

Economic Commission for Europe

Inland Transport Committee

Working Party on the Transport of Dangerous Goods

21 March 2012

Joint Meeting of the RID Committee of Experts and the Working Party on the Transport of Dangerous Goods

Bern, 19–23 March 2012

Item 2 of the provisional agenda

Tanks

Report of the Working Group on Tanks

The Working Group on Tanks met from 19 to 21 March 2012 in Bern on the basis of an appropriate mandate from the RID/ADR/ADN Joint Meeting. The treated documents were submitted to the plenary session and remitted to the Working Group for analysis.

The Working Group on Tanks dealt with the following official and informal documents:

**1. 2012/1 (UIC) + INF.32 (EIGA) Comments on document 2012/1
Premature activation of safety valves in the carriage of refrigerated
liquefied gases in RID/ADR tanks; taking over the provisions for
portable tanks with respect to holding times and reference holding
times for RID/ADR tanks**

The Working Group based its discussion on INF.32 which amended the proposed text of 2012/1 and was accepted in the plenary session by UIC. The following questions were discussed in depth:

- Which methods exist currently and are deemed appropriate for the calculation of the actual and reference holding time?

The international standards EN 12213 and ISO 21014, the industry guideline document AIGA 072/11 and a graphic method were presented as methods to determine the reference holding time. The common ground for all the methods is a static holding time experiment where the tank is placed in controlled climatic conditions and the pressure increase in the tank is used to calculate the heat flux through the shell, which in turn allows a holding time determination. Such a test is currently commonly performed by the tank manufacturer at the moment of the initial type approval.

- Is competent authority approval for the use of such a method desirable/required?

For the moment no competent authority has officially recognized a standard or method, e.g. within the framework of ADR/RID 6.7. Belgium has taken initiative in September 2011, in close cooperation with EIGA, to develop such a method based on the standards and guidelines mentioned. The Working Group agreed that a commonly accepted method would be preferable and it would not be advisable to leave industry without a clear way of how they must comply with the regulation.

- How should deterioration of insulation be taken into account over the normal lifecycle of a tank?

Currently some industries use a general rule of thumb where a deterioration of 1 day of the actual holding time is assumed per year of service of the concerned tank. It was recognized by the working group that this is an estimate which has to deal with many uncertainties. Differences exist for example for foam insulated, vacuum insulated or shielded gas insulated tanks. It was proposed to invite industry to provide data to further fine-tune this rule of thumb.

- Should there be an evaluation of the insulation effectiveness with each periodic inspection?

In INF.32, EIGA proposed to add a requirement to evaluate the insulation effectiveness at every period inspection. However, the Working Group was not in favor of this proposal as it was felt that this would lead to very expensive testing protocols both for the notified bodies and for industry compared to the added value.

- Should the scope be limited to RID tank-wagons or also include tank-containers and tank-vehicles?

The Working Group agreed that not only RID tank-wagons were concerned but tank-containers should also be treated in the same way. As they typically have much shorter trips and attended by a driver it was not deemed necessary to extend the scope also to tank-vehicles for the moment.

The work done at the ADR/RID level in this area is deemed by the Working Group to be of direct relevance also for the 6.7 portable tanks and the Joint Meeting is invited to communicate this issue also at the UN level.

On the basis of this discussion, EIGA agreed to amend their document INF.32 and come back with a formal proposal for the next session.

2. 2012/2 (Germany) Chapter 6.10 Vacuum-operated tanks - Devices to prevent immediate passage of flame in pumps which may create sparks – alternative solutions

The proposal was supported in principle by the Working Group.

The Working Group treated the German document together with documents 2007/36 (Belgium) and INF.23 (Germany) from the September 2007 session of the Joint Meeting. In these documents two technical standard are mentioned: EN 14460 and TRT 006, which deal with testing and calculation methods to evaluate explosion shock resistance. One of the main differences between the two methods is that TRT 006 allows for higher permissible stresses in the shell. The Working Group felt that it should be stated clearly what is envisaged:

- explosion resistance in the sense of a resistance against expected explosion based on a peak pressure – EN 14460 could be suitable
- explosion resistance in the sense of the ability of a tank to survive an explosion incident – TRT 006 could be suitable

The Working Group proposed also to amend the English wording: e.g. “exhauster unit which may provide a source of ignition” instead of “a possible source of ignition”.

