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ORGANISATION INTERGOUVERNEMENTALE POUR LES TRANSPORTS INTERNATIONAUX FERROVIAIRES

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TO THE GOVERNMENTS OF THE MEMBER STATES OF OTIF

Final report of the RID Committee of Experts working group on tank and vehicle technology (Duisburg-Wedau, 24 and 25 June 2004)

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1. At the invitation of Railion Germany AG and the Federal Ministry of Transport, Construction and Housing (BMVBW), the 5th meeting of the RID Committee of Experts working group on tank and vehicle technology was held in Duisburg-Wedau on 24 and 25 June 2004.

2. The following States took part in the discussions: Austria, Belgium, Czech Republic, France, Germany, Lithuania, Netherlands, Poland, Romania, Spain, Switzerland and the United Kingdom. The International Union of Railways (UIC) and the International Union of Private Wagons (UIP) were also represented.

Chairmen

3. As already decided at the first session, Mr. H.-J. Kellerhaus (Germany) chaired the meeting and Mr. A. Bale (United Kingdom) was vice-chairman.

Welcome

4. The Head of Railion Deutschland AG's Customer Service Centre **(KSZ)** in Duisburg, Mr. Küter, welcomed the working group participants and explained the work of the Customer Service Centre.

ITEM 4a): Status with regard to the standardization of energy absorption elements

5. The representative of UIC informed the meeting that a working group comprised of manufacturers of crash buffers and wagons, UIP and UIC had been meeting since January 2004 and had drafted proposals to amend UIC leaflet 573. The approval procedure in UIC's Technical Commission would provisionally be concluded in July 2004. The working group on tank and vehicle technology would be informed of amendments after the procedure had been concluded.

6. The representative of UIP pointed out that general safety requirements often brought with them major problems with regard to the details. For instance, the crash buffers were not supposed to be activated at impact speeds of up to 12 km/h. However, this requirement became problematical if the wagons were coupled closely and the impact occurred on a track curve. In future, it should be ensured that detailed discussion of the associated problems takes place before provisions are drafted.

7. The representative of Germany asked the meeting to consider that the representatives of UIP and UIC should bring such points of detail to the attention of the working group in good time.

8. The representative of France regretted that category A buffers would still be permitted. France would have preferred category C buffers in this respect.

9. The working group supported the inclusion of a reference to UIC leaflet 573 in RID. UIC was requested to send the new UIC leaflet to OTIF in order that it could be examined at the 41st session of the RID Committee of Experts in November 2004. If the UIC leaflet were adopted, a reference to it could already be included in the 2005 edition of RID by means of a corrigendum.

ITEM 2a): Use of derailment detectors in Switzerland

Document INF. CH 2

10. The representative of Switzerland introduced his document setting out all the information concerning the construction components used and experience to date with the use of mechanical-pneumatic derailment detectors. According to a statement issued by SBB, a train separated as a result of emergency braking initiated by a derailment detector behaved in exactly the same way as a train separated normally.

11. The representative of Belgium referred to incidents where trains were braked following a loss of pressure in the main brake pipe. Only at a late stage had it been possible to determine that the cause of this was related to falsely activated derailment detectors. In order to make it easier to locate these wagons, it had been suggested that detectors should be fitted with an acoustic signal. The representative of Switzerland considered that a fluorescent indicator was more suitable.

12. The representative of Spain was of the view that no satisfactory solution had yet been found for the unresolved matter of whether emergency braking should be allowed in tunnels. The representative of Switzerland replied that it was possibly safer to bring a train to a stop as quickly as possible, irrespective of where it was.

13. The representatives of Spain and UIP considered that the decision as to where the train stopped should be left up to the locomotive driver. The representative of UIC asked whether there were any provisions in the various States setting out how a locomotive driver was to react if he became aware of a derailment.

14. The representative of UIC supported the assertion in document INF. CH 2 that 80% of accidents where a large quantity of dangerous goods escaped were due to a derailment. However, the representative of UIP questioned this figure, as it did not include shunting movements. He also noted that for highly toxic goods, which are not as a rule carried in complete train-loads, there was no benefit, as it was not intended to fit all goods wagons with derailment detectors.

