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Inland Transport Committee

Working Party on the Transport of Dangerous Goods

Joint Meeting of Experts on the Regulations annexed to the European Agreement concerning the International Carriage of Dangerous Goods by Inland Waterways (ADN) (ADN Safety Committee)

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Item 3 (c) of the provisional agenda
Implementation of the ADN:
Interpretation of the Regulations annexed to ADN

Submerged motors for LNG systems on inland navigation vessels

Transmitted by the Government of Belgium[1, 2]

1. During the previous meeting of the CCNR working group on inspection regulations (RV/G), the Belgian delegation asked the German delegation for information about the use of submerged motors for the liquefied natural gas (LNG) system of the "E-power barge". Also see report RV/G (14)m 28.

2. The information obtained from the German delegation shows that the pump unit in question is TC-34 by the firm ACD. According to this firm such units have been used in shipping for over 15 years.

I. Advantages of such a system

3. The pump and electric motor constitute a compact whole that is positioned entirely inside the LNG tank. It does not require a mechanical shaft lead-through, so that the lead-

[1] In accordance with the programme of work of the Inland Transport Committee for 2012-2016 (ECE/TRANS/224, para 94, ECE/TRANS/2012/12, programme activity 02.7, (A1b)).

[2] Distributed in German by the Central Commission for the Navigation of the Rhine under the symbol CCNR/ZKR/ADN/WP.15/AC.2/2014/30.

throughs through the tank deck can be restricted to pipelines and electrical cables. The motor is started after de-aerating the unit and filling up with LNG, the required safety measures against the unit running "dry" being provided.

II. Drawbacks of such a system

4. An LNG tank is considered an area with an explosion risk and accordingly is classified as a "zone 0" risk. The electric motor used has no certification to be used in such a zone.

5. This means that as regards the explosion hazard, a residual risk will remain. Should oxygen in any way end up in the tank (for instance because the crew did not operate it correctly or because of damage to the tank) the motor should be considered an ignition source that might cause an explosion.

III. Consequences for drafting the rules for using LNG as fuel

6. As regards the above-mentioned risk, the working group could consult one of the registered organizations that certify such equipment (for instance DEKRA/KEMA in the Netherlands or Physikalisch-Technische Bundesanstalt in Germany).

7. Authorizing such submerged motors would in any case require a change to Appendix T, chapter 4 of proposal RV/G (14) 15 concerning the rules for using LNG as fuel:

"f) **By derogation to part c** submerged **motors for** gas-fuel pumps and related electricity cables may be installed in fuel systems. In case of a low liquid level……be disconnected."

IV. Possible consequences for the ADN

8. The use of submerged electric motors in the cargo tanks of a Type G tanker is prohibited in 9.3.1.52.1 of the ADN. Authorising this for the transport of UN No. 1972 LNG would therefore require an amendment to ADN.

9. It should also be noted that contrary to the ADN, but in accordance with the International Code for the Construction and Equipment of Ships Carrying Liquefied Gases in Bulk (IGC Code), the regulations of a number of approved classification societies authorize these electric motors. For instance for Bureau Veritas, see informal document INF. 13 of the 24th session of the ADN Safety Committee (reference: Part D, Chapter 9, Section 10, 2.2.2).