

## 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

16 September 2020

### Report of the Working Group on Tanks

1. The Working Group on Tanks met from 10 to 11 and 14 to 16 September 2020 on a virtual basis on the mandate from the RID/ADR/ADN Joint Meeting, under the chairmanship of Mr. Arne Bale (United Kingdom) 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. For the Working Group on Tanks 47 experts registered for participation from 16 countries and 5 non-governmental organizations. They dealt with the following official and informal documents:

*Documents:*

- ECE/TRANS/WP.15/AC.1/2020/1 (EIGA)
- ECE/TRANS/WP.15/AC.1/2020/6 (OTIF)
- ECE/TRANS/WP.15/AC.1/2020/7 (France)
- ECE/TRANS/WP.15/AC.1/2020/12 (UIP/UIC)
- ECE/TRANS/WP.15/AC.1/2020/16 (France)
- ECE/TRANS/WP.15/AC.1/2020/17 (France)
- ECE/TRANS/WP.15/AC.1/2020/18 (France)
- ECE/TRANS/WP.15/AC.1/2020/19 (United Kingdom)
- ECE/TRANS/WP.15/AC.1/2020/20 (United Kingdom)
- ECE/TRANS/WP.15/AC.1/2020/26 (Poland)
- ECE/TRANS/WP.15/AC.1/2020/31 (Russian Federation)
- ECE/TRANS/WP.15/AC.1/2020/32 (Russian Federation)
- ECE/TRANS/WP.15/AC.1/2020/33 (Russian Federation)
- ECE/TRANS/WP.15/AC.1/2020/34 (Russian Federation)
- ECE/TRANS/WP.15/AC.1/2020/35 (Russian Federation)
- ECE/TRANS/WP.15/AC.1/2020/45 (UIP)
- ECE/TRANS/WP.15/AC.1/2020/47 (Ireland)
- ECE/TRANS/WP.15/AC.1/2020/48 (United Kingdom)
- ECE/TRANS/WP.15/AC.1/2020/49 (United Kingdom)

*Informal documents:*

INF 6 Rev1(United Kingdom)	INF 43 (Belgium)
INF 9 (OTIF Secretariat)	INF 44(Belgium)
INF 13 (Netherlands)	INF 45 (ITCO)
INF 15 (Belgium)	INF 46 (Germany)
INF 17 (EIGA)	INF 54 (United Kingdom)
INF 31 (Germany)	INF 56 (Poland)
INF 32 (Germany)	INF 57 (United Kingdom)
INF 33 (UIP)	INF 63 (United Kingdom)

**Section 1: Outcome of discussions requiring endorsement by the Joint Meeting.**

**Item 1: ECE/TRANS/WP.15/AC.1/2020/6 (OTIF) – Extra-large tank-containers and INF 45 (ITCO).**

3. The document contained two issues. On the issue of fixing of welded elements to the shell there was consensus among the experts that provisions should express the purpose and not be design restrictive. A more general new wording was introduced that would be suitable for tank-containers as well as tank-vehicles. It was remarked that the text for tank- wagons in the French language version could be improved by lining the wording up with those of the English version.

***Proposal 1: in 6.8.2.2.1RID after the first sentence, righthand side introduce new text to read (new text in Italic script):***

To prevent tearing of the shell due to accidental stresses, welded elements shall be fixed to the tank as follows:

– Underframe connection: securing by means of a pad ensuring distribution of dynamic loads;

– Supports for upper gangway, access ladder, drainage pipes, valve control mechanisms and other load transmission brackets: securing by means of weld-on reinforcement plate;

– Appropriate dimensioning or other protective measures (e.g. designated breaking point).

*Welded elements shall be attached to the shell in such a way that tearing of the shell is prevented.*

**Proposal 2: Introduce new text after the first sentence in 6.8.2.2.1 of ADR to read (new wording in Italic script):**

*“Welded elements shall be attached to the shell in such a way that tearing of the shell is prevented.”*

4. For 6.8.2.2.4 no consensus could be reached on the mandatory fitment of 4 bar man-lids on tank-containers. In particular for tank-containers for powdery substances with a “G” in the tank code this would not be justified due to surge. A suggestion to limit the proposed requirement to tank-containers with a capacity of more than 40.000 litres was not carried. It was suggested that the proposal should be reconsidered at the next RID Standing Working Group in November 2020 together with a possible transitional measure.