15. The representative of Germany pointed out that accidents that had occurred up to now demonstrated the need for measures to prevent derailments. For this reason, all systems which could offer more safety in the event of a derailment had to be considered. The working group should recommend to the RID Committee of Experts to prescribe at a particular time a system for detecting derailments and for reducing the consequences of accidents. In the meantime (around 4 to 6 years), the participants should have the opportunity of developing a system that met the requirements set out by the RID Committee of Experts. He said he was prepared to draft a document summarizing the most important points. **In this context, he asked the representative of UIC** to make available **minutes of the discussions on including derailment detectors in UIC leaflet 541-08**, in order that the conclusions could be incorporated into the document for the RID Committee of Experts. **The representative of UIC said he would try to obtain the relevant documents from the Sub-Committee on braking.**

16. As some questions concerned rail transport in general, the representative of France recommended checking whether other groups already existed that had dealt with the subject of derailment. The representative of Switzerland added that the people involved in the context of the interoperability directives (TSIs) should also be included.

17. In conclusion, the Chairman summarized the discussion as follows:

    – There was a consensus that derailment detectors can reduce the effects of an accident.

    – Up to now, three systems were known about (mechanical-pneumatic, signal transmission via a pressure impulse process, signal transmission via train bus).

    – Unresolved points were whether the derailment detector should function automatically or by involvement on the part of the locomotive driver and how the motional stability of the train performed when a derailment detector was activated.

    – The outcome of discussions thus far in the context of UIC and the TSIs should be incorporated into a document for the RID Committee of Experts.

ITEM 3a): Protective measures to prevent damage caused by the overriding of buffers

Document INF. CH 1

18. The representative of Switzerland introduced his document prepared in conjunction with the representatives of Germany and UIP and in connection with this, emphasized the great importance attached to the subject of the transport of chlorine in Switzerland at the moment. The document took up the wording of the text adopted in square brackets at the 40th session of the RID Committee of Experts, but with the stricter provision that for certain very toxic gases, if the option of increasing the wall thickness of the tank ends was chosen, this wall thickness had to be 18 mm instead of 12 mm.

19. The representative of UIP stressed that he still preferred the decision of the 40th session of the RID Committee of Experts. Moreover, in the case of very toxic gases, better energy absorption could be achieved by having a wall thickness of 12 mm and a protective shield of 6 mm. **However, he considered increasing the wall thickness to 18 mm to be reasonable if this were deemed necessary for particularly dangerous gases as a result of country-specific risk assessments (political approach in respect of safety).**

20. The representative of the Netherlands proposed including in the provision the threshold value of 400 ml/m^3 for particularly dangerous gases, so that new gases would also come under this special provision.

21. The representative **of France** thought that increasing the wall thickness to 18 mm would lead to stresses in accidents that did not occur when smaller wall thicknesses were used.

Document INF. F 1

22. The representative of France introduced the calculations for a simulated frontal collision between two wagon sets, as set out in his document. Based on the results of these simulation calculations, he proposed arresting devices as active protection against the overriding of buffers.

23. The representative of Germany reminded the meeting that the working group had already assessed devices to protect against the overriding of buffers positively, but had also recognized that there were problems of compatibility. Systems already fitted on a single wagon had to produce an increase in safety. He suggested that the text proposed by France be adopted in square brackets, but it would have to be supplemented with respect to the question of the compatibility of different devices. A UIC study on the design of arresting devices would be desirable. This proposal was adopted, with two abstentions.

24. The representative of France explained that he had deleted the option of having sandwich covers on the tank ends, because a value of 22 kJ was not sufficient to absorb the amounts of energy that could arise. The residual energy in the simulation calculation had measured 2.4 MJ.

25. The representative of Germany replied that the value of 22 kJ was a specific energy absorption capacity corresponding to a wall thickness of 6 mm.

26. The representative of France would reconsider the question of sandwich covers.

27. Lastly, the representative of France introduced his third amendment proposal, which prescribed an arresting device for climbing buffers for the protective shield in every case. This arresting device would be limited in height in order to prevent it becoming ineffective if the protective shield bent over.

28. The representative of UIP was not in favour of limiting the height of the arresting device.

29. In a vote, four States voted for the Swiss proposal, four States voted for the French proposal, three States abstained. It was therefore agreed that the authors would submit both their proposals to the RID Committee of Experts, taking into account the arguments brought forward.

30. The representative of Belgium referred to the accident reports he had submitted in INF. B 1 and B 2, which showed very clearly the effects of buffers overriding and the need for protection against the overriding of buffers.

