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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 2016 session[1]

held in Bern from 14–18 March 2016

Addendum[2]

Annex I

Report of the Working Group on Tanks

1. The Working Group on Tanks met from 14 to 16 March 2016 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 28 experts from 12 countries and 7 non-governmental organizations, dealt with the following official and informal documents :

Documents: ECE/TRANS/WP.15/AC.1/2016/10 (Romania)
ECE/TRANS/WP.15/AC.1/2016/11 (Norway)

[1] Circulated by the Intergovernmental Organisation for International Carriage by Rail (OTIF) under the symbol OTIF/RID/RC/2016-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.

[2] Circulated by the Intergovernmental Organisation for International Carriage by Rail (OTIF) under the symbol OTIF/RID/RC/2016-A/Add.1.

ECE/TRANS/WP.15/AC.1/2016/12(United Kingdom)
ECE/TRANS/WP.15/AC.1/2016/13 (United Kingdom)
ECE/TRANS/WP.15/AC.1/2016/17 (Switzerland)

Informal documents: INF. 5 (OTIF)
INF. 16 (Russian Federation)
INF. 17(United Kingdom)
INF. 21 (UIC/CEFIC)
INF. 36 (OTIF)
INF. 45 (France)
INF. 48 (United Kingdom)
INF. 49 (France)

Due to time restraints the following informal documents could not be dealt with and are postponed to the next session.

INF. 10 (CEN)
INF. 12 (Netherlands)
INF. 13 (Netherlands)
INF. 18 (EIGA)
INF. 34 (Russian Federation)
INF. 38 (AEGPL)
INF. 39 (AEGPL)

Item 1: ECE/TRANS/WP.15/AC.1/2016/10 (Romania) – Definitions of reference steel and mild steel.

3. The intention of the document is to study the consequences of the deletion of the definitions of reference steel and mild steel in 6.7 in favour of those already present in 1.2.1 in RID/ADR. As requested by Romania the Working Group discussed the meaning of the definitions in the context of 2.2.7 in combination with 6.4, 6.5, 6.7 and 1.2.1 in combination with 6.8.

4. The Group could agree that the meaning and values of the definitions of mild steel and reference steel in 1.2.1 in combination with 6.8 and 6.7 have the same contents, despite some additional wording in the definition of mild steel in 6.7. On technical grounds there are no severe consequences to be expected by replacing the definitions of 6.7 by the definitions of 1.2.1.

However it was questioned if moving the definitions out of a set of approximately 15 other definitions in 6.7.2, 6.7.3 and 6.7.4 would be a worthwhile exercise.

5. Concerning the use of the term “reference steel” in 6.5 for IBCs it was questioned if “mild steel” would have been more appropriate here. Reference steel has theoretical values for calculation purposes only and mild steel to indicate a range of low carbon steels that need no equivalent wall thickness calculation.

The Group felt not to be in the position to confirm if the relation of the definition of mild steel in 1.2.1 was in line with the requirements in 2.2.7 and 6.4 or not.

It was suggested that Romania should verify with the experts at the United Nations level if the definition of reference steel that is currently in 1.2.1 is suitable to 6.5 and the definition mild steel is suitable for 2.2.7/6.4. Depending on the outcome of this verification it should be considered if in the future the definitions need to be limited to tanks only.

Item 2: ECE/TRANS/WP.15/AC.1/2016/11 (Norway) – Proposal for amendment for MEGCs and tank-containers in Chapter 6.8

6. Based on document 2015/39 which concerned MEGC/ tank-container placed on a carrying vehicle by a so called hook arm lifting system, and in this particular case a MEGC. Norway proposes amending the requirements in chapter 6.8 for the fastenings of MEGC including elements and frame, and for those meeting the definition, compliance with the CSC convention. Additionally it contains proposals to improve the requirements concerning the fastening of the MEGC and tank-containers on the vehicle. This document is based on the discussions during the autumn 2015 session and co-operation with EIGA.

7. It was discussed that MEGCs of 6.8 do not by definition need corner castings/twist locks, they may be fixed to the carrying vehicle by other means. It was also expressed that in the case of hook arm systems the bending moment in the frame of the MEGC should be taken into account in the design, where appropriate.

8. Proposal 1 in the document was discussed and the principle was agreed by the group. It was however felt that the wording could be improved in line with the wording of 6.8.2.1.2 for tank-vehicles and tank-containers.

