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 **25 September 2013**

Report of the Working Group on Tanks

1. The Working Group on Tanks met from 23 to 25 September 2013 in Geneva on the basis of an appropriate mandate from the RID/ADR/ADN Joint Meeting, under the chairmanship of Mr. Arne Bale (United Kingdom) and with Mr. Michaël Bogaert (Belgium) 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 26 experts from 12 countries and 5 non-governmental organizations, dealt with the following official and informal documents in order:

Documents: ECE/TRANS/WP.15/AC.1/2013/36 (France)
ECE/TRANS/WP.15/AC.1/2013/38 (France)
ECE/TRANS/WP.15/AC.1/2013/39 (ECFD)
ECE/TRANS/WP.15/AC.1/2013/41 (AEGPL)
ECE/TRANS/WP.15/AC.1/2013/48 (UIP)

Informal documents:INF.20 (Belgium)
INF.29 (Netherlands)
INF.30 (Netherlands)
INF.37 (Norway)
INF.40 (Denmark)
INF.41 (UIP)
INF.56 (EIGA)

Item 1: ECE/TRANS/WP.15/AC.1/2013/36 (France) – Vacuum-operated waste tanks

3. The Working Group considered the proposal in detail and was assisted in its discussion by a presentation on national practice given by the German manufacturers for vacuum operated waste tanks. It was highlighted that the provisions of 6.10.3.8 also appear in 6.8.2.2.3 and both paragraphs were amended during the last session of the group. Three safety options were identified for operation of Chapter 6.10 tanks for flammable liquids: use of a water-ring pump or an ATEX pump, use of flame arresters or use of an explosion pressure shock resistant tank. The possible risks of all options were considered and it was clarified that the use of flame arresters does not prevent all risks (often demounted to avoid clogging, detachment of metal piece within the tank,…), nor does the use of explosion pressure shock resistant tanks. In this latter case, specifically during start of filling and end of discharge (when the tank and discharge hose are not filled with liquid) there is a risk of propagation of explosion. These could however possibly be addressed by operational provisions (e.g. creating vacuum inside the tank and shutting of the pump to initiate suction, use of inert gases,…).

4. The representative from Germany agreed to develop a proposal for the next session based on the possible way forward contained in the presentation, which is to include operational provisions when a pressure shock resistant tank is used for flammable liquids. The presentation given is annexed to this report.

Item 2: ECE/TRANS/WP.15/AC.1/2013/38 (France) – Tanks for the carriage of liquefied natural gas (LNG)

5. The Working Group supported the interpretation made by France in document 2013/38 that currently only vacuum insulated tanks shall be constructed for LNG in accordance with the standards referenced in 6.8.2.6 of ADR. The group confirmed that UN 1972 is referenced in part 1 of EN 13530, but is not referenced in part 1 of EN 14398. It was also clarified that tanks without vacuum insulation which predate the mandatory entry into force of these relevant standards still exist and are covered through a transitional measure.

6. Further analysis showed that currently part 2 of the standard EN 14398 is listed in 6.8.2.6.1, and table 1 of this standard is excluded. For the scope of standard EN 14398-2, reference is made to part 1 of the same standard, which contains the applicable substances in its Table 1. However, table 1 of part 2 of the standard deals with roundness of the tank and the group did not understand why this part of the standard was excluded. It was decided to raise this issue with the Working Group on Standards at their next session and depending on the outcome propose an amendment to clarify the issue to WP.15 (standard only referenced in ADR).

Proposal

7. Confirm the interpretation of the WG on Tanks that tanks for the transport of LNG, built after the mandatory entry into force of the standards in the regulations, need to be vacuum insulated, through a mention in the report of the Joint Meeting.

Item 3: ECE/TRANS/WP.15/AC.1/2013/39 (ECFD) – Additive devices on tanks

8. The Working Group re-examined the text proposed by ECFD and in particular the additions and changes included after the comments expressed by WP.15 and several delegations. Ultimately, an extensive redrafting and simplification of text was achieved, including modifications on:

- the continued use of existing additive devices through competent authority approval – similar to the current provisions for MEMU's,
- a clarification of the wall thickness of the means of containment in case of double walls – similar to double walled tanks,
- deletion of the requirement to include existing additive devices in the type approvals of the tanks as this is adequately covered by the new 6.8.2.3.4,
- deletion of the requirement for marking and labelling of the means of containment,
- the change of 0,3 bar to 0,2 bar for the leakproofness test – similar to the leakproofness requirements for tanks.

9. The group supported the redrafted text and proposed to submit it for endorsement to the Joint Meeting and for adoption by WP.15 (ADR only). The proposed text is reproduced below, extensive redrafting and changing of order of paragraphs did not allow for text in track changes.

