RID only) or with self-operating ventilation valves), in accordance with the requirements of 6.8.2.2.3.

Proposal 5: Modify the second paragraph of 6.8.2.2.10 to read (new wording in *italic script*, deleted wording ~~stricken~~ through):

The bursting disc shall rupture at a nominal pressure [between 0.9 to 1.0 times the test pressure], except for tanks intended for the carriage of compressed, liquefied or dissolved gases where ~~the~~ The arrangement of the bursting disc and safety valve shall be such as to satisfy the competent authority. A pressure gauge or other suitable indicator shall be provided in the space between the bursting disc and the safety valve, to enable detection of any rupture, perforation or leakage of the disc which may disrupt the action of the safety valve.

Proposal 6: Introduce a transitional measure to read:

“1.6.3.yy /1.6.4.xx

Fixed tanks (tank-vehicles) and demountable tanks / tank wagons / tank-containers constructed before 1 July 2019 in accordance with the requirements in force up to 31 December 2018 but which do not conform to the requirements of 6.8.2.2.10 concerning the nominal pressure of the bursting disc applicable as from 1 January 2019 may continue to be used [until the next periodic inspection.]”

Item 4: ECE/TRANS/WP.15/AC.1/2017/18 (Netherlands) – Inclusion of provisions for flame arresters on breather devices

12. Based on document ECE/TRANS/WP.15/AC.1/2016/20 by CEN during the autumn 2016 session it was decided not to refer to EN 16522 but instead include references to applicable sections of EN ISO 16852 directly in the requirements of 6.8.2.2.3. Although during the autumn session a table and wording had already been drafted it was preferred to have this as an official proposal for consideration at a future session.

13. As some experts were not present during the autumn 2016 session the background and considerations of not referencing to EN 16522 were recalled. It was said that while EN 16522 was still available this could give rise to confusion as to what to apply. It was also mentioned that while the reference to EN ISO 16852 had been “copied and pasted” from EN 16522, the standard had been revised in 2016 and this should be taken into account. Because the contents should first be checked the original date was kept in square brackets.

14. The work on flame arresters made by the ADN Safety Committee was mentioned. However it was found that, as this application was only for flame arresters on breather devices, used mainly on tanks carrying liquid fuels, references to the applicable sections of EN ISO 16852 would not lead to problems.

15. Although flame traps and flame arresters may be covered by the definition of flame arrester in EN ISO 16852, allowing flow and protecting against passage of flame, it was decided to keep the wording flame trap as it was commonly used terminology.

Proposal 7: Add a new last paragraph (RID: penultimate paragraph) to 6.8.2.2.3 to read:

Flame arresters for breather devices shall be suitable for the vapour emitted by the substances carried (maximum experimental safety gap – MESH), temperature range and application. They shall meet the requirements and tests of EN ISO 16852:[2010] for the situations given in the table below:

Application/Installation	Testing requirements
Direct communication with atmosphere	EN ISO 16852:[2010], 7.3.2.1
Communication to pipe work system	EN ISO 16852:[2010], 7.3.3.2 (applies to valve/flame arrester combinations when tested together)
	EN ISO 16852:[2010], 7.3.3.3 (applies to flame arresters tested independently of the valves)

Proposal 8: Introduce a new transitional measure in 1.6.3.xx/1.6.4.xx to read:

“1.6.3.xx/1.6.4.xx

Fixed tanks (tank-vehicles) and demountable tanks/Tank-wagons/Tank-containers constructed before 1 July 2019 in accordance with the requirements of 6.8.2.2.3 in force up to 31 December 2018 but which however do not conform to the requirements of 6.8.2.2.3 last paragraph concerning the flame arresters on breather devices applicable from 1 January 2019 may continue to be used.”

Item 5: ECE/TRANS/WP.15/AC.1/2017/19 (Netherlands) – Amendment of subsection 6.8.2.1.23

16. The document contained two independent proposals for amendment of 6.8.2.1.23 and a transitional measure to allow existing tanks to continue to be used.