Proposal 1:

For RID/ADR amend 6.8.3.1.5 to read: (new wording in **bold *italic*** script)

6.8.3.1.5	Elements and their fastenings ***of battery wagons / battery vehicles***	Elements and their fastenings ***and the frame of MEGCs***
	Shall be capable of absorbing, under maximum permissible load the forces defined in 6.8.2.1.2. Under each force the stress at the most severely stressed point of the element and its fastenings shall not exceed the value defined in 6.2.5.3 for cylinders, tubes pressure drums and bundles of cylinders and for tanks the value of σ defined in 6.8.2.1.16.	

9. In Proposal 2 it is suggested to extend the acceleration forces as mentioned in 6.8.2.1.2, and equivalent sections of 6.7, to all vehicles carrying a tank in 9.7.3 of ADR. Some experts felt that this would result in more severe requirements for vehicles carrying tank-containers, portable tanks and MEGCs than they are designed for at this moment. In normal conditions of carriage as mentioned in 9.7.3 road vehicles will experience 0.8 G and no problems are known concerning the strength of vehicles carrying containers. Additional complications may be expected by stating a maximum weight for containers on the ADR certificate of the vehicle. It was recognized that this was an ADR only issue.

10. It was decided not to amend the wording of 9.7.3 for the time-being because the question why ADR has not taken over the requirements in 7.2.2. of the UN Model Regulations could not be answered by the Group and the intention in 7.5.7.4 in relation with 7.5.7.1 was not clear. It was felt, as this was an ADR only issue that vehicle experts and involved road haulier associations were not present this could not be answered. The secretariat is requested to bring this to the attention of WP.15.

11. Proposal 3 concerning the inclusion of MEGCs in 7.1.3 was agreed by a majority of the experts.

Proposal 2:

For RID/ADR: Amend 7.1.3 to read (new text in **bold *italic*** script):

7.1.3 Large containers, portable tanks, ***MEGCs*** and tank-containers which meet the definition of "container" given in the CSC (1972), as amended, or in UIC leaflets 591 (status at 01.10.2007, 3rd edition), 592-2 (status at 01.10.2004, 6th edition), 592-3 (status at 01.01.1998, 2nd edition) and 592-4 (status at 01.05.2007, 3rd edition) may not be used to carry dangerous goods unless the large container or the frame of the portable tank, ***MEGC*** or tank-container satisfies the provisions of the CSC or of UIC leaflets 591 and 592-2 to 592-4."

Item 3: ECE/TRANS/WP.15/AC.1/2016/12 (United Kingdom) – pressure test using gas

12. RID/ADR allows for the hydraulic pressure test in 6.2, 6.7 and 6.8 to be performed with a gas instead of a liquid with the agreement of the competent authority. However in 6.8 it is allowed only in “special cases”. Special cases are not defined and it is proposed to delete this restriction to align 6.8 with 6.2 and 6.7.

13. The United Kingdom gave a presentation which showed that it would be possible for a test using gas not to present unacceptable risks when compared to a test using liquid based on experience in the United Kingdom when testing gravity-discharge tanks as defined in 6.8.2.1.14(a) during periodic inspections.

Some experts expressed reservations and could not agree with the alignment proposed by the United Kingdom. It was also stated that the proposed amendments would allow tanks with a higher pressure to also be tested with gas. While some delegations reported accidents others reported positive long term experiences when pressure testing gravity discharge tanks using gas as a medium. The view was expressed that it may be possible to develop standardized procedures for safe working conditions.

14. The Group was of the view that no changes should be accepted and that in the meantime CEN/TC 296/WG 5 should set aside the issue of gas testing and special cases to conclude the next revision of EN 12972 in time for reference in RID/ADR 2019. It was suggested that a specific standard concerning gas testing should then be developed.

Item 4: ECE/TRANS/WP.15/AC.1/2016/13, INF 17 and INF 48 (United Kingdom) – Tanks: informal working group on the inspection and certification of tanks.

15. The informal working group met for a second session on 12-14 October 2015 and a third session on 11-13 January 2016 in London to discuss control and monitoring of inspection bodies, options for mutual recognition of tests, and inspection and construction requirements of tanks. The United Kingdom informed the tanks working group on the proceedings, including the United Kingdom experience with non-compliant tankers and the key outcomes from the United Kingdom research, and noted the following topics to be discussed: the questionnaire on the activities of appointed inspection bodies, amendment of requirements for welding and inspection of welds (6.8.2.1.23), non-destructive checks of welds in positions on a tank that are particularly vulnerable to accident damage and the possibilities for remote visual internal inspection.

16. The questionnaire reproduced as Annex A to INF 17 was discussed and several suggestions for improvement were made and agreed with the United Kingdom. Proposed improvements were the inclusion of open boxes to the questions to allow explanatory comments to be given and a more user-friendly format.