Proposal

10. Amend the end of paragraph (a) of the definition of "Service equipment" in 1.2.1 to read:

"… heating, heat insulating and additive devices and measuring instruments;".

11. Add the following new transitional provision in 1.6.3:

"1.6.3.x Fixed tanks (tank-vehicles) and demountable tanks intended for the carriage of UN Nos. 1202, 1203, 1223, 3475 and aviation fuel classified under UN Nos. 1268 or 1863, equipped with additive devices designed and constructed before 1 July 2015 in accordance with the provisions of national law, but which do not, however, conform to the construction and approval requirements of special provision XYZ applicable as from 1 January 2015, may continue to be used with the approval of the competent authorities in the countries of use. "

12. Add "XYZ" in column (6) of Table A of Chapter 3.2 for UN Nos. 1202, 1203, 1223, 1268, 1863 and 3475.

13. Add a new special provision XYZ to section 3.3.1 as follows:

"**XYZ** When substances under this entry are carried in fixed tanks (tank-vehicles) or demountable tanks, these tanks may be equipped with additive devices.

Additive devices:

– are part of the service equipment for dispensing additives of UN 1202, UN 1993 packing group III, UN 3082 or non-dangerous goods during discharge of the tank,

– consist of elements such as connecting pipes and hoses, closing devices, pumps and dosing devices which are permanently connected to the emptying device of the tank's service equipment,

– include means of containment which are an integral part of the shell, or permanently fixed to the exterior of the tank or tank-vehicle.

Alternatively, additive devices may have connectors for connecting packagings. In this latter case, the packaging itself is not considered part of the additive device.

The following requirements shall apply depending on the configuration:

(a) Construction of the means of containment:

(i) As an integral part of the shell (e.g. a tank compartment), they shall meet the relevant provisions of Chapter 6.8.

(ii) When permanently fixed to the exterior of the tank or to the tank-vehicle, they are not subject to the construction provisions of ADR provided they comply with the following provisions:

They shall be made of a metallic material and comply with the following minimum wall thickness requirements:

Material	*Minimum wall thickness**
Austenitic stainless steels	2.5 mm
Other steels	3 mm
Aluminium alloys	4 mm
Pure aluminium of 99.80%	6 mm

** For means of containment made with double walls, the aggregate thickness of the outer metal wall and the inner metal wall shall correspond to the wall thickness prescribed.*

Welding shall be carried out in accordance with 6.8.2.1.23.

(iii) Packagings which are connectable to the additive device shall be metal packagings and meet the relevant construction requirements of Chapter 6.1, as applicable for the additive concerned.

(b) Tank approval

For tanks equipped or intended to be equipped with additive devices, where the additive device is not included in the original type approval of the tank, the provisions of 6.8.2.3.4 shall apply.

(c) Use of means of containment and additive devices

(i) In case of (a) (i) above, no additional requirements.

(ii) In case of (a) (ii) above, the total capacity of the means of containment shall not exceed 400 litres per vehicle.

(iii) In case of (a) (iii) above, 7.5.7.5 and 8.3.3 shall not apply. The packagings may only be connected to the additive device during discharge of the tank. During carriage, the closures and connectors shall be closed so as to be leaktight.

(d) Testing for additive devices

The provisions of 6.8.2.4 shall apply to the additive device. However, in case of (a) (ii) above, at the time of the initial, intermediate or periodic inspection of the tank, the means of containment of the additive device shall only be subject to an external visual inspection and a leakproofness test. The leakproofness test shall be carried out at a test pressure of at least 0.2 bar.

NOTE: *For the packagings described in (a) (iii) above, the relevant provisions of ADR shall apply.*

(e) Transport document

Only the information required in accordance with 5.4.1.1.1 (a) to (d) need be added to the transport document for the additive concerned. The following shall also be entered in the transport document: “Special Provision XYZ”.

(f) Training of the vehicle crew

The additives carried do not require separate training of the vehicle crew in accordance with section 8.2.1.

(g) Placarding or marking

Placarding or marking of the fixed tank (tank-vehicle) or demountable tank for the carriage of substances under this entry in accordance with Chapter 5.3 is not affected by the presence of an additive device or the additives contained therein.

