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TO THE MEMBER STATES OF OTIF, ASSOCIATE MEMBERS of OTIF AND TO REGIONAL ORGANISATIONS WHICH HAVE ACCEDED TO COTIF

Final report of the 16th session of the RID Committee of Experts' working group on tank and vehicle technology

(Krakow, 19 and 20 November 2018)

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1. At the invitation of Poland, the 16th session of the RID Committee of Experts' working group on tank and vehicle technology was held on 19 and 20 November 2018 in Krakow.

2. The following RID Contracting States took part in the work of the 16th session of the working group on tank and vehicle technology (see also Annex I):

   Belgium, France, Finland, Germany, Netherlands, Poland, Romania, Switzerland, Turkey and the United Kingdom.

   The European Union for Railways (ERA) was also represented.

   The following non-governmental international organisations were represented: the European Chemical Industry Council (CEFIC), the International Union of Railways (UIC), the International Union of Wagon Keepers (UIP), the International Union of Combined Road-Rail Transport Companies (UIRR) and the Association of the European Rail Industry (UNIFE).

3. As decided at the 44th session of the RID Committee of Experts (see report OTIF/RID/CE/2007-A, paragraph 108), Mr Rainer Kogelheide (UIP) chaired the meeting and Mr Arne Bale (United Kingdom) was the deputy chairman.

ITEM 1: Approval of the agenda

Document: RID-18022-CE (Secretariat)

4. The provisional agenda contained in calling notice RID-18022-CE dated 14 September 2018 was adopted.

ITEM 2: Interim report by CEFIC on the risk assessment of extra-large tank-containers (BTC)

Informal document: INF.2 (CEFIC)

5. The Chairman pointed out that the aim of this meeting should be to decide which questions raised in the risk assessment of extra-large tank-containers (BTC) should be dealt with in order to avoid further questions arising later.

6. The representative of CEFIC again informed the meeting of the new transport practice BASF had introduced, whereby it had been possible to reduce the time to get tank-containers ready at the unloading terminal to one hour, as opposed to 22 hours for tank-wagons. In the market, the extra-large tank-containers were called BASF Class Tank-Containers (BTC) and were also marketed under this name. BASF and van Hool had patented this new class of tank-container (total weight more than 40 tonnes, capacity at least 50,000 litres).

7. New 5L[1] carrying wagons had been built for the carriage of BTC, 342 of which BASF would have in use by the middle of 2019. HUPAC and Kombiverkehr also possessed numerous newly built carrying wagons approved for the carriage of BTC. The new carrying wagons placed in service by BASF, which had been approved for the carriage of BTC, were fitted with reinforced spigots and long stroke buffers (C buffers; 150 mm instead of 105 mm stroke) and some of them were also fitted with disc brakes.

[1] "5L" refers to the five main improvements, all of which begin with the letter L in German: quiet, light, heavy-duty, logistics-capable and life cycle-cost oriented.

8. The BTC already in use had been manufactured by Magyar and Van Hool and had a capacity of 53, 63 or 73 m^3. They were made of high-grade steel and had reinforcement rings and compared with conventional tank-containers, they had a much strengthened frame that allows them to be stacked up to six high, which was an advantage in terms of safety. Most of the tanks had insulation and heating coils and some were fitted with a lining (rubber coating). 350 BTC were already in use and another 600 would be delivered by the end of 2019.

9. The risk assessment will compare three different systems with each other:

   – Carriage in conventional tank-wagons,
   – Carriage in conventional tank-containers on conventional carrying wagons,
   – Carriage in BTC on innovative 5L carrying wagons.

10. The risk assessment will include the following work packages in which, unless otherwise stated, the three systems referred to will be compared.

11. Work package 1: Comparison of the technical documentation relating to the materials used and the technical specifications.

12. Work package 2: Experimental trials of driving behaviour, during which data on forces and accelerations on curves with different load conditions will be collected.

13. Work package 3: Modelling and simulation of driving behaviour, in which various scenarios at increasing speeds will be considered.

14. Work package 4: Finite element modelling and analysis of accident scenarios, with a particular focus on the scenario of the overriding of buffers at various speeds.

15. Work package 5: Impact tests with overriding of buffers and subsequent analysis of the damage. The representative of CEFIC pointed out that these tests were voluntary and went above and beyond the CSM requirements.

16. Work package 6: Long term behaviour of BTC on new carrying wagons, where tank-containers filled to 50% and 100% are hump shunted on a daily basis and a single, fully-loaded tank-container travels a distance of around 1200 km each week. In the process, data on acceleration forces under real conditions will be collected using sensors. According to information from the representative of CEFIC, this long term behaviour trial was also voluntary and went above and beyond the CSM requirements. Upon request, the representative of CEFIC explained that the new carrying wagons used by BASF were approved for hump shunting and that this work package would also investigate the spigots in terms of any modifications.

17. The final report should be available by the end of July 2019 and would present the effects of the technical changes and a scientific comparison between the new system (BTC on innovative 5L carrying wagons), the conventional system of carriage using tank-wagons and the current intermodal system with conventional tank-containers and carrying wagons.