With these improvements the Group endorsed the questionnaire for distribution to RID Contracting States and ADR Contracting Parties.

17. Amendments to 6.8.2.1.23 agreed upon by the informal working group at the third session were in principle accepted by the experts. However it was expressed by most experts that the wording should be further improved. In the light of developments in the

informal working group and the requests for further improvement some experts suggested amendments to be approved in the report of the Joint Meeting. Initially some experts expressed a desire for the amendments to aim for RID/ADR 2019, but after much discussion the majority of the Group agreed on the following amendments and consequential transitional measures for existing tanks for RID/ADR 2017.

Proposal 3:

RID/ADR replace the current wording of 6.8.2.1.23 by:

"6.8.2.1.23 The ability of the manufacturer to perform welding operations shall be verified and confirmed by either the competent authority or by the body designated by this authority, which issues the type approval. A weld quality assurance system shall be operated by the manufacturer. Welding shall be performed by qualified welders using a qualified welding process whose effectiveness (including any heat treatments required) has been demonstrated by tests. Non-destructive tests shall be carried out by radiography or by ultrasound and shall confirm that the quality of the welding is appropriate to the stresses.

The following checks shall be carried out for welds made by each welding process used by the manufacturer in accordance with the value of the coefficient λ used in determining the thickness of the shell in 6.8.2.1.17:

λ = 0.8: all weld beads shall so far as possible be inspected visually on both faces and shall be subjected to non-destructive checks. The non-destructive checks shall include all weld "Tee" junctions and all inserts used to avoid welds crossing. The total length of welds to be examined shall not be less than:

10% of the length of all the longitudinal welds,
10% of the length of all the circumferential welds,
10% of the length of all the circumferential welds in the tank ends, and
10% of the length of all the radial welds in the tank ends.

λ = 0.9: all weld beads shall so far as possible be inspected visually on both faces and shall be subjected to non-destructive checks. The non-destructive checks shall include all connections, inserts used to avoid welds crossing, and welds for the assembly of large-diameter items of equipment. The total length of welds to be examined shall not be less than:

100% of the length of all the longitudinal welds,
25% of the length of all the circumferential welds,
25% of the length of all the circumferential welds in the tank ends, and 25% of the length of all the radial welds in the tank ends.

λ = 1: all weld beads throughout their length shall be subjected to non-destructive checks and shall so far as possible be inspected visually on both faces. A weld test-piece shall be taken.

In the cases of either λ = 0.8 or λ = 0.9, when the presence of an unacceptable defect is detected in a portion of a weld, the non-destructive checks shall be extended to a portion of equal length on both sides of the portion that contains the defect. If

the non-destructive checks detect an additional defect that is unacceptable, non-destructive checks shall be extended to all remaining welds of the same type of welding process.

Where either the competent authority or a body designated by this authority has doubts regarding the quality of welds, including the welds made to repair any defects revealed by the non-destructive checks, it may require additional checks."

Proposal 4:

RID/ADR - Introduce new transitional measures in 1.6.4 and 1.6.5 to read:

"1.6.3.X Tank wagons/fixed tanks (tank-vehicles) and demountable tanks constructed before 1 July 2017 in accordance with the requirements in force up to 31 December 2016 but which do not however conform to the requirements of 6.8.2.1.23 applicable as from 1 January 2017 may still be used."

"1.6.4.Y Tank-containers constructed before 1 July 2017 in accordance with the requirements in force up to 31 December 2016 but which do not however conform to the requirements of 6.8.2.1.23 applicable as from 1 January 2017 may still be used."

18. The Group discussed additional wording to 6.8.2.1.23 suggested by the United Kingdom to control the quality of welds in positions on a tank that are particularly vulnerable to accident damage in the event of lateral impact and overturning. It was remarked that in the informal working group no consensus had been reached on this issue and that the wording was not previously circulated to the tanks working group. Some experts expressed that the proposed wording may not give the result that the United Kingdom envisaged. It is suggested that this issue is further discussed in a future session of the informal working group.

19. The question posed in paragraph 7 of document 2016/13 on whether remote visual inspection methods are allowed to replace direct visual inspection by a person entering a tank was discussed. Several delegates expressed their reservations based on earlier experiments with remote visual inspection. It was also said that as far as harmonisation between tests and testing bodies was concerned no alternative methods should be allowed unless sufficiently developed and documented so that the methods can be used uniformly by all inspection bodies. It was also stated that scientific and technological progress should not be hindered. It is suggested that the informal working group should explore whether technical progress has resulted in suitable systems for remote visual inspection.