14. The existing NOTE under the heading of Chapter 6.8 becomes NOTE 1. Add a new NOTE 2 as follows:

*"**NOTE 2:** For fixed tanks (tank-vehicles) and demountable tanks with additive devices, see special provision XYZ."*

Item 4: ECE/TRANS/WP.15/AC.1/2013/41 (AEGPL) – Periodic inspection of LPG tank-vehicles

15. The Working Group discussed the AEGPL proposal in detail, which was supported in principle by the majority of the group. Several experts were of the opinion that non-destructive testing (NDT) methods can find certain defects not normally detected by a hydraulic pressure test and that they may be used as an alternative to this test. However, some experts saw these methods as complementary to the existing tests rather than as a replacement because the NDT methods did not test the tank resistance as a whole. A discussion to widen the scope of the proposed alternative testing method to other substances or tanks (e.g. tank-wagons, …) led to a majority view that it would be best to start with the specific case of LPG in carbon steel tank-vehicles as for this case the industry possessed sufficient experience and the relevant standards (e.g. EN 12493) were developed. At a later stage, the extension to other gases and tanks should be considered. The expertise from other industry branches (e.g. industrial gases, static pressure vessels,…) could add value to the work in general.

16. There was a consensus that the current proposal required further work to address at least the following issues:

- What are the types of defects that are identified through the different NDT methods? The mentioned NDT methods are not equivalent in identifying the same types of defects (e.g. corrosion, erosion, fatigue cracks, welding defects,…).
- What level of skill is required for these methods (see TT8) – who will be competent to perform such testing?
- Which NDT methods may be used for which inspections (e.g. is acoustic emission also allowed, …)?
- How is the strength of manhole covers, bolt connections and flanges evaluated?
- Are NDT methods also to be used on the piping of the tank,…?
- The reference to standards should be dated (e.g. EN 12493:2008 + A1:2012).

17. The Working Group endorsed the work in principle and invited AEGPL to take the feedback from the discussion into account and come back with a revised proposal at the next session.

Item 5: ECE/TRANS/WP.15/AC.1/2013/48 (UIP) – Harmonization of inspection and approval procedures for tanks of Class 2 and tanks for the carriage of substances of Classes 3 to 9 + INF.40 (Denmark) + INF.41 (UIP)

Note: translational differences were noted between the English and French and German language versions of document 2013/48. Discussion took place based on the proposal in the English language version.

18. The Working Group recognised the large amount of work UIP had put into the proposal and expressed its support in principle for the framework of this approach to align the procedures for tanks for other classes of substances with those for tanks for Class 2 substances but felt that it was premature at this stage. Some delegations expressed that current national requirements or accreditation schemes for inspection bodies which deal with tanks for other classes than Class 2 were not in line with the proposal.

19. The main principle discussion revolved around the proposed new 6.8.2.4.6, which would allow a competent authority or recognised body of one member state/contracting party to operate freely within every other member state/contracting party, while remaining under the responsibility of the authority issuing the type approval. This would eliminate the principle of territoriality for all RID/ADR tanks. This principle is already partially recognized in RID, which contains provisions for approved national experts who can operate in other countries, contrary to ADR.

20. The working group expressed its concern that the principles of the TPED Directive 2010/35/EU, applicable within the EU, cannot be readily applied to tanks for other classes than Class 2 within an RID/ADR context because no over-arching administrative structure or rules on market surveillance exist which encompass all of the member states/contracting parties. Some experts considered that RID/ADR exists to facilitate international transport and issues related to placing on the market are outside their scope. Some felt that this issue should be first addressed at the level of the European Commission to see if the scope of the current TPED or TDG directive could be broadened, or a new directive could be envisaged.

Proposal

21. The Working Group invites the Joint Meeting to have a principle discussion on this subject first in order to give a clear indication to UIP and the Working Group on how to proceed with this work.

Item 6: ECE/TRANS/WP.15/AC.1/INF.20 (Belgium) – Degree of filling for environmentally hazardous substances – modification to 4.3.2.2.1

22. The Working Group considered the proposal by Belgium and recognised that indeed provisions were missing which deal both with the degree of filling for environmentally hazardous liquids (UN 3082) and with substances which are environmentally hazardous as a subsidiary hazard. It was confirmed that the proposed wording would ensure that flammable substances which only have environmentally hazardous as a subsidiary hazard

would retain their current degree of filling and that UN 3082 would be treated in the same way. After a discussion, the group agreed to add an editorial amendment in c) and propose the text to the Joint Meeting for adoption.

Proposal

23. Modify 4.3.2.2.1 as follows (new text underlined):

4.3.2.2.1 The following degrees of filling shall not be exceeded in tanks intended for the carriage of liquids at ambient temperatures:

(a) for flammable **and/or environmentally hazardous** substances without additional risks (e.g. toxicity or corrosivity), in tanks with a breather device or with safety valves (even where preceded by a bursting disc):

$$\text{Degree of filling} = \frac{100}{1 + \alpha\,(50 - t_F)}\ \%\ \text{of capacity}$$

(b) for toxic or corrosive substances (whether flammable **and/or environmentally hazardous** or not) in tanks with a breather device or with safety valves (even where preceded by a bursting disc):

$$\text{Degree of filling} = \frac{98}{1 + \alpha\,(50 - t_F)}\ \%\ \text{of capacity}$$