31. The representative of UIP reminded the meeting that the tank wagons concerned by this decision had also to be fitted with energy absorption elements at the same time. In order that the overall design of the tank wagons involved could be adapted in good time, it was absolutely vital that a decision be taken at the November session of the RID Committee of Experts.

32. There was a subsequent discussion on the possibility of retrofitting old wagons. The representatives of France and Switzerland were requested to deal with this issue in their documents for the RID Committee of Experts.

33. With regard to adding UN 1749 chlorine trifluoride to the list of gases for which a wall thickness of 18 mm is prescribed for the tank ends in the proposal in INF. CH 1, it was unanimously decided to delete the square brackets for the time being, for systematic reasons.

34. The representative of UIC referred to the particular risks of this substance. He was asked to check with CEFIC and EIGA whether there was still any need to carry UN 1749 in RID/ADR tanks at all, and if necessary, to submit a proposal to the RID/ADR Joint Meeting concerning the prohibition of carrying it in tanks. If necessary, UN numbers 2189 and 2901 could also be considered, as they were not permitted for carriage in portable tanks either.

ITEM 3b):Sandwich covers for tank ends

Document INF. NL 2 from the last meeting

35. The representative of the Netherlands introduced his document, which referred to **other protective aims** of the sandwich cover in addition to mechanical protection against penetration. **Thermal protection of tanks for certain liquefied gases, such as LPG, against exposure to fire, prolongs the time until the tank bursts and hence the time available to fight the fire.** If **certain liquefied** gases were carried in a refrigerated state, the quantity that escaped in the event of a tank being penetrated could be reduced considerably.

36. As this protective aim also concerned road transport, the representative of the Netherlands was asked to submit a document on this matter to the Joint Meeting's working group on tanks.

ITEM 3c): External/central solebars/self-supporting tanks

37. Various delegations went into the advantages and disadvantages of the different types of construction.

38. The representative of France referred to his document INF. F 1 submitted to the last meeting, which explained the disadvantages of central solebars and the advantages of the external solebars used in France.

39. The representative of UIC said he would also like the performance of solebars in accidents to be taken into account. He pointed out that the accident that occurred in Himberg (Austria) on 23 December 2003, which the representative of Austria had reported on at this meeting, had involved Romanian wagons with central solebars. It should be examined how damage to the filling and discharge devices could be avoided.

40. The representative of the United Kingdom referred to document INF. AAR 2, which said that in the US, wagons with central solebars had been used up to 1950, and after that, self-supporting tanks had been used. The United Kingdom's experience with the type of construction without external solebars had also been positive.

41. **The Chairman noted that the working group was not making any progress in its present discussions. A research project would be necessary as the basis for further discussions. Such a research project should investigate the 3 types of construction. This was necessary because up to now, suitable calculation procedures only existed for subparts, enabling certain assessments to be made. Such a research project should look particularly at accident performance (including with regard to the filling and discharge devices). It was agreed to leave this subject for the time being until appropriate research funds/research procedures could be floated.**

ITEM 3d) : Checklist

42**a**. The representative of Germany explained that the new staff training provisions **(Chapter 1.3)** would enter into force on 1 January 2005 and that for this reason, Germany would not continue to follow up the subject of checklists **for the time being.**

42b. The representative of UIC referred to the provisions of UIC leaflet 453 on carrying out brake tests and to the rules of Annex XII to RIV 2000 concerning technical checks on goods wagons, which were referred to in Chapter 1.3. In UIC's view, these rules were sufficient.

ITEM 3e): Air brake check

43. The Chairman described a proposal from Professor Hecht (Technical University of Berlin), in which the passage through the main brake pipe could be checked by means of chronometric measurement of the pressure reduction.

44. Because of the different wagon design types, the representative of UIC considered that it was not technically possible to obtain a reliable result using chronometric measurement. **On the other hand, the carrying out of brake tests was described in UIC leaflet 453.**

45. It was agreed to remove this item of the agenda until new technical possibilities became available.

ITEM 3f): Guard distance between the tank end and buffer beams

46. The Chairman noted that the 300 mm guard distance was already covered in UIC leaflet **573**. **In addition, a longer front end did not by itself make a substantial contribution to energy absorption in an accident,** so this item of the agenda could be concluded.