**Item 2: ECE/TRANS/WP.15/AC.1/2020/1 (EIGA) – Periodic and intermediate inspections of tanks intended for the carriage of refrigerated liquefied gases, and ECE/TRANS/WP.15/AC.1/2020/7 (France):**

5. Although several experts were of the opinion that 6.8.3.4.6 only provided a derogation of periodicity of the intermediate inspection between periodic inspections and not between the initial and first periodic inspection it was said that this was not interpreted this way in practice. Refrigerated liquefied gases are non-corrosive, non-toxic and this would justify the longer inspection periods. Between experts no unwanted effects or dangerous situation were known due to not performing an intermediate inspection after the initial inspection.

There was consensus that the requirements for tank-containers needed amendment and should be treated in a similar way as tank-wagons and tank-vehicles.

**Proposal 3: Amend 6.8.3.4.6 (RID and ADR) to read:**

“6.8.3.4.6 For tanks intended for the carriage of refrigerated liquefied gases:

(a) By derogation from the requirements of 6.8.2.4.2, the periodic inspections shall take place

(RID) at least after eight years	at least after eight years
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(ADR) at least after six years	
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of service and thereafter at least every 12 years.

(b) By derogation from the requirements of 6.8.2.4.3, the intermediate inspections shall take place at least six years after each periodic inspection.”

**Proposal 4: introduce a new transitional measure in 1.6.4.xy to read:**

“1.6.4.xy Tank-containers which do not comply with the requirements of 6.8.3.4.6 applicable from 1 January 2023, may continue to be used if an intermediate inspection takes place at least 6 years after each periodic inspection performed after 1 July 2023.”

**Item 3: ECE/TRANS/WP.15/AC.1/2020/26 (Poland) – Proposal of amendment to 4.3.3.3.2 of RID/ADR.**

6. As this relevant information is already contained in the transport documents and orange plates there was consensus to delete 4.3.3.3.2 for tank-vehicles and tank-containers. However reservations were made regarding the so-called foldable panels on tank-wagons covered in the EN standard 15877-1:2012 and described in 4.3.3.4.1 (a) and 6.8.3.5.7. It was suggested to adopt the deletion also for tank-wagons but keep it in square brackets for the time being until confirmation of the deletion could be given by the RID standing working group.

**Proposal 5: 4.3.3.3.2 RID place the existing text in square brackets in the left-hand side column make the text only applicable to tanks and battery wagons (new words in *Italic script*, deleted words *stricken through*):**

[When tanks <i>or</i> battery wagons <del>or MEGC's</del> are handed over for carriage, only the particulars specified in 6.8.3.5.6 applicable to the gas loaded or just discharged shall be visible; all particulars concerning other gases shall be covered up (see standard EN 15877-1:2012 Railway applications – Marking on railway vehicles. Part 1: Freight wagons).]	
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**Proposal 6: 4.3.3.3.2 ADR, delete the current text in 4.3.3.3.2 and amend to read:**

4.3.3.3.2 (Deleted)

**Item 4: ECE/TRANS/WP.15/AC.1/2020/31 (Russian Federation) – Thermal insulation of tanks (special provision TE14 in 6.8.4) and INF 9 (OTIF).**

7. It was explained that in some cases the heating system was attached to the outside of the shell and that in such places the outermost surface of the heating element should be insulated with suitable insulating material.

8. There was consensus with the principle of the proposal, but further editorial changes were made. In particular the use of “and/or” was subject to discussion where in the English and French language respectively “or” and “ou” would be preferable, while in German “or” would result in “one or the other”. Finally, it was decided to keep and/or as it appears in several places in the regulations.

***Proposal 7: amend Special Provision TE 14 of 6.8.4 to read:***

“TE 14 Tanks shall be equipped with thermal insulation. The thermal insulation directly in contact with the shell and/or components of the heating system shall have an ignition temperature at least 50 °C higher than the maximum temperature for which the tank was designed.”

**Item 5: ECE/TRANS/WP.15/AC.1/2020/32 (Russian Federation) –Method of heat treatment of materials for welded shells (6.8.2.1.10, 6.8.2.1.11 and 6.8.2.6.1) and INF 9 (OTIF).**

9. It was questioned that water-quenched steel should not be used for manufacturing welded steel shells. This provision is only included in 6.8.2.1.10. second paragraph of RID, applicable both to tank-wagons and tank-containers.

There was agreement that in principle water-quenched steels could be used if they demonstrated sufficient ductility and good weldability. To guarantee this the ratio of 0,85 between Re/Rm in the first sentence of 6.8.2.1.11 is essential.