18. Proposals to amend the provisions could then be drafted on the basis of the report, e.g.:

   – Construction of tanks (e.g. wall thicknesses prescribed for the various systems),
   – Reduce the minimum required unladen weight to 4 tonnes per axle, even when disc brakes are used,
   – Marking of carrying wagons fitted with reinforced spigots,
   – Additional safety measures for very dangerous substances (e.g. increased distance between buffers and tanks),
   – Minimum and maximum degree of filling of tank-containers in rail transport.

19. In relation to potential proposals concerning the degree of filling of tank-containers only carried in rail transport, the representative of CEFIC explained that loaded BTC in road transport were only carried on automotive vehicles (AGV) and that these AGV would travel on a transponder lane (and would therefore be guided) and the speed would be adapted to the route travelled so as to avoid any dangerous surge movements.

20. In reply to a question from the representative of UIP, the representative of CEFIC explained that the impact tests would be carried out at speeds of between 10 and 36 km/h. The speed used would be determined after the simulations.

ITEM 3: Reducing the wall thickness of the shell (see reports OTIF/RID/CE/GTT/2018-A, paragraphs 13 to 19 and OTIF/RID/CE/GTP/2018/5, paragraphs 29 to 31)

21. The representative of CEFIC was of the view that the different wall thickness requirements that existed in RID for tank-wagons and tank-containers were also connected to the fixing of the tank on the chassis (fixed on permanently for tank-wagons, flexible fixing for tank-containers on carrying wagons). He explained that the construction of the BTC built by the two manufacturers also differed. The tank-containers built by Van Hool had a wall thickness of 3.4 mm with several reinforcement rings, whereas those built by Magyar had a wall thickness of 4.5 mm with fewer reinforcement rings. However, both tank-containers had the same volume, almost the same unladen weight and almost the same payload. As a result, it would be possible via the planned overriding tests to derive information on how reinforcement rings and the wall thickness behave in an accident.

22. He explained that the overriding tests planned in work package 5 would be carried out on both tank-container design types and also on tank-wagons with a wall thickness of 6 mm mild steel and intermodal carrying wagons with three 20 foot tank-containers. These tests were expected to provide findings on the different behaviours of the two design types of BTC.

23. Upon request, he explained that in the event of the overriding of buffers, only the ends of the tank, which had thicker walls, would be affected, but that, insofar as it was technically feasible, sensors would also record the stresses on the cylindrical part of the tank and deformations in the tank wall would be detected by the probable use of a 3D scanner.

24. The representative of Germany recalled that the third root formula in Chapter 6.8 favoured high-grade steel and wall thicknesses of less than 3 mm could be calculated. Therefore, in order to ensure the stability of the tank, minimum values had been introduced, although no scientific proof for these had been provided.

ITEM 4: Fixings for welded elements (see report OTIF/RID/CE/GTT/2018-A, paragraphs 23 and 24)

25. The Chairman recalled that in relation to the fixings for welded elements there were differences between the various transport modes. Before considering whether the provisions should be harmonised in this respect, the results of the tests should be awaited.

ITEM 5: Pressure resistance of closures on the shell (see reports OTIF/RID/CE/GTT/2018-A, paragraphs 26 to 28 and OTIF/RID/CE/GTP/2018/5, paragraph 32)

26. The working group agreed to await the results of the risk assessment, as the tests to be carried out also included surge movements.

ITEM 6: Vehicle technology issues

Design of spigots and marking of carrying wagons fitted with reinforced spigots (see report OTIF/RID/CE/GTT/2018-A, paragraphs 10 to 12)

27. With regard to the marking of carrying wagons fitted with reinforced spigots, the representative of CEFIC offered to draft possibilities for the marking, together with UIC, and to return to this issue with a proposal at a later stage.

Minimum distance between the headstock plane and the shell (see report OTIF/RID/CE/GTT/2018-A, paragraphs 20 to 22)

28. With regard to the minimum distance between the headstock plane and the shell, which was currently only prescribed for tank-wagons, the representative of CEFIC referred to the tests which compared the carriage of a 45' tank-container on a 45' carrying wagon and on a 52' carrying wagon. Further findings might emerge from these tests.

29. The representative of the United Kingdom asked what stresses the protective bars on the front of the extra-large tank-containers have to withstand and the representative of CEFIC replied that they were only used as protection against impacts when lifting the tank-container on and off. They were not designed as protection against collisions. However, the tests would examine how this protective bar behaves when the buffers override.

30. In reply to the concluding question from the Chairman as to whether there were any suggestions to improve the test programme being envisaged, the representative of ERA emphasised that the the risk assessment, in general, would have to satisfy the requirements of the Common Safety Method on Risk Evaluation and Assessment (CSM).

ITEM 7: Any other business

Informal documents: INF.1 (UIP)
INF.3 (UIP)

31. In his informal document INF.1, the representative of UIP returned to a discussion that had taken place at the 2nd session of the RID Committee of Experts' standing working group (Copenhagen, 18 to 22 November 2013). At that meeting, footnote 1 to 6.8.2.1.2 had been amended and it was laid down that in the context of testing and inspecting whether the tank-wagons can withstand the stresses that occur in rail transport under the maximum permissible load, the notified body must evaluate compliance with the provisions of RID in addition to the requirements of the TSI or UTP and must confirm this compliance by a relevant certificate.