(c) for flammable **and/or environmentally hazardous** substances and for slightly toxic or corrosive substances (whether flammable ***and/or environmentally hazardous*** or not) in hermetically closed tanks without a safety device:

$$\text{Degree of filling} = \frac{97}{1 + \alpha\,(50 - t_F)}\ \%\ \text{of capacity}$$

(d) for highly toxic, toxic, highly corrosive or corrosive substances (whether flammable **and/or environmentally hazardous** or not) in hermetically closed tanks without a safety device:

$$\text{Degree of filling} = \frac{95}{1 + \alpha\,(50 - t_F)}\ \%\ \text{of capacity}$$

Item 7: ECE/TRANS/WP.15/AC.1/INF.29 (Netherlands) – Interpretation of the use of dry break couplings in relation to 6.8.2.2.2

24. The Working Group considered the document from the Netherlands and recalled that in the past a positive advice had been given on the use of dry break couplings based on a question raised by Austria. The group confirmed that the use of dry break couplings is acceptable from a technical point of view as a second or third closure in series in accordance with 6.8.2.2.2. The nature of this coupling is that the "male coupling" on the tank is always closed unless connected to a matching "female coupling" and hence the requirements of 6.8.2.2.2 were deemed to be complied with. It was pointed out that some of these couplings are approved according to EN 14432. The group recognized that there could be room to improve the current wording to take these kinds of couplings into account in more detail and invited interested parties to submit a proposal at a later session if they felt it necessary.

Item 8: ECE/TRANS/WP.15/AC.1/INF.30 (Netherlands) – The use of chemical resistant materials for shells of tanks with a protective lining

25. The Working Group considered the document presented by the Netherlands which contained details of an incident with an aluminium tank equipped with a protective lining. Several experts explained that they have national provisions in place which do not allow the use of aluminium as construction material for shells which are to be equipped with protective liners. It was recalled that specifically the provisions of 6.8.2.1.9 and 6.8.2.1.24 are very relevant. The group supported the initiative by the Netherlands to address the issue in detail in the regulations and several possible options were considered:

- a general provision excluding the use of aluminium, which is current practice in some countries
- a new TC provision or additional wording that the shell material must also offer a certain minimum resistance for certain substances
- a general performance requirement for shell materials
- additional provisions in line with TT2 for bromine

26. The expert from the Netherlands is invited to come back with a proposal for the next session, taking the feedback and proposed alternatives into account.

Item 9: ECE/TRANS/WP.15/AC.1/INF.56 (EIGA) – Holding times for the carriage of refrigerated liquefied gases

27. The Working Group recalled the two work items proposed at the previous session and thanked EIGA for the work done and the proposal in their late INF paper. The following items were addressed:

- An analysis of operational measures to avoid premature activation of the pressure relief device linked to guidance documentation developed by the industry for reference purposes.

- An evaluation of the calculation methods in the ISO 21014:2006 and EN 12213:1999 standards was carried out and it was concluded that they should offer an adequate method for determining the actual holding time.

The group endorsed the approach by EIGA but recognised that provisions for UN portable tanks should be discussed at the UN Subcommittee of Experts and proposed that an agreement should first be envisaged for RID/ADR tanks in Chapters 4.3 and 6.8. Some experts also enquired why the visual methods for determination of the holding time (graphical or with reference tables) no longer appeared in the proposal.

28. EIGA proposed to continue its work, including development of an EIGA guidance document, following the support from the Working Group and confirmed that they would come back with a proposal at the next session which takes the feedback from the group into account and invited written comments from interested parties.

Item 10: INF.37 (Norway) – Use of the entries UN 1965 and UN 1978 for LPG transported in tanks

29. The Working Group considered that the new definition for LPG implied that UN 1965 was the most appropriate entry to be used for the case described in INF.37. With regards to the differences in test pressure between UN 1978 (23 bar) and UN 1965 mixture C (27 bar), it was proposed that a way forward for Norway would be to issue a national regulation to allow 23 bar tanks for UN 1965 mixture C for national transport and to seek the option of a multilateral agreement for international transport with neighbouring countries. It was pointed out that also under the Directive 2008/68/EC Annex I, § 1.4, it was allowed for member states to maintain national provisions with regards to the reference temperature for the transport of liquefied gases.

Item 11: Tribute

30. The Working Group deeply regretted the demise of two esteemed experts since the last session. Mr. Paul Dehertefelt of the inspection body Apragaz had participated in the work of the group for many years as honoured member of the Belgian delegation. Ms. Arlette Seywert of CLCCR worked for more than 20 years on setting standards both within this group and with her colleagues all over Europe.

The group invites the Joint Meeting to pay tribute to their contribution over the years.