The question where the ratio 0.85 Re/Rm originated from could not be answered. It was said however that this ratio was present in all technical codes for transport tanks and in chapter 6.7. It was suggested to address this issue to the UN ECOSOC Sub-Committee of Experts on the Transport of Dangerous Goods (TDG).

***Proposal 8: RID only, delete the first sentence of the second paragraph of 6.8.2.1.10 (deleted wording stricken through):***

“~~Water quenched steel may not be used for welded steel shells.~~”

**Item 6: ECE/TRANS/WP.15/AC.1/2020/34 (Russian Federation) – Material used in vessels carrying UN No. 2031, concentrated nitric acid with more than 70% nitric acid) (special provision TC6 of section 6.8.4) and INF 9 (OTIF).**

10. The proposal is to include aluminum alloys in the scope of special provision TC6, as part of the justification was alignment with the use of these materials for packagings referred to in 6.1.4.2.1. It was said that due to technical development and tests other alternatives were available apart from aluminum 99,5 % pure that would reduce tank weight.

As compatibility of the shell material in general is regulated in 4.3.2.1.5 and 6.8.2.1.9 it was confirmed that special provision TC6 essentially contained an exemption to limit wall thickness to 15 mm regardless if the pressure and material properties in calculation would arrive at higher thicknesses. As the suitable aluminum alloys are considered to have better mechanical properties than pure aluminum, resulting in a stronger tank, there is no reason not to grant the same exemption.

**Proposal 9: amend TC6 of 6.8.4 to read:**

“TC 6           The wall thickness of tanks made of aluminium not less than 99% pure or aluminium alloy need not exceed 15 mm even where calculation in accordance with 6.8.2.1.17 gives a higher value.”

**Section 2: Informal Working group on the inspection and certification of tanks (the London Working Group).**

**Item 7: ECE/TRANS/WP.15/AC.1/2020/19 (United Kingdom) – Report of the thirteenth session of the informal working group on the inspection and certification of tanks, ECE/TRANS/WP.15/AC.1/2020/20 (United Kingdom), ECE/TRANS/WP.15/AC.1/2020/47 (Ireland), ECE/TRANS/WP.15/AC.1/2020/49 (United Kingdom), INF 6 Rev1 (United Kingdom), INF 15 (Belgium), INF 17 (EIGA), INF 31(Germany), INF 32 (Germany), INF 33 (UIP), INF 43 (Belgium), INF 44 (Belgium), INF 46 (Germany), INF 57 (United Kingdom) and INF 63 (United Kingdom).**

11.    The plenary charged the working group on tanks with taking forward the concluding remarks of the Chair of the Joint Meeting on three tasks.

a)       To formulate a survey for the contracting parties to clarify the direction of the work concerning the application of national systems for the approval of inspection bodies. On this matter the Chair of the London group offered to prepare an informal document setting out the survey questions for the working group on tanks to consider for the Joint Meeting. After some deliberation the group agreed on a set of five different scenarios, including the scenario proposed in INF.6/Rev.1, with each successive scenario limiting further the activities of inspection bodies approved according to a national system. On this basis the member countries of the Joint Meeting are invited by way of the survey to indicate their preferred scenario for RID/ADR 2023. As the Joint Meeting may have questions and require clarification before responding to the survey it is expected that the survey will be conducted during the spring session of the Joint Meeting in March 2021.

b)       To advise the Joint Meeting on how to proceed with the Entry Into Service Verification (EISV). On this matter there was consensus in the group that the intention is for the EISV to be a market surveillance or market intelligence led activity which takes place on an occasional rather than on a systematic basis. It was therefore concluded that more appropriate wording should be developed by the Informal Working Group on the inspection and certification of tanks during the session planned for 16 and 17 December 2020, taking into account the deliberations of the RID standing working group.

c)       To advise on the use of Type C accredited inspection bodies. It was felt by many in the working group that regardless of accreditation to ISO/IEC 17020 the independence of Type C inspection bodies was nevertheless questionable. It was proposed however that Ireland and the UK would prepare a joint proposal which would reflect the direction already given by the Chair of the Joint Meeting. This proposal would take into account the comments and observations from the Joint Meeting and the Tanks Working Group given the limitations and controls that would be needed in light of the non-independence of Type C inspection bodies.