17. The first proposal modified 6.8.2.1.23 to allow lap joints to be inspected by a non-destructive test other than radiography or ultrasound. The reason for this was that the results were difficult to interpret. Based on experience with existing tank designs, it was considered that this should be limited to the attachment of the ends to the shell wall. As this was a typical construction of gravity discharge tanks a footnote was considered the most appropriate way to deal with this exception.

Proposal 9: Introduce a new footnote in the last sentence of the first paragraph of 6.8.2.1.23:

Non-destructive tests shall be carried out by radiography or by ultrasound ^x and shall confirm that the quality of the welding is appropriate to the stresses.

^x *Lap joints used for joining an end to the shell wall may be tested using alternative methods to radiography or ultrasound.*

18. The second proposal specified additional areas to be tested when shell ends are composed of two or more plates welded together before forming the end. In the so called “knuckle” area of the end, cracks might develop during forming of the end. The testing of the cylindrical part of the end in these cases was deleted as this would already be subject to the inspection of the weld “Tee” junctions connecting the end to the shell wall. During discussion some minor editorial changes were made to bring the wording of 0.8 Lambda and 0.9 Lambda in line with each other.

Proposal 10: Amend 6.8.1.23 Lambda = 0.8: to read (deleted wording ~~stricken~~ through and new wording in *italic script*)

All weld beads shall so far as possible be inspected visually on both faces and shall be subject to non-destructive checks. The non-destructive checks shall include all weld “Tee” junctions ~~and~~, all inserts used to avoid welds crossing *and all welds in the knuckle area of the tank ends*. The total length of welds to be examined shall not be less than: (rest unchanged)

Proposal 11: Amend 6.8.2.1.23, Lambda = 0.9 to read: (deleted wording ~~stricken~~ through, new wording in *italic script*)

All weld beads shall so far as possible be inspected visually on both faces and shall be subject to non-destructive checks. The non-destructive checks shall include all connections, *all* inserts used to avoid welds crossing, ~~and all welds in the knuckle area of the tank ends~~ and *all* welds for the assembly of large-diameter items of equipment. The total length of welds to be examined shall not be less than: (rest unchanged)

Proposal 12: Introduce a new transitional measure 1.6.3.z.z and 1.6.4.z.z to read:

“1.6.3.z.z/1.6.4.z.z

Tank-wagons/Fixed tanks (tank-vehicles) and demountable tanks/Tank-containers constructed before 1 July 2019 in accordance with the requirements in force up to 31 December 2018 but which do not however conform to the requirements of 6.8.2.1.23 concerning the check of the welds in the knuckle area of the tank ends applicable as from 1 January 2019 may still be used.

Item 6: ECE/TRANS/WP.15/AC.1/2017/20 (France) – Tanks with a section including a concave part – interpretation of 6.8.2.1.18, and informal document INF.8 (ECFD)

19. The document by France questioned whether a tank with a circular cross section and a cut-out conformed to the regulations. Informal document INF.8 from ECFD commented on the points raised by France.

20. After an exchange of views between the experts it was recognized that different interpretations were possible. One interpretation was that the cross section of the tank was circular with a part taken out, and another interpretation was that, due to the cut-out, the cross section had become another shape to which footnote 2 of 6.8.2.1.18 applied, including a requirement that shell walls shall have convex radii. Despite the different interpretations, the Group felt that such tanks were safe and should be allowed to be used under ADR.

21. It was also remarked that circular, box-shape and elliptical cross sections were to be considered as examples and that the regulations should not hinder technical development. The particular design dated back to 1989 and around 2000 units entered into service without any problems experienced with the shell.

