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Working Party on the Transport of Dangerous Goods

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Item 6 b) of the provisional agenda

**Proposals for amendments to Annexes A and B of ADR:
miscellaneous proposals**

Use of Liquefied Natural Gas (LNG), Compressed Natural Gas (CNG) and Liquefied Petroleum Gas (LPG) as fuel for vehicles carrying dangerous goods – upper capacity limits

Transmitted by the Government of Germany¹

¹ In accordance with the draft programme of work of the Inland Transport Committee for 2016-2017, (ECE/TRANS/WP.15/2015/19 (9.2)).

Summary

- Executive summary:** At its ninety-ninth session in November 2015, the Working Party adopted amendments to ADR allowing for the use of liquefied natural gas (LNG), compressed natural gas (CNG) and liquefied Petroleum Gas (LPG) as fuel for vehicles carrying dangerous goods. These provisions are to enter into force on 1 January 2017.
- No agreement could be reached as regards the unresolved issue of how to establish the required quantity limit. For this reason, the final discussion of this issue on the basis of an official proposal was postponed to the next session of the Working Party.
- In the light of the previous discussions within the Working Party, Germany therefore proposes a quantity limit – in analogy to the quantity limit in accordance with sub-section 1.1.3.3 (a) of ADR – equivalent to the quantity needed to drive as far with as would be possible with 1 500 litres of liquid fuel.
- Action to be taken:** Discuss and amend the provisions on the use of LNG, CNG and LPG as fuel for vehicles carrying dangerous goods and on the limitation of the capacity in sub-section 1.1.3.2 (a) of ADR 2017.
- Reference documents:** ECE/TRANS/WP.15/230, paragraphs 39 to 41 and Annex I, ECE/TRANS/WP.15/2015/16 (AEGPL and NGV Global), ECE/TRANS/WP.15/2015/17 (Germany), related informal documents: INF.15 and INF.23 (AEGPL and NGV Global), INF.24 (Secretariat)

Introduction

1. At the November 2015 session of the Working Party, Germany presented document ECE/TRANS/WP.15/2015/17 and suggested revising and harmonizing the exemption provisions in ADR 2017 concerning the use of liquefied natural gas (LNG), compressed natural gas (CNG) and liquefied Petroleum Gas (LPG) as fuel for vehicles carrying dangerous goods – in analogy to the applicable exemption provision for liquid fuels in 1.1.3.3 (a) of ADR. The Working Party generally followed the approach set out in the German proposal.
2. At the same session, AEGPL and NGV Global suggested in document ECE/TRANS/WP.15/2015/16 amending the provisions in Chapter 9.2 of ADR to make the use of CNG and LPG possible as fuel for vehicles carrying dangerous goods.
3. The discussion of the two proposals resulted in a new document that was made available by the secretariat during the session as informal document INF.24. There was a discussion on the basis of this INF.24, and in the end, the proposed wording was adopted with a few amendments as the new wording for ADR 2017.

4. No agreement could be reached as regards the unresolved issue of how to establish the required quantity limit.
5. Views were divided on the question of whether to have quantity limits for the application of the exemption of 1.1.3.2 a) and the values to give the maximum levels if appropriate. This point will be discussed on the basis of a formal proposal.
6. Germany is still concerned about the not yet existing upper capacity limits. In the light of the previous discussions within WP.15, Germany therefore proposes a quantity limit equivalent to the quantity needed to drive as far with as would be possible with 1,500 litres of liquid fuel.

Proposal

7. The following proposed amendments concerning the use of LNG, CNG and LPG as fuel for vehicles carrying dangerous goods are based on the new text of ADR 2017 as agreed in the November 2015 meeting (ninety-ninth session) set out in ECE/TRANS/WP.15/230 also taking into account the comments of the delegations made at that session.

Proposal 1

1.1.3.2 (a)

8. Subsection 1.1.3.2 (a) could be amended as follows (new text underlined):

“1.1.3.2 Exemptions related to the carriage of gases

The provisions laid down in ADR do not apply to the carriage of:

- "(a) Gases contained in the tanks or cylinders of a vehicle, performing a transport operation and destined for its propulsion or for the operation of any of its equipment used or intended for use during carriage (e.g. refrigerating equipment).

The gases may be carried in fixed tanks or cylinders, directly connected to the vehicle's engine and/or auxiliary equipment or transportable pressure receptacles, which comply with the pertinent legal provisions.

The total capacity of the fixed tanks shall not exceed the amount of energy (MJ) or mass (KG) corresponding to the fuel limits of 1.1.3.3 (a) ADR.

NOTE: For the energy content of fuel see European Directive 2009/33/EC, Promotion of Clean & Energy Efficient Road Transport Vehicles, Annex, Table 1.

Justification for proposal

Proposal 1

1.1.3.2 (a)

9. Considering the discussion on upper capacity limits in the recent session of the Working Party in November and in keeping with the philosophy of creating a harmonized and consistent regulatory approach to gaseous and liquid fuels for heavy goods vehicles carrying dangerous goods, the above quantity limits for the application of the exemption of

1.1.3.2 (a) will provide a level of safety sufficient to justify the use of LNG, CNG and LPG. Germany proposes to amend the wording in ADR 2017 accordingly.

10. However, the use cases that have become evident in the course of the discussions within the Working Party and are becoming increasingly important require the exemption to be clarified concerning the as yet non-existent upper capacity limits for gases.

11. The question of a quantity limitation for gases should be considered in the light of existing relevant scientific opinions in the field of automotive engineering.

12. It is proposed that a new NOTE will be added to provide some more information as for example:

On an energy basis the following would apply:

Directive 2009/33/EC of the European Parliament and of the Council of 23 April 2009 on the promotion of clean and energy-efficient road transport vehicles, Annex, *Table 1: Energy content of motor fuels*. Table 1 indicates energy content of fuels:

Diesel = 36 MJ/litre

Natural gas/biomethane (also for LNG) = 33-38 MJ/Nm³ average = 35.5 MJ/Nm³

LPG = 24 MJ/litre

For natural gas, with an average density of 0.7 kg/Nm³, this means: $35.5/0.7 = 50$ MJ/kg

1 500 litre of diesel means $1\ 500 \times 36 = 54\ 000$ MJ

For NG this means: $54\ 000 / 50 = 1\ 080$ kg

For LPG with an energy content of 24 MJ/litre

1 500 litre of diesel means $1\ 500 \times 36 = 54\ 000$ MJ

For LPG this means: $54\ 000 / 24 = 2\ 250$ litre