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Item 2 of the provisional agenda
Tanks

Transport in tanks of UN 0133 (Explosive, Blasting, Type B)

Transmitted by the European Chemical Industry Council (CEFIC)[1, 2]

Background

1. This document concerns ANFO (Ammonium Nitrate – Fuel Oil) explosives as a mixture of prilled ammonium nitrate and oil, classified as UN 0331 Explosive, Blasting, Type B, Class 1 Division 1.5 D. They are transported to supply mines.

2. Based upon long-time operating experience and for safety reasons it is appropriate to charge and discharge tanks with enclosed pneumatic systems and therefore these tanks have to be designed. For technical reasons, an overpressure of more than 1 bar is needed for discharging. For all expected operating conditions, tanks with a testing pressure of 2.65 bar are suitable.

3. The transport of a substance classified as UN 0331 Explosive, Blasting, Type B, Division 1.5 D in portable tanks with instruction "T 1" has been permitted by ADR since 2005 and specifications for the vehicles have been determined (i.e. EX/III in column 14 of Table A). The suitability test for the transport of UN 0331 Explosives, Blasting, Type B in tanks has been successfully performed through deployment of the Modified Vented Pipe Test (Test 8 D 2) in accordance with Part 1 of the Testing Manual 18.7.2.

[1] In accordance with the programme of work of the Inland Transport Committee for 2010-2014 (ECE/TRANS/208, para 106, ECE/TRANS/2010/8, programme activity 02.7 (c)).

[2] Circulated by the Intergovernmental Organisation for International Carriage by Rail (OTIF) under the symbol OTIF/RID/RC/2011/45.

4. In the case of aluminium being used for the tank body the construction regulations for “portable tanks” in Paragraph 6.7.2.2.1 make provisions for insulation with a sheathing of thermally resistant material (e.g. steel), in order to protect the tank in the case of external fire. According to BAM (statements from 04.12.2005 and 05.01.2006) the additionally prescribed inclusion is unsuitable for land transport of UN 0331 Explosives, Blasting, Type B for safety reasons.

5. Applicable conditions for the transport of the named substances in ADR tanks, as determined by 6.8 are not covered by ADR 2011, therefore prohibiting transport at present.

6. In order to allow the carriage of UN 0331 Explosives, Blasting, Type B in ADR tanks corresponding to chapter 6.8, the assignment of a tank code in chapter 3.2, Table A is necessary.

Proposal

7. It is proposed to allow the transport of UN 0331 Explosives, Blasting, Type B, Class 1.5 in ADR tanks and therefore the following amendments are proposed:

For UN 0331 in Table A of Chapter 3.2:

- Insert in column 12: S2.65AN(+)
- Insert in column 13: TU 3, TU 12, TU 39, TU XX, TC YY, TA 1

8. Extension for usage described in section 4.3.2.1 and for the special provisions in section 4.3.4.1.3 concerning the usage of Class 1 (in particular Subclass 1.5) in tanks.

9. Therefore add a new (a) to 4.3.4.1.3 with the following text (re-numbering existing paragraphs (b) to (i):

"(a) Class 1.5
UN 0331 Explosive, Blasting, Type B: code [S2.65AN(+)]"

10. In Section 4.3.5 add a new special provision TU XX as follows:

“TU XX: The maximum permissible net mass in 7.5.5.2.1 is not applicable if in addition to the verification of suitability in accordance with TU39, the suitability of the substance in cases "without mass limitation" has been determined by the competent authority."

11. In Section 6.8.4 b) add a new a special provision TC YY as follows:

“TC YY: The shells shall be made of aluminium or aluminium alloy.”

Justification

12. The described system enabled by the proposed amendments is safe and will maintain the required high standard of safety, as demonstrated since many years in Germany, thanks to a national derogation. The isolation to ambient atmosphere and the transport in tanks offers a significantly higher level of security compared to the transport and handling of smaller containers.

13. In 2005, ADR permitted the transport of UN 0331 in portable tanks and this initiated a further significant improvement in the product quality. Tank transport largely avoids external influences which could negatively affect the product: particularly the entry of moisture into the tank. Furthermore, using a pneumatic plug-flow ensures that the product benefits from particularly smooth handling.

14. The reorganisation of the carriage system resulting in the use of trucks with tank containers based upon the German national derogation has enabled the quantity of explosive consignments to be significantly reduced, which, at the very least, contributes to an increase in safety as regards the

handling of potentially explosive substances. Current events add importance to this factor. This form of carriage has proven itself over several years from both the safety as well as the operational point of view and should therefore be continued in the future.

15. The explosive in question has been repeatedly (Dec. 2004, Oct. 2005 and Nov. 2007) tested with both steel and aluminium containers by BAM, using „Modified Vented Pipe Tests“ following the proposal UN/SCETDG/21/INF.69 from July 2002 and in accordance with Part 1 of the UN Manual of Tests and Criteria, 18.7. The agreed alterations performed for the test were conservative deviations such as the use of smaller outlet openings to simulate a higher/firmer inclusion. The suitability for transport in tanks was successfully proven in every test.

16. In none of these three tests did detonation occur following stress through external fire. In each case the explosives burned off completely; material was partially ejected from the model container. The aluminium model containers opened during the tests due to internal pressure and temperature influence.

17. BAM does not view the material emission as critical. The opening of the container is regarded as a further reduction of the inclusion and is thus in the case of fire a positive - even desirable - factor in terms of safety.