22. It was agreed that the regulations needed modification to allow for other designs and prevent different interpretations. The representative of the United Kingdom offered to develop a proposal for a preliminary exchange of views. This exchange of views could be addressed by the informal working group on inspection and certification of tanks that would meet in June 2017, before being returned back to the Working Group on Tanks at the autumn 2017 session of the Joint Meeting. In the meantime the CEN working group responsible for EN 13094 was encouraged to conclude the work on the draft revision of the standard.

Item 7: ECE/TRANS/WP.15/AC.1/2017/21 (France) – Demountable tanks – tank-containers, interpretation of definitions

23. France questioned whether the tank on a road vehicle shown on a picture in the document had to be considered as a tank-container or as a demountable tank. While some

experts were of the opinion that this could only be a tank-container because of the corner castings, others were of the opinion that it could only be a demountable tank because of the foldable legs and cabinet extending below the corner castings; some experts felt that the question could not be answered because design information was missing.

24. It was also questioned whether a tank-container could be approved for road use only. As the definition of container in 1.2.1 specifies one or more means of transport it was assumed that this was possible.

25. The varying opinions of the experts seemed to justify revisiting the definitions of demountable tank and tank-container in the future, keeping in mind that some of these definitions are multi-modal.

Item 8: ECE/TRANS/WP.15/AC.1/2017/22 (United Kingdom) – Report of the informal working group on the inspection and certification of tanks, and informal documents INF.12 and INF.13 (United Kingdom)

26. The United Kingdom asked on behalf of the informal working group on the inspection and certification of tanks for endorsement of the fundamental principles developed and agreed by the group and for the consent of the Joint Meeting to continue its work.

27. The fundamental principles were as follows. When a type approval is issued by one Contracting Party, other contracting parties have to accept this type approval. Tanks built according to this type approval should have the initial inspection performed by the country in which the tank is to be registered or alternatively the country of manufacture if accepted by the competent authority in which the tank is to be registered. An “entry into service inspection” should be conducted by the country in which the tank is to be registered if the initial inspection is not done by the country of registration. While tanks according to the type approval would be registered in different contracting parties, it was expected that by cross control, harmonisation would improve and that there would be a constant form of market surveillance. Inspection bodies were to be appointed by contracting parties according to common requirements and when appointed it was intended that they would be notified to the UNECE/OTIF secretariats who would publish a list of inspection bodies on their websites.

28. The experts of the Working Group on Tanks acknowledged that the fundamental principles could be implemented. However it was questioned whether there would be a separate system for tanks intended for the carriage of substances of classes 3 to 9 that would be established in parallel to that applicable to transportable pressure equipment. Several observations were made on the wording for competent authority in paragraph 5a, the registration of tank-containers and the application of a single inspection body. It was explained that so far only the new section for Chapter 6.8 had been reproduced in informal document INF.12 and that the corresponding requirements in 1.8.6 and 1.8.7 were still under development.

29. The Working Group supported continuation of this work and all interested parties were invited to submit comments and to participate in the informal working group that is planned to reconvene from 6 to 8 of June 2017 in London.

Item 9: Informal document INF.6 (UIP) – Welding operations in accordance with 6.8.2.1.23

30. There was in principle general support for the proposal by UIP, to clarify that the requirements of 6.8.2.1.23 were also applicable to repair shops undertaking welding. It was also confirmed that EN 12972 describes how to test tanks but not by whom.

31. The Group discussed where the proposed texts would be best placed in the regulations. As the heading of 6.8.2.1 is “Construction” and not “Repair or modification” it was suggested that 6.8.2.4.4 would be a suitable place as it was expected that those parties dealing with

repair would look there first. Another option would be an amendment to 6.8.2.1.23 as proposed in informal document INF.6. Finally it was considered that a footnote to 6.8.2.1.23, stating that “*in the case of a repair, alteration or modification of a tank the requirements applying to the manufacturer shall likewise apply to the maintenance or repair shop performing the welding*”, was also a promising option.

32. UIP was advised to develop the proposal further along this line and to present this in an official document for a future session.