***Section 3: Results of discussions on documents that do not require endorsement of the outcome.***

**Item 8: ECE/TRANS/WP.15/AC.1/2020/12 (UIP/UIC) – Clarification on using tanks after the deadline specified for the next test or inspection and INF 56 (Poland).**

12. Subsection 4.3.2.3.7, introduced in RID/ADR 2017, regulates the use of tanks after the deadline for the next test or inspection had expired. However, 4.3.2.3.7 does not apply to intermediate inspections because of the flexibility already built in 6.8.2.4.3. In 6.8.2.4.3 the intermediate inspection is to be performed 3 months before or after the due date. In earlier discussions this 3 months past the due date led to different interpretations whether the tank could be filled and carried during this period. The proposal is to clarify the situation by limiting the use in these 3 months to finish a transport operation or return of dangerous goods for disposal or recycling in the spirit of what was already in 4.3.2.3.7 for periodic inspections.

13. Most experts that spoke were of the opinion that 6.8.2.4.3 was written in such way that the tank could be used unlimited, including filling, in the 3 months after expiry of the due date of the intermediate inspection. It was stated that passing the due date of the intermediate inspection did not mean that the tanks were suddenly unsafe. However, it was noted that this unlimited use was compromised by the obligations of the filler in 1.4.3.3 (b). As the tank in the 3 months could not be used unlimited it was suggested to delete the 3 months past the due date from 6.8.2.4.3 and apply the same rules as for periodic inspections already in 4.3.2.3.7, or in combination with the proposed new paragraph (c).

It was agreed that there should be a common understanding and interpretation of the text in 6.8.2.4.3 but after discussion no consensus could be reached. However UIP is invited to submit a new document.

**Item 9: ECE/TRANS/WP.15/AC.1/2020/16 (France) – Vacuum-insulated double-wall tanks.**

14. The document asked for interpretation of the requirements for protection of the rear of the tank of tank-vehicles. In 9.7.6 of ADR the distance from the rear of the bumper to the tank is described. However, in some cases the distance to the shell is used as this is the part to be protected. In particular for vacuum insulated tanks the outer insulating jacket is of rather thin material but when damaged in an accident may result in the loss of vacuum and subsequent warming up of the tank and possible loss of product.

15. Several experts confirm the reading that if “tank” is described the distance to be considered is that of the rear of the bumper to the rear outermost parts of the insulation system. It was however remarked that this provision goes back to the original ADR and that “shell” and “tank” were not so strictly defined as nowadays, allowing for interpretation at that time. It was said that it was not clear what should be seen as the rear of the bumper, and this should also be clarified. It was noted that a document concerning this topic was also forwarded to WP.15.

**Item 10: ECE/TRANS/WP.15/AC.1/2020/17 (France) – Use of the table in 6.8.2.6.1 referencing the standards on the design and construction of tanks and their equipment.**

16. The document sought the opinion of the experts if type approvals of tanks need to be updated or renewed when new standards for equipment were introduced. For example, does the still valid type approval of a tank issued before certain standards for valves were referenced in RID/ADR be updated after the valve standards have been introduced?

17. In general type approvals shall be checked each time a new version of RID/ADR would appear as described in 6.8.2.3.3 second paragraph. If a new standard would be referenced, that is mandatory, this shall be taken into account as well. It was stressed however that if a new version of such equipment standard would appear and there is no end date in column 5 it would not be necessary to update the type approval of the tank. It was also expressed that the text of 6.8.2.3.3 would not allow for an update of the type approval as the type approval should be withdrawn by the competent authority or the body designated by that authority, resulting in a new type approval. It was felt that the choice should be given to the holder to update or withdraw. The discussion should be continued taking into account 6.8.2.3.3 and the equivalent provision in 1.8.7.

**Item 11: ECE/TRANS/WP.15/AC.1/2020/18 (France) – Inspections of tanks whose deadlines for intermediate inspections have expired, ECE/TRANS/WP.15/AC.1/2020/45 (UIP) and ECE/TRANS/WP.15/AC.1/2020/48 (United Kingdom).**

18. When an intermediate inspection was overdue by more than 3 months, as allowed by 6.8.2.4.3, what inspection would then be appropriate? In 2020/18 it is proposed, in line with recent amendments for 6.7, that this would be a periodic inspection. In 2020/48 this was extended further to overdue periodic inspections and tanks that had been out of service for a considerable time.

19. Most experts that spoke were of the opinion that the normal due inspection should be performed and saw from experience over many years no additional safety benefits by performing more stringent inspections. Document 2020/45 mentioned that consequential cleaning for the periodic test would lead to high costs and pressure on the environment. More hydraulic pressure test can introduce moisture into the tank leading to corrosion. The obligation of the filler in 1.4.3.3.(b) to check the date of the inspection had not expired would stop the use of these tanks before filling. It was said that the regulations currently did not give enough guidance for inspection bodies on how to act in case of overdue inspections.