The expert from Germany concluded that he would prefer to come back with an updated proposal for the next session, taking into account the discussion in the Working Group.

Background information on TRT 006 would be provided along with the proposal, as also mentioned in §5 of the report of the Working Group in September 2007.

3. 2012/3 (Germany) Application of standards EN 14432 and EN 14433 listed in 6.8.2.6 +INF.18 (Germany); Type approval of accessories for tanks in accordance with Chapter 6.8 + INF.36 (Germany) Application of standards/recognized technical codes

2012/3

Document 2012/3 was considered together with the decision of the RID Expert Committee (Malmö, November 2011) and INF.14 from that session. It was highlighted that even though the Joint Meeting had rejected the proposed transitional measure in September 2011, the proposed measure was accepted for tank-wagons in the RID Expert Committee in the meantime. The Working Group reaffirmed that from a technical safety point of view there were no objections, as stated in the report of the Working Group of the September 2011 session. The Working Group agreed that the other concerns raised were also already stated in the same report of the September 2011 session and again referred this issue to the plenary session for final decision.

The sentiment was shared in the Working Group that this case should serve as an example of how not to deal with such problems in the future.

INF.18 + INF.18 rev1.

The Working Group discussed in detail the proposed INF.18. The following issues were raised by the experts:

- The type approval for cylinders and their service equipment is different from the procedure for tanks, which have a much larger number of equipments.
- For a separate conformity assessment of equipments, there should be a standard already available or it is unclear against which provisions the assessment would have to be carried out. The TPED directive currently already provides the option to have separate conformity assessments.
- It should be clear that the final responsibility lies with the body which gives the final tank approval.

In light of this discussion, the expert from Germany redrafted INF.18 and submitted INF.18 rev1 with the following proposed addition to 6.8.2.3.1:

“The prior conformity assessment of valves and other demountable equipment, having a direct safety function, may be carried out by the competent authority or a body designated by that authority, if the assessment can be effected according to standards listed in the table to 6.8.2.6.1. The prior conformity assessment has to be taken into account for the issuing of the certificate according to the first sentence, if the results of the test are presented and the valves and other equipment is fit for the intended use”

The text was checked for consistency and use of terminology by the Working Group. Ultimately, the Working Group proposes to insert the following text as a new paragraph at the end of 6.8.2.3.1:

“A competent authority or a body designated by that authority may carry out a separate type approval of valves and other service equipment for which a standard is listed in the table of 6.8.2.6.1, in accordance with that standard.”

The second sentence of the proposal of INF.18 rev1. was finally not deemed necessary as that issue is covered by the first paragraph of the actual 6.8.2.3.1, which already allowed the competent authority or its designated body which is responsible for the final tank approval to request test results for service equipments to verify conformity with the equipment requirements of 6.8.2.2. The term conformity assessment was replaced by type approval as it was understood by the Working Group that e.g. provisions for periodic evaluation of valves produced in series are usually taken up as a requirement in the type approval.

INF.36

During the initial discussion of this late informal paper in the Working Group, a number of experts were of the opinion that the current text of 6.8.2.7 would indicate that the competent authorities must in practice draw up recognized technical codes for every aspect not covered by the referenced standards. However, further careful consideration and discussion showed that the text of 6.8.2.7 was modified between 2007 and 2009 to prevent precisely this interpretation. Even though some experts expressed a wish to clarify the text editorially, it was ultimately clear for the Working Group that the wording of 6.8.2.7 imposes the following hierarchy:

- If a standard is listed, it must be followed
- If no standard is listed or an aspect is not covered by the standard or to reflect scientific progress, national competent authorities may recognize technical codes for those items, provided these codes meet the minimum requirements of 6.8.2
- If no standard is listed and no national code is recognized, tanks shall at least comply with the minimum requirements of 6.8.2

This prevents the unintended and never ending work of drafting new standards for every newly developed piece of equipment, which was agreed by the Working Group to be the interpretation and intent of the first paragraph of 6.8.2.7.