Item 10: Informal document INF.7 (United Kingdom) – Identification of the State in whose territory the type approval for a fixed tank (tank vehicle), demountable tank or battery vehicle was granted

33. Several experts said that the country identification was already used in the number assigned to the type approval of tanks in their country. Other experts said that introducing this would not be a problem but that a transitional measure was necessary for type approvals already issued. Although no transitional measure was proposed it was decided to accept the wording on the condition that it should be kept in square brackets until a transitional measure is adopted. The United Kingdom agreed to prepare a working document with a transitional measure for the next session.

Proposal 13: Delete the dividing line of the second bullet point of 6.8.2.3.1 and amend the wording to read:

- [an approval number for the type which shall consist of the distinguishing sign used on vehicles in international road traffic (RID)⁹(ADR)⁸ of the State in whose territory the approval was granted and a registration number;]

Item 11: Informal document INF.11 (Belgium) – Holding time – Information in the transport document

34. The proposal was to extend the requirement for entering the actual holding time in the transport document for portable tanks carrying refrigerated liquefied gases.

35. It was questioned whether this had additional value as 4.2.3.7.2 already required the actual holding time to be marked on the portable tank itself. Belgium was invited to reconsider the proposal and return with an official document if this was found necessary.

Item 12: Informal document INF.25 (United Kingdom) – Pressure test using another liquid or gas

36. After a brief discussion the Working Group decided to defer consideration of the proposal until a separate standard for testing with a gas has been developed by the CEN working group. In the meantime the United Kingdom would prepare a working document on the fundamental principles for pressure testing using a gas.

Item 13: Informal document INF.27 (Germany) – Procedure for type approval of tanks

37. The document contained three questions concerning type approval of tanks.

38. Question 1 concerned the type approval of a so called “family” of tanks, notably which tank of the “family” had to be design type tested. It was answered that the worst-case situation should be verified by calculation while the prototype test may be performed on a representative example.

39. Question 2 concerned the application of EN 12972 for type approval. It was answered that for tanks for the carriage of gases this standard could be used because of the reference in 1.8.7.8 but not for other tanks as the table of 6.8.2.6.2 only applied to inspections and testing. Reference to an updated version of EN 12972 should also be considered. It may be used for type approval on a voluntary basis.

40. Question 3 dealt with the approval of service equipment as part of the tank approval. It was stated that test reports by other inspection bodies could be accepted for the approval of the tank. It was expected that the informal working group on inspection and certification of tanks would solve this problem in the near future.

Item 14: ECE/TRANS/WP.15/AC.1/144, Annex II – Proposals for amendments to RID/ADR/ADN

41. Concerning the amendments in square brackets in Annex II of ECE/TRANS/WP.15/AC.1/144:

- The transitional measures 1.6.3.47 (page 15) and 1.6.4.49 (page 16) have been modified by proposal 3 of this report;
- Regarding transitional measures in 1.6.3.48 and 1.6.4.50 it was agreed to use the wording suggested by the secretariat shown in footnotes 2 and 3 on page 16;
- For 6.8.2.2 (page 20) it was decided to place the requirement in a new paragraph to be numbered 6.8.2.2.11 and to remove the square brackets;
- 6.8.3.2.9 was modified by proposal 2 shown above;
- 6.8.3.2.6 and 6.10.3.8 (f) (page 21): the square brackets may be removed.

42. As a consequence of removing the square brackets in relation to the requirements for level gauges, a transitional measure is needed for existing equipment to continue to be used.

Proposal 14: Introduce a new transitional measure in 1.6.3 and 1.6.4 to read:

1.6.3.x.x/1.6.4.x.x

Fixed tanks (tank-vehicles) and demountable tanks/tank-containers constructed before 1 July 2019 in accordance with the requirements in force up to 31 December 2018 but which however do not conform to the requirements of 6.8.2.2.11 applicable from 1 January 2019 may continue to be used.