It was therefore decided to take the comments made on board and the UIP volunteered to return with a new proposal for a future session.

**Item 12: ECE/TRANS/WP.15/AC.1/2020/33 (Russian Federation) – Calculation of the minimum shell thickness (6.8.2.1.13, 6.8.2.1.16, 6.8.2.1.16, 6.8.2.1.17, 6.8.2.4.1).**

20. The document questioned the consistency between the mentioned subsections of the regulations and in particular 6.8.2.1.16. and 6.8.2.1.13.

21. Concerning 6.8.2.1.16 the document expressed uncertainty if the limitations to permissible stress ( $\sigma$ ) were related to the calculation of the wall thickness based on the test pressure only, or also on the calculation pressure. As this is explained in the key to the formulas in 6.8.2.1.17 it becomes clear that the limitations to  $\sigma$  apply to both calculation- and test pressure determination of minimum wall thickness. However, no consensus could be achieved if the word “test pressure” in the first sentence of 6.8.2.1.16 should be deleted to apply to both situations or if “calculation pressure” should be added to the same effect.

It was decided that in this matter requires further careful consideration as this touches the very foundations of tank requirements.

22. Concerning 6.8.2.1.13 the problem seemed to exist in the wording “The pressure on which the shell thickness is based shall not be less than the calculation pressure.”. The meaning is that the wall thickness based on the calculation pressure is the minimum, other situations may result in higher wall

thicknesses based on 6.8.2.1.4 or 6.8.2.1.17 to 6.8.2.1.21 are greater and overrule the wall thickness based on calculation pressure. It was felt that this needed no further amendment. It is proposed to keep the document on the table for consideration at a future session.

**Item 13: ECE/TRANS/WP.15/AC.1/2020/35 (Russian Federation) – External stress values for the internal stop valve and its seating (para 6.8.2.2.2).**

23. It was said that in the current wording the stresses that would act on the stop-valve and its seating was not understood. Therefore, it was proposed to change the wording to clarify that it was in particular stresses occurring from emergencies.

24. The proposal was however not carried by the majority of the group of experts. It was felt that the current wording was more general and wider addressing all sorts of incidents from torque due to overtightening a cap at the end of the pipe, stresses relating to weight of adjacent equipment, forgetting to disconnect a hose or an impact by a foreign object such as a road vehicle. Reference was made to standard EN 14433:2014 which specified a breakaway test (in paragraph 7.6) for the external valve casing of the foot valve (internal stop valve) that has to be passed for design approval. After the test the sealing capability of the valve should not be affected. The proposed amendment was not carried as it was felt that the current wording was sufficient and had proven itself over many decades.

**Item 14: INF 13 (Netherlands) – Interpretation of subsection 6.8.3.2.3 in ADR**

25. The Netherlands asked for the confirmation of the working group if the vapour recovery line of tanks for flammable refrigerated liquefied gases (e.g. LNG / H<sub>2</sub>) should be provided with 3 closures in series of which the closest to the tank should be provided with the automatic closing safety function required by 6.8.3.2.3. The wording in 6.8.3.2.3 and 6.8.3.2.7 were felt to be open to interpretation. Reference was made to EN 14564:2019 in which an explanatory drawing showing 3 closures was included in Annex F.

26. There was general consensus that the position of the Netherlands could be confirmed although it could not be guaranteed that all tanks in service have the automatic closing safety function. It was said that the texts of 6.8.3.2 and the standards for tanks for refrigerated liquefied gases were not easy to understand and that the text of 6.8.3.2 may benefit from a review. The Netherlands was invited to forward an official document for a future session.

**Item 15: INF 54 (United Kingdom) - Tanks: Marking of serial number on tank shells.**

27. It was proposed to introduce a requirement for the manufacturer's serial number to be stamped on the shell to ensure identification if the tank plate was lost or removed.

28. It was noted that this stamping of the serial number in the shell is already included in the type approval requirements of EN 12972:2018 and will be a mandatory requirement from 1 January 2022 (6.8.2.6.1). It was thought not necessary to include it in the regulation itself. On the application to existing tanks the group also felt that there was no justification for this and the proposal was therefore not adopted.

**Item 16: Other business**

29. The members of the Tanks Working Group would like to thank Mr. Ernst Winkler for his contributions and camaraderie over the many years he was active in the group and wish him well in his future work.