Item 5: ECE/TRANS/WP.15/AC.1/2016/17 (Switzerland) and INF.49 (France) – Clarification of the definition of "maximum working pressure" for tanks.

20. This topic was discussed during the autumn 2015 session based on informal document INF.22. The definition of Maximum working pressure gives examples where the pressure develops. However it is open to interpretation in all the examples if the pressure due to the weight of the substance in the tank is included which is a particular effect for gravity discharge tanks of 6.8.2.1.14 (a). Since the last session the proposal has been further developed to clarify the meaning.

21. The key aspect of the proposal is that the definition of Maximum Working Pressure is not appropriate for gravity-discharge tanks according to 6.8.2.1.14(a).

It was stated that since the last session of the Working Group new information had become available and the principle of the proposal was now acceptable. It was also felt that the wording needed further refinement to be acceptable. It was confirmed that a gravity- discharge tank that would see occasionally an internal pressure due to bottom loading, equipped with a breather

device could still be regarded as a tank according to 6.8.2.1.14(a) without a maximum working pressure.

Additional consequential amendments were deemed necessary to define the test pressure for compartments of gravity-discharge tanks according to 6.8.2.1.14(a) which were included in INF.49 from France.

22. After discussion and modification of the proposals the following amendments are proposed:

Proposal 5:

RID/ADR - amend the first sentence of the definition of maximum working pressure in 1.2.1 , add a new Note 1 at the end of the definition and renumber the existing notes 1 and 2 as note 2 and 3 (new text in ***bold Italic*** script).

"*Maximum working pressure (gauge pressure)*" means the highest of the following three pressures ***that may occur at the top of the tank in the operating position:***

Note 1: Maximum working pressure is not applicable to gravity-discharge tanks according to 6.8.2.1.14 (a).

For the French text only add "compressed, liquefied or dissolved" in the last paragraph of the definition and make editorial corrections in (c).

Proposal 6:

Amend the wording of 6.8.2.4.1 in the fourth paragraph from below left side of the dividing line to read: (new wording in **bold *Italic*** script)

The test shall be carried out on each compartment at a pressure at least equal to***:***

- 1.3 times the maximum working pressure***, or***

-1.3 times the static pressure of the substance to be carried but not less than 1.3 times the static pressure of water with a minimum of 20 kPa (0,2 bar) for gravity-discharge tanks according to 6.8.2.1.14(a).

Proposal 7:

Amend the penultimate paragraph of 6.8.2.4.3 to read: (deleted wording ~~stricken through~~, new wording in **bold *italic*** script)

For tanks equipped with breather devices and a safety device to prevent the contents spilling out if the tank overturns, ~~the pressure test shall be equal to the static pressure of the filling substance~~ ***the leakproofness test shall be carried out at a pressure at least equal to the static pressure of the most dense substance to be carried, the static pressure of water or 20 kPa (0,2 bar) whichever is the highest.***

Item 6: INF.36 (OTIF) – Special provision 640.

23. The proposal by OTIF to delete special provision 640E for UN numbers 1133, 1139, 1169, 1197, 1210, 1263, 1266, 1286, 1287, 1306, 1866, 1993 and 1999, for each first entry for packing group III in column was confirmed to be correct by the Working Group.

Item 7: INF.45 (France) – Modification of the expression "vapour space" in the French version of RID/ADR.

24. The proposal to replace the various terms used for " vapour space" in the French version of RID/ADR was confirmed to be correct by the French speaking experts of the Working Group.

Item 8: INF.21 (UIC/CEFIC) Carriage of tanks, battery wagons/battery-vehicles and MEGC following the expiry of deadlines for periodic and intermediate inspections.

25. This subject was discussed in the Working Group on two earlier occasions. The proposal is to allow tanks that are filled prior to the expiry date of the inspection of the approval of the tank to be carried to the final destination within a month. An additional proposal concerned the possibility for a load to be returned for disposal within a three month period.

26. Most experts expressed support for the proposals in INF.21, whilst one had reservations in general, and another about the types of tanks involved. It was discussed that the flexible period of three months before or after the due date to perform the intermediate inspection in 6.8.2.4.3 allowed for the carriage up to three months after the due date. It was then concluded that only the month after the due time for the periodic inspection would be required and the wording was amended accordingly. The question was raised as to which competent authority should approve the carriage for disposal or return after three months, but the proposed wording is consistent with existing text for IBCs and portable tanks.