32. In the report of the standing working group, it was noted in this respect "that with regard to assessing the strength of the tank-wagon, it must be ensured that the permissible stresses for the tank must be those according to RID (standard EN 14025) and not those according to standard EN 12663 referred to in the TSI".

33. This link between TSI/UTP and RID meant that when assessing the strength of the tank-wagon, the tank must also be taken into account. According to UIP, recalculating the tanks of tank-wagons in accordance with the methods of standard EN 12663, but with the characteristic values reduced by the safety coefficients according to standard EN 14025, would lead to an increase of around 40% in the wall thickness of current types of tank-wagons. None of the UIP undertakings had taken into account the procedure described in the report of the standing working group.

34. In informal document INF.3, the representative of UIP explained that a discussion held in Germany at national level had come to the conclusion that at the standing working group in November 2013, the consequences of this decision had perhaps not been sufficiently discussed. Although footnote 1 to 6.8.2.1.2 could remain as it was, the further specification in paragraph 74 of the report of the 2nd session of the standing working group should be withdrawn. It was also necessary to define the obligations of the notified bodies according to TSI/UTP in the RID approval procedure.

35. Following a lengthy discussion, the working group agreed that in the framework of the national working group referred to in informal document INF.3, Germany would carry out a fundamental analysis of the problem and submit a proposal to resolve the issue of how the approval procedure could be arranged in future. The results of this analysis would be submitted to the next session of the working group on tank and vehicle technology.

36. As the problem concerned the interface between the tank and the vehicle and cooperation between competent authorities according to RID and notified bodies according to TSI/UTP, the results should then be dealt with in the new Joint Coordinating Group of Experts – JCGE. In so doing, the approval provisions for vehicles according to the fourth railway package should also be taken into account.

37. The working group agreed to inform the RID Committee of Experts' standing working group (Krakow, 21 to 23 November 2018) of this discussion and to request that paragraph 74 of the report of the 2nd session of the RID Committee of Experts' standing working group (OTIF/RID/CE/GTT/2013-A) be withdrawn (see informal document INF.11 of the standing working group).

Annex I

Liste des participants
Teilnehmerliste
List of participants

I. États parties au RID/RID-Vertragsstaaten/RID Contracting States

Allemagne/Deutschland/Germany

Mr Helmut **Rein**
Mr Alfons **Hoffmann**
Mr Benjamin **Körner**
Mr Frank **Jochems**

Belgique/Belgien/Belgium

Ms Caroline **Bailleux**
Mr François **Pondant**
Mr Luc **Borstlap**
Mr Luc **Opsomer**

Finlande/Finnland/Finland

Mr Jouni **Karhunen**

France/Frankreich/France

Mr Patrick **Caillet**
Mr Robert **Stawinski**

Pays-Bas/Niederlande/Netherlands

Mr Arjan **Walsweer**

Pologne/Polen/Poland

Mr Henryk **Ognik**
Mr Tomasz **Wilk**
Mr Łukasz **Balcerak**
Mr Tomasz **Rurka**
Mr Maciej **Sofiński**
Ms Anna **Górka**
Ms Beata **Ślepowrońska**

Royaume-Uni/Vereinigtes Königreich/United Kingdom

Mr Arne **Bale** (Deputy Chairman/stellvertretender Vorsitzender/Vice-président)

Suisse/Schweiz/Switzerland

Mr Colin **Bonnet**

Turquie/Türkei/Turkey

Mr Mehmet Bülent **Özçelik**
Mr Öncü **Alper**
Mr Mustafa **Uz**

II. États non parties au RID/Nicht-RID-Vertragsstaaten/Non-RID Contracting States

Russia/Russie/Russland

Mr Ivan **Khilov**

III. Organisations internationales gouvernementales/ Internationale Regierungsorganisationen/International governmental organisations

Agence de l'Union européenne pour les chemins de fer/Eisenbahnagentur der Europäischen Union/European Union Agency for Railways(ERA)

Mr Emmanuel **Ruffin**

IV. Organisations internationales non gouvernementales Internationale Nichtregierungsorganisationen International non-governmental organisations

CEFIC

Mr Thorsten **Bieker**
Ms Irmhild **Saabel**
Mr Holger **Schmiers**
Mr Mario **Naumann**

UIC

Mr Jean-Georges **Heintz**

UIP

Mr Rainer **Kogelheide** (Président/Vorsitzender/Chairman)
Mr Oliver **Behrens**
Mr Stefan **Franke**
Mr Philippe **Laluc**

UIRR

Mr Onorato **Zanini**

UNIFE

Mr Tomasz **Szmidt**

V. Secrétariat/Sekretariat/Secretariat

Mr Jochen **Conrad**
Ms Katarina **Burkhard**

VI. Interprètes/Dolmetscher/Interpreters

Mr David **Ashman**