

Economic Commission for Europe

Inland Transport Committee

Working Party on the Transport of Dangerous Goods

9 February 2024

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

Bern, 25-28 March 2024

Item 5 (b) of the provisional agenda:

Proposals for amendments to RID/ADR/ADN:

New proposals

Use of intermediate bulk containers for higher concentrations of UN 2672 ammonia solution

Transmitted by the Government of the United Kingdom

I. Introduction

1. At the March 2023 session of the Joint Meeting the United Kingdom brought forward document ECE/TRANS/WP.15/AC.1/2023/18 in respect of the transport of ammonia in IBCs. The United Kingdom introduced this document because it had raised Multilateral Agreement (M345), expiring 1 February 2027, which has been countersigned, at the time of drafting this document, by Ireland, Italy, San Marino, and Slovakia. This agreement allows the continued carriage of ammonia in IBCs where the vapour pressure is greater than 110 kPa and confirms that any IBC listed in IBC03 may be used subject to an appropriate pressure test. The United Kingdom brought document ECE/TRANS/WP.15/AC.1/2023/18 to ensure the continued carriage beyond the current expiration date of M345. As a result of the comments given by other experts during the March 2023 session, the document was withdrawn to allow time for full consideration of these views. This document is a response to the comments received and is intended to provide sufficient explanation for those experts to reconsider their position.

2. Several experts considered that there was potentially an increased safety risk in warmer climates, with vapour pressures exceeding safe levels due to higher concentrations of ammonia. It was understood that there were concerns that the 50°C temperature was too low and would be insufficient to provide the necessary safety level. The United Kingdom notes these concerns but the regulations at 4.1.1.10, paragraph 1, already address this issue. It states, "Liquids shall be filled only into packagings, including IBCs, which have an appropriate resistance to the internal pressure that may develop under normal conditions of carriage. Packagings and IBCs marked with the hydraulic test pressure prescribed in 6.1.3.1 (d) and 6.5.2.2.1, respectively shall be filled only with a liquid having a vapour pressure..." it then gives three options, of which (b) is (vapour pressure) "...at 50°C less than four-sevenths of the sum of the marked test pressure plus 100 kPa".

3. The highest concentration of ammonia permitted under UN 2672 is 35 percent. In informal document INF. 21 of the September 2013 Joint Meeting,¹ Belgium included NH₃ vapour pressures for 25 percent and 35 percent concentrations at 50°C, these were 154 kPa and 325 kPa respectively. These are close to the figures that the United Kingdom has used

¹ Transport of ammonia solutions in IBCs.

for IBC tests in support of M345 (from published tables from the University of Illinois²) of 149 kPa and 315 kPa respectively and are necessary to determine the required test pressure for drums, jerrycans and IBCs.

4. Furthermore, ADR/RID do not address different climatic conditions for drums or jerrycans. Therefore, it is already possible for higher concentrate ammonia to be carried in such packagings and in warm climates providing that the appropriate pressure testing has been done according to 4.1.1.10. The only difference between a package and an IBC is that currently there is the general provision for the latter, in paragraph 2 of 4.1.1.10, preventing the carriage of substances with vapour pressures in excess of 110 kPa. The proposed addition of a new Special Provision 67X removes this obstacle from IBCs containing ammonia in concentrations up to 35 percent and reinforces the requirement that the IBC being used must be pressure tested at the appropriate level for the concentration of ammonia that it is intended to carry. In the United Kingdom, a test was done on a steel IBC at a test pressure of 460 kPa. This was calculated from the known vapour pressure of the highest concentration of ammonia (35 percent) permitted at 50°C and therefore includes the normal safety factors over and above the actual pressure that would be generated at 50°C. In addition, the ADR tank code for ammonia is L4BN which is a tank that meets a 4 bar (400 kPa) pressure requirement, thus the IBC for 35 percent ammonia is tested to a higher pressure than a tank. If, as some experts suggested, the calculated pressure test does not give a sufficient safety factor for warmer climate operations then they need to bring proposals forward to amend 4.1.1.10 in three places to “increase the safety margins” and, in consequence, would need to validate all the existing tank pressure test requirements.

5. One delegate expressed concerns that the provisions in 4.1.1.10 cannot be fulfilled under certain circumstances with IBCs. We are not clear which provisions cannot be fulfilled and would welcome the expert to clarify this, by providing further details so we may address these concerns. If the delegate meant that some IBCs, when tested according to the requirements of 4.1.1.10, would not pass the tests, then the United Kingdom’s view would be that they are not a suitable design type.

6. Another delegation was opposed to the proposal on the grounds that exceptions should not be made for particular products, and they preferred to keep B11 as it is. However, B11, has not been adopted by ADR or RID in packing instruction IBC03; B11 only appears within the UN *Model Regulations* and the IMDG Code.

7. The objection that exceptions should not be made for particular products rather belies the fact that there are multiple exceptions in the regulations for various substances and items or small groups of them (e.g. P001 has 9 PP provisions of which PP1 applies to four UN numbers, PP93 to two UN numbers and the rest to one UN number) and rather goes against the general principles of the regulations which are not to block trade when it can be conducted safely.

8. The United Kingdom have agreed with the Joint Meeting chair and the secretariat to chair an informal working group lunchtime on Tuesday 26 March to provide a further opportunity to discuss the United Kingdom proposals and to respond to any outstanding issues from other delegations.

9. Depending on the outcome of the lunchtime informal working group, the United Kingdom will either reintroduce the proposed new special provision or host a further informal working group to resolve any remaining substantive issues.

² University of Illinois, Engineering Experiment Station. Bulletin No 146 February 1925. The total and partial vapor pressures of aqueous ammonia solutions.