Proposal 8:

RID/ADR Include a new 4.3.2.3.7 to read:

"4.3.2.3.7 Tank-wagons, demountable tanks, battery-wagons (RID) / fixed tanks (tank-vehicles), demountable tanks, battery-vehicles (ADR), tank-containers, tank swap bodies and MEGCs may not be filled or offered for carriage after the deadline for the test or inspection required by 6.8.2.4.2, 6.8.3.4.6 and 6.8.3.4.10 has expired.

However, tank-wagons, demountable tanks, battery-wagons (RID) / fixed tanks (tank-vehicles), demountable tanks, battery-vehicles (ADR), tank-containers, tank swap bodies and MEGCs filled prior to the date of expiry of the last periodic inspection may be carried:

(a) for a period not to exceed one month after the expiry of these deadlines;

unless otherwise approved by the competent authority, for a period not to exceed three months after the expiry of these deadlines in order to allow the return of dangerous goods for proper disposal or recycling. Reference to this exemption shall be mentioned in the transport document."

Proposal 9:

RID/ADR Amend 5.4.1.1.11 to read as follows: (new wording in ***bold italic*** script)

"5.4.1.1.11 Special provisions for the carriage of IBCs, ***tanks, battery-wagons (RID) / battery-vehicles (ADR)***, portable tanks ***and MEGCs*** after the date of expiry of the last periodic test or inspection

For carriage in accordance with 4.1.2.2 (b), 4.3.2.3.7 (b), 6.7.2.19.6 (b), 6.7.3.15.6 (b) or 6.7.4.14.6 (b), a statement to this effect shall be included in the transport document, as follows:

"CARRIAGE IN ACCORDANCE WITH 4.1.2.2 (b)",

"CARRIAGE IN ACCORDANCE WITH 4.3.2.3.7 (b)",

"CARRIAGE IN ACCORDANCE WITH 6.7.2.19.6 (b)",

"CARRIAGE IN ACCORDANCE WITH 6.7.3.15.6 (b)" or

"CARRIAGE IN ACCORDANCE WITH 6.7.4.14.6 (b)" as appropriate.

Proposal 10:

Insert in the note to 1.4.2.2.1 (d) before " 4.3.2.4.4"

" 4.3.2.3.7"

Item 9: INF.16 (Russian Federation) Proposal for the amendment of special provisions TU21 and TU16 of Chapter 4.3 of RID/ADR/ADN/Annex 2 to SMGS

27. It was stated that the information in the wording for TU 16 and TU 21 would be more user friendly if reproduced in tables rather than in the wording as adopted for RID/ADR 2017. However the proposal contained also modified requirements in comparison with what was accepted for RID/ADR 2017. Although an increased level of water was proposed for RID/ADR to harmonize with SMGS Annex 2 it was agreed to maintain the existing level agreed for RID/ADR 2017. For traffic between RID/ADR states and SMGS Annex 2 states the requirement for the higher depth of water needed to be complied with.

It was agreed to modify the tables for TU 16 and TU 21 in line with the information in the earlier approved TU 16 and TU 21.

Proposal 11:

Amend special provision TU21 to read as follows:

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

Protective agent	A layer of water in the tank	Degree of filling of the substance (including water if any) at a temperature of 60° C shall not exceed	Additional requirements for carriage at low ambient temperatures
Nitrogen*	–	96%	-
Water and nitrogen*	–	98%	The water shall contain sufficient anti-freeze agent to prevent it from freezing. The anti-freeze agent shall be free from corrosive action and not
Water	Not less than 12 cm	98%	

			liable to react with the substance.

*) *The remaining space of the tank 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."*

Amend special provision TU16 to read as follows:

"TU16 When handed over for carriage, uncleaned empty tanks shall be filled with a protective agent fulfilling one of the following measures:

Protective agent	Degree of filling of water	Additional requirements for carriage at low ambient temperatures
Nitrogen*	–	–
Water and nitrogen*	–	
Water	Not less than 96% and not more than 98%	The water shall contain sufficient anti-freeze agent to prevent it from freezing. The anti-freeze agent shall be free from corrosive action and not liable to react with the substance.

* *The tank 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.*

(RID only:)

An additional entry shall be included in the transport document:

"Tank filled with _____* in accordance with special provision TU 16."

___

* Indicates the name(s) of the protective agent(s). Where the tank is filled with water, its mass shall be indicated in kg; in the case of nitrogen, its pressure shall be given in MPa or bar."

Item 10: INF.5 (OTIF)

28. In paragraph 33 of informal document INF.5 OTIF reports of a change to the wording approved for RID which may also be changed for ADR for the tank record in 4.3.2.1.7. The Group agreed to introduce in the second paragraph the wording "without delay" ("sans delai" in French) in ADR.