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## 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

Bern, 23-27 March 2015

Item 2 of the provisional agenda

##### Tanks

#### 4.3.2.2 – Degree of filling

##### Proposal transmitted by the secretariat of OTIF<sup>1, 2</sup>

###### *Summary*

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| <b>Executive summary:</b>  | Harmonisation of the provisions concerning the degree of filling of tank-containers in RID/ADR and SMGS Annex 2.   |
| <b>Action to be taken:</b> | Possibility of setting a lower or higher temperature for the maximum mean temperature of the load (tr) for carriage under moderate or extreme climatic conditions.                                     |
| <b>Related documents:</b>  | Informal document INF.3 from the fourth session of the RID Committee of Experts' standing working group;<br>Draft report of the fourth session of the standing working group [OTIF/RID/CE/GTP/2014-B]. |

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<sup>1</sup> In accordance with the programme of work of the Inland Transport Committee for 2014–2015 (ECE/TRANS/240, para. 100, ECE/TRANS/2014/23, cluster 9, para.9.2).

<sup>2</sup> Circulated by the Intergovernmental Organisation for International Carriage by Rail (OTIF) under the symbol OTIF/RID/RC/2015/3.

## Background

1. Following round table discussions on "The carriage of dangerous goods – global and regional dimensions" at the seventy-third session of the UNECE Inland Transport Committee (Geneva, 1 March 2011) (see also informal document INF.18 from the Joint Meeting in September 2011), the OTIF Secretariat started work in November 2011, together with the OSJD Committee, on harmonising RID and SMGS Annex 2 more closely.

2. In recent years, numerous railway-specific provisions in RID and SMGS Annex 2 have already been aligned with each other. Among other things, it can be deemed a success that, with a few exceptions, the provisions of Chapters 4.3 and 6.8 concerning the construction, equipment, approval, testing, marking and use of tank-containers in SMGS Annex 2 have been harmonised with the corresponding provisions of RID/ADR.

3. One of these exceptions concerns the formulae for calculating the degree of filling in 4.3.2.2.1; in RID, a fixed value of 50°C for the maximum mean temperature of the goods loaded is assumed. The OSJD Member States were of the view that this fixed value took no account of carriage performed under extreme climatic conditions.

4. The OTIF secretariat's report on the decisions of the OSJD Commission for Transport Law in the field of provisions for the carriage of dangerous goods (Warsaw, 27 to 31 October 2014) (see also informal document INF.3 from the fourth session of the RID Committee of Experts' standing working group (Madrid, 17 to 20 November 2014)) has the following to say:

"4.3.2.2 Degree of filling

18. The representatives of the OSJD Member States decided for the time being not to take over from RID the wording of 4.3.2.2.1 and 4.3.2.2.2 concerning the degree of filling. This was because in the formulae in RID for calculating the degree of filling, a fixed value of 50°C is used for the maximum average temperature of the goods loaded, instead of the variable  $t_r$ .

19. The representative of the Russian delegation pointed out that the wording of both paragraphs in RID did not take any account of carriage under extreme climatic conditions.

20. The RID Committee of Experts' standing working group is asked to consider whether, in calculating the degree of filling according to the example in Chapter 4.2, it would not be useful to use the variable  $t_r$  instead of a fixed value of 50°C, and subsequently to include a new paragraph saying that while the maximum average temperature of the goods loaded is indeed set at 50°C, for carriage under extreme climatic conditions, the competent authority may prescribe a lower or higher temperature. 4.2.1.9.4.1 of Chapter 4.2 already contains the same provision.

21. If the RID Committee of Experts' standing working group were to decide that this needs to be dealt with, this issue would have to be examined in the RID/ADR/ADN Joint Meeting's working group on tanks."

5. The RID Committee of Experts' standing working group discussed these problems and asked the OTIF Secretariat to draft a proposal for the working group on tanks at the next Joint Meeting (see following extract from the draft report of the fourth session of the standing working group [OTIF/RID/CE/GTP/2014-B]):

"4.3.2.2 Degree of filling

37. The Secretariat informed the working group of the decision taken by the OSJD Member States not to take over from RID for the time being the wording of 4.3.2.2.1 and 4.3.2.2.2 concerning the degree of filling.

38. The representative of Russia explained that the wording of both paragraphs in RID did not take any account of carriage under extreme climatic conditions. Instead of a fixed value of 50 °C for the maximum mean temperature of the goods loaded, he proposed that, following the example of the calculation formulae for portable tanks in Chapter 4.2, the variable  $t_r$  be used. While it was true that 4.2.1.9.4.1 of Chapter 4.2 set the maximum mean temperature of the goods loaded at 50 °C, for carriage under extreme climatic conditions, the competent authority could prescribe a lower or higher temperature.

39. In addition, the representative of Russia provided information about measurements carried out on 18 July 2014 in Russia (Siberia, Urals, Caucasus), Kazakhstan, Tajikistan, Kyrgyzstan and other central Asian countries which showed that the maximum mean temperature of the goods loaded was 36 °C. He pointed out that in Russia, the degree of filling was differentiated on the basis of the countries transited and the country of destination.

40. As some delegations said they wished to discuss this issue at the RID/ADR/ADN Joint Meeting as well, the Secretariat will prepare a suitable proposal for the working group on tanks. The working group on tanks should consider the question of which specifications concerning the maximum mean temperature of the goods loaded should be taken into account and try to make the wording of 4.2.1.9.4.1 of Chapter 4.2 clearer.

41. In view of past accidents caused by the overfilling of tanks, the Chairman and the representative of the Netherlands asked that extreme care be taken in the amendments to the provisions of 4.3.2.2."

## Proposal

6. Based on the above, the OTIF Secretariat requests the working group on tanks to examine whether the formulae in 4.3.2.2.1 (a) to (d) can be amended as follows:

4.3.2.2.1 Amend the formula in (a) to read as follows:

$$\text{"Degree of filling} = \frac{100}{1 + \alpha (t_r - t_f)} \text{ \% of capacity"}$$

Amend the formula in (b) to read as follows:

$$\text{"Degree of filling} = \frac{98}{1 + \alpha (t_r - t_f)} \text{ \% of capacity"}$$

Amend the formula in (c) to read as follows:

$$\text{"Degree of filling} = \frac{97}{1 + \alpha (t_r - t_f)} \text{ \% of capacity"}$$

Amend the formula in (d) to read as follows:

$$\text{"Degree of filling} = \frac{95}{1 + \alpha (t_r - t_f)} \text{ \% of capacity"}$$

4.3.2.2.2 Amend to read as follows (take over the wording of 4.2.1.9.4 and 4.2.1.9.4.1):

"4.3.2.2.2 In these formulae,  $\alpha$  is the mean coefficient of cubical expansion of the liquid between the mean temperature of the liquid during filling ( $t_f$ ) and the maximum mean bulk temperature during carriage ( $t_r$ ) (both in °C). For liquids carried under ambient conditions  $\alpha$  could be calculated by the formula:

$$\alpha = \frac{d_{15} - d_{50}}{35 d_{50}}$$

in which  $d_{15}$  and  $d_{50}$  are the densities of the liquid at 15 °C and 50 °C, respectively.

The maximum mean bulk temperature ( $t_r$ ) shall be taken as 50 °C except that, for journeys under temperate or extreme climatic conditions, the competent authorities concerned may agree to a lower or require a higher temperature, as appropriate."

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