4. 2012/4 (Spain) Irregularities in the application of ADR, by some authorized bodies, under approval of the authority of a country Contracting Party to ADR and RID

The expert from Spain shortly presented several case studies which illustrated problems with improper use of materials compared to the material requirements in EN 14025 and EN 13445-2. Additionally, attention was drawn to some discrepancies which currently exist in the application of different technical codes and material standards. Several technical issues were confirmed during this presentation:

- T3 approval doesn't allow reduced wall thickness
- Structural steel according to EN 10025 is not an appropriate material for certain shells
- For construction of IMO4 tanks after 2011, the EN standard must be applied

The expert of Spain did not seek a more in depth study of the cases for the moment. For future reference, the Working Group expressed its willingness to discuss such actual cases when submitted and produce comments on a technical basis.

5. 2012/10 (Sweden) Limitation of volumes of fixed tanks (tank-vehicles) and tank-wagons

The Working Group discussed the Swedish paper in conjunction with the previous conclusions of the September 2009 session. It was made clear that the scope of the proposal was to limit the compartment volumes only for non-insulated low pressure tanks. The following points of consideration were discussed:

- Several experts questioned how the limit value of 15000 litres or any other value must be determined and the risk analysis behind it.
- Several experts repeated the comments made during the plenary introduction that more compartments would lead to more valves, more manipulations, additional costs, more journeys,... which would not necessarily benefit safety but have a significant economic impact. It was mentioned that the RID expert committee reached similar conclusions in 2002 on this issue.
- Some experts expressed that such high volumes would be in non-compliance with the maximum allowable weight on roads in many ADR/RID Member States.
- Some experts felt that the problem was predominantly for road transport as there are typically no low pressure tanks for rail and the minimum 6 mm wall thickness is followed.
- Alternative ideas to enhance safety of low pressure tanks were put forward for further consideration: e.g. only allowing reduction of wall thickness for tanks with compartments of a certain maximum size, additional protection or stiffening elements for larger compartments,... which could be proposed in the same sense of ADR/RID paragraph 6.8.2.1.5 but related to tanks:

“Tanks intended to contain certain dangerous substances shall be provided with additional protection. This may take the form of additional thickness of the shell (increased calculation pressure) determined in the light of the dangers inherent in the substances concerned or of a protective device (see the special provisions of 6.8.4).”

Ultimately, the Working Group proposed to have the Swedish proposal and the above mentioned items of consideration evaluated by WG 2 of CEN TC 296 in the scope of the construction standards of low pressure tanks (EN 13094) and revisit the issue at a later stage.

6. 2012/13 (Netherlands) Use of vacuum operated waste tanks (treated in sequence with 2012/2)

The Working Group treated the two questions raised in the Dutch document in sequence:

- (a) Is according to the current 4.5.1.1 the use of vacuum operated waste tanks restricted to waste?

Yes, the Working Group was of the opinion that currently the scope of vacuum operated waste tanks is limited to waste. The start of the second sentence was not perceived as

perfectly clear and it was proposed to clarify the second sentence of 4.5.1.1 using the waste definition in Chapter 1.2:

~~“Substances Waste~~ assigned to tank code...”

Additionally, the Working Group discussed the hierarchy of safety on a technical level between 6.8 and 6.10 tanks. Whereas 6.8 tanks have three mandatory closures in series and 6.10 tanks only two, the 6.10 tanks typically have a higher wall thickness and smaller diameter. It was not felt by the Working Group that 6.10 tanks were lower in safety hierarchy and there were no technical objections expressed against allowing pure substances transport in 6.10 tanks. The Working Group asked the plenary to consider this analysis and to evaluate allowing pure substances transport in 6.10 tanks if deemed appropriate. In this latter case, the first three words of the first paragraph of 4.5.1.1 can be deleted:

~~“Waste consisting of Substances...”~~

(a) Does the second sentence of 4.5.1.1 restrict the use of vacuum-operated waste tanks to substances assigned to tank code L4BH or another tank code permitted under 4.3.4.1.2?

No, a substance assigned to a different (higher) tank code is also allowed but in that case the three closures in series requirement must be complied with.