ITEM 4d):Safety in rail tunnels

47. The deputy Chairman of the multidisciplinary working group on safety in rail tunnels, Mr. Bieger, reminded the meeting that there were three significant documents for safety in rail tunnels:

- UIC leaflet 779-9, which contains recommendations from the railways, although these do not replace the existing national provisions;

- document TRANS/AC.9/9, which contained both recommendations and standards set down by the railways, ministries and inspection authorities;

– the Interoperability Directive on safety in rail tunnels, **which would be ready next year, and** which was to be mandatory in all the EU Member States.

48. In Mr. Bieger's view, the same safety concept can be discerned in all three documents:

– with regard to infrastructure, the question arises as to whether single track tunnels should be built from the outset. In tunnels, drainage must be provided to avoid dangerous substances leaking into watercourses or sewage systems;

– it is planned to use derailment detectors for rolling stock:

– with regard to operations measures, the question arises as to whether there should be a prohibition on meeting dangerous goods trains in tunnels. Before carriage, the infrastructure operator should be given information on the dangerous goods train. On the other hand, it is not considered useful to give advance notification of dangerous goods to the competent authorities and fire brigades. This should be a matter for individual States.

49. **The representative of Belgium pointed to a contradiction in UIC leaflet 779-9, in which a "derailment indicator" and an "emergency braking override" were recommended, which was not however possible with present derailment detectors. Mr. Bieger explained** that a distinction should be made between goods trains and passenger trains. While it was considered possible for goods trains to come to a halt in tunnels, for passenger trains, it must be ensured that emergency braking could be overridden.

50. The RID Committee of Experts would be informed that the measures concerning the dangerous goods area could be accepted. With regard to using derailment detectors, the result of the ongoing discussion (see ITEM 2a)) should be awaited.

ITEM 4c): Assessment of the documents from the Association of American Railroads (AAR)

51. The representative of Germany explained that Germany was translating the AAR documents into German and would send them to those taking part in the working group.

52. This item of the agenda would only be dealt with once the translation work had been completed.

ITEM 2b):Telematics

53. **Mr. Feuser and Mr. Köferstein of Railion Deutschland AG's Customer Service Centre** gave a presentation on the use of telematics systems for monitoring transmissions (see Annex to the report – "Quality management in rail-bound goods traffic" (only available in German)).

54. The representative of Germany gave a report on how matters stood with regard to the Telematics Research Project and referred to his document INF. D 2 from the last meeting of the working group, in which the advanced programme was set out. With regard to the use of telematics for security purposes (new Chapter 1.10 of RID/ADR), he explained that in Germany, there were developments on this **which originated from the military sector.** He asked whether **the representatives of other States had also received requests** to use these telematics systems for security purposes. **The other States said this had not been the case.**

55. The representative of UIC provided information concerning a UIC project on the behaviour of wheelset roller bearings. He explained that requirements for wheelset roller bearings were to be set out in a specifications handbook, which should then lead to a reduction in hot boxes.

56. This item of the agenda would be taken up again when telematics applications and technical solutions for providing information to the locomotive driver were available in practice.

ITEM 4b): Tank wagon handbook

57. The representative of UIC explained that he had received numerous documents, so the work could be started. The chemicals industry had expressed great interest in a handbook.

ITEM 4e): Any other business

Document INF. NL 2

58. The representative of the Netherlands introduced his document setting out approaches for solutions to avoid frequently occurring drip leaks. As these faults were particularly noted in the rail sector, he proposed that the subject should first be dealt with in the working group on tank and vehicle technology and should then be taken to the Joint Meeting's working group on tanks.

59. The representative of UIP explained that mistakes on the part of the carrier's or filler's staff should not lead to additional technical measures.

60. The representative of UIC recalled the provisions in RID for filling tank wagons for gases, which had lead to an improvement in safety. For this reason, he also considered provisions for filling and discharging tank wagons **for liquids** to be useful. He referred to his document OC-TI/RID/GT-III/2004/16 (TRANS/WP.15/AC.1/2004/16) submitted to the Joint Meeting, which dealt with the same problems as document INF. NL 2.

61. It was agreed to await discussion of document 2004/16 at the Joint Meeting. **The representative of the Netherlands would introduce the problems discussed in INF. NL 2 to the Joint Meeting.**

62. Documents INF. NL 1 and B 3 were deferred to the next meeting.

63. The Chairman announced that for professional reasons, he would no longer be in a position to chair the working group on tank and vehicle technology after the next meeting (spring 2005).

64. He thanked the Customer Service Centre for the meeting arrangements.

Annex 1

LIST OF PARTICIPANTS

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