7. INF.22 (B) Informal working group on additive devices

The Working Group considered the report and proposed text from the informal working group which met in Bonn. In the proposed text several items were left between square brackets for consideration:

- In the proposed transitional measure it was unsure if the text for the additive devices would be incorporated in the 2013 or 2015 version of the regulations. The Working Group left it to the discretion of the plenary to decide on the urgency for adoption of text and the ability of the secretariats to handle such an extensive text so close to the end of this biennium.
- The construction requirements under SP XYZ (a) (ii) placed between square brackets were not deemed necessary by the Working Group. The Working Group proposed to delete the requirements for a breather device, a flame arrester, overfill protection, prevention of spillage in case of overturning and back-pressure effects.
- As an editorial remark it was mentioned that the references in paragraphs SP XYZ (b), (c) and (d) used the roman numerals in capital letters, which should be corrected.
- Prior to the discussion in the Working Group, the expert from Austria proposed to change the heading of the proposed SP XYZ (d) to read:
 - (d) Marking, **labeling** and placarding provisions for **the means of containment of** additive devices

The Working Group supported the adoption of the proposed text with the above mentioned editorial corrections taken into account.

8. 2012/15 (IRU) RID/ADR tanks and multimodal portable tanks for liquids

The Working Group carefully considered the document put forward by IRU, together with INF 22 (Belgium) of the September 2009 session, and would like to point out the following items which could already clarify some of the issues raised in both papers:

- During the restructuring of the regulations, when the ADR/RID incorporated also the UN portable tanks in what is currently chapter 6.7, the analysis was made of whether or not to retain a dual system or not. Based on technical differences, differences in origin of regulation and practical use issues the choice was made to maintain both systems parallel to each other. This decision was not disputed by the Working Group as both systems have their own value and typical application.
- A tank which is approved according to both systems and carries both markings on the tank must ensure that the marking corresponds at all time with the actual equipment present. For example a tank which is coded L4BH and T7 must be equipped with a bursting disc to fulfill the minimum requirements of both systems even though T7 does not demand a bursting disc. Paragraph 4.2.5.2.5 accommodates this situation.
- Alternatively, a tank which is coded L4BN and T7 of course need not have a bursting disc.
- Substance transport is authorized in a double coded tank as soon as the substance is authorized according to one of both systems. In the above example methanol can be transported in a L4BN/T7 double coded tank even when normally L4BH is required because of the T7 coding. In this case no bursting disc is required and filling occurs according to the Chapter 6.7 system.
- Both approval markings can be indicated on the same tank plate.
- On an individual substance basis, a revision proposal to bring the provisions for 6.8 tank-containers more in line with 6.7 portable tanks can always be considered by the Working Group.

9. 2012/16 (France) Sections 1.6.3 and 1.6.4: Transitional measures for tanks + INF.21 of the Joint Meeting in March 2011 (OTIF Secretariat) Review of transitional provisions

The Working Group evaluated the French document together with INF.21 from the OTIF secretariat of the March 2011 session. The following reservations and recommendations were made on the proposal and the issue in general:

- Referencing two sets of paragraphs in the same transitional measure leads to confusion and problems with the unique identification of provisions. Referencing “6.8.2.1.26 applicable as from January 1997” instead of the old marginals makes no sense as 6.8.2.1.26 did not exist in 1997.
- For reasons of clarity, the old marginals must be maintained in the transitional measures as they contain the only legal correct reference to older provisions. In many cases the texts of the old marginals and their “current successor” are not identical.
- In the proposed redraft of 1.6.3.6 the reference is made to 6.8.2.1.20 without the stipulation of which ADR/RID version should be considered. Referencing in such a way has the disadvantage that future changes to 6.8.2.1.20 become increasingly difficult to handle.

- The actual problem and need of both the sector and the competent authorities is availability of the old texts and could be handled in a different way. Two routes were put forward: either to ask the secretariats to digitalize all of the older texts (which the Working Group understood as an ongoing effort at UNECE level) or to ask the secretariat to write and publish a guidance list with the old marginals which are still mentioned in 1.6.3/4, the text of those marginals and an indication of where to find more actual provisions (including the ADR/RID version).
 - Example: 211 127 (5) (1990 version) | see 6.8.2.1.20 (2011 version) | “text of 211 127 (5)”
 - In this latter case the Working Group felt it advisable to include a note with the link to this document at the start of 1.6.3 and 1.6.4.
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