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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)

Twenty-fourth session

Geneva, 27–31 January 2014

Item 5 (b) of the provisional agenda

**Proposals for amendments to the Regulations annexed to ADN:
Other proposals**

Requirements in ADN related to substances

Transmitted by the European Barge Union (EBU)^{1,2}

Introduction

1. EBU for the first time presented the idea behind this proposal at the twenty-third session of the ADN Safety Committee, giving the example of a vessel that “throughout its service life” carries only heavy oil. Such a vessel currently cannot obtain a certificate of approval as a “closed-type” vessel unless it has first been fitted with all the equipment required to protect against explosion. Such equipment may thereafter be removed in the case of the transport of heavy oil, and would subsequently never be necessary.
2. In principle, the Safety Committee considered well founded the EBU view that such a procedure was irrational (see ECE/TRANS/WP.15/AC.2/48, para. 65). Despite this, the proposal has not yet been adopted. It was noted that the EBU proposal could lead to misinterpretations. Specifically, it was feared that after the parts required to ensure safety

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

² Distributed in German by the Central Commission for the Navigation of the Rhine in document CCNR-ZKR/ADN/WP.15/AC.2/2014/24.

were removed, they might later be reinstalled without being inspected, thus producing a safety hazard.

3. The new proposal presented below is aimed at making it clear that when “closed-type” vessels are constructed and approved, if the list of substances authorized for transport includes only substances for which protection against explosion is **not required** under column (17) of Table C, equipment to protect against explosion will not be required.

4. The proposal made at the twenty-third session of the ADN Safety Committee to settle the issue by inserting a comment in column (20) of Table C does not address the concerns raised by EBU, whose aim is to better orient the requirements for the construction and fitting of vessels to meet the needs of the substances in question.

5. This is not a new objective. It has already been applied in several parts of ADN (for example in 9.3.x.22.5, for vapour pipes). With its current proposal (for the transport of heavy oils a closed-type vessel is required), EBU is continuing to promote the principle according to which the ADN requirements should be related to the substances transported.

6. The proposal is presented in two parts:

Part 1: Flame arresters required only when protection against explosion is required (see twenty-third session of the ADN Safety Committee);

Part 2: Protection against explosion of electrical equipment (by extension).

Part 1: Flame arresters required only when protection against explosion is required (twenty-third session of the ADN Safety Committee)

Proposal

7. At the twenty-third session of the ADN Safety Committee, EBU was requested to describe the situation more clearly. The wording used by the twenty-third session appears underlined, below. Additions appear in *italics*. All other passages are existing texts.

8. EBU proposes the following:

9. In 1.2.1, Definitions, amend the text as follows for “sampling opening”:

“Sampling opening means an opening with a diameter of not more than 0.30 m. When the list of substances on the vessel according to 1.16.1.2.5 contains substances for which protection against explosion is required in column (17) of Table C of Chapter 3.2, it shall be fitted with a flame arrester plate stack, capable of withstanding steady burning and so designed that the opening period will be as short as possible and that the flame arrester plate stack cannot remain open without external intervention. The flame arrester plate stack shall be of a type approved by the competent authority for this purpose;”

10. Amend 9.3.2.22.4 (a) and 9.3.3.22.4 (a) (pressure relief device) to read as follows:

“(a) Each cargo tank or group of cargo tanks connected to a common vapour pipe shall be fitted with:

- safety devices for preventing unacceptable overpressures or vacuums. When anti-explosion protection is required in column (17) of Table C of Chapter 3.2, the vacuum valve shall be fitted with a flame arrester capable of withstanding a deflagration and the pressure-relief valve with a high-velocity vent valve capable of withstanding steady burning.

The gases shall be discharged upwards. The opening pressure of the high-velocity vent valve and the opening pressure of the vacuum valve shall be indelibly indicated on the valves;

- a connection for the safe return ashore of gases expelled during loading;
- a device for the safe depressurization of the tanks. *When the list of substances on the vessel according to 1.16.1.2.5 contains substances for which protection against explosion is required in column (17) of Table C of Chapter 3.2, this device shall include at least a fire-resistant flame arrester and a stop valve which clearly indicates whether it is open or shut.*

11. Amend 9.3.2.20.4 and 9.3.3.20.4 (ventilation of cofferdams) to read as follows:

“When the list of substances on the vessel according to 1.16.1.2.5 contains substances for which protection against explosion is required in column (17) of Table C of Chapter 3.2, the ventilation openings of cofferdams shall be fitted with a flame-arrester withstanding a deflagration.”

Justification

12. The requirements in question are supposed to protect against explosion with flame arresters capable of withstanding steady burning and are applicable under ADN to **all** “closed-type” vessels, without distinction, whether or not protection against explosion is required under column (17) of Table C for the substances being transported. In cases where protection against explosion is not required, the flame arresters are not necessary.

13. ADN already frames a number of requirements in relation to the substances transported. For many questions relating to equipment, ADN already makes a distinction depending on whether a “closed-type” vessel transports substances requiring or not requiring protection against explosion (for example, 9.3.x.22.5, on vapour pipes). However, this principle has not been consistently followed in respect of flame arresters.

14. The present proposal is aimed at establishing a straightforward relationship between the equipment on a vessel and the list of substances. During the construction or transformation of a “closed-type” vessel, it should only be permitted to refrain from fitting the vessel with protection against explosion if the list of substances accepted for the vessel (1.16.1.2.5) contains only substances for which protection against explosion **is not** required under column (17) of Table C of Chapter 3.

15. Closed-type vessels intended for the transport of both (i.e., substances for which protection is required and for which it is not required) cannot receive a certificate of approval as “closed-type vessels” unless they are equipped with protection against explosion.

Part 2: Protection against explosion of electrical equipment (by extension)

16. Part 2 of the EBU proposal advances a step closer to framing ADN requirements in accordance with the substances carried. While part 1 focuses on flame arresters, part 2 addresses electrical protection. When throughout its service life a vessel transports only substances for which protection against explosion is not required and such a vessel is accepted under such conditions, such a situation can be taken into account in respect of the way the vessel is equipped and operated. It would be senseless to require such vessels to be equipped with protection against dangers that cannot exist on board.

17. The system now being drawn up for protection against explosion is the same in all aspects. Here too, the future requirements are thus separated between those for vessels requiring protection against explosion and those not requiring such protection (column (17) of Table C of Chapter 3.2). With heavy oils included in ADN and the expiration of multilateral agreements, such questions need to be addressed immediately, regardless of the new approach to protection against explosion.

Proposal

18. The current ADN sections 9.3.2.52.1 and 9.3.3.52.1 address the type and location of electrical equipment. EBU proposes linking the questions covered by 9.3.2.52.1 and 9.3.3.52.1 with the question of whether the vessel actually transports substances for which protection against explosion is required. The proposed new text is underlined.

19. Amend 9.3.2.52.1 and 9.3.3.52.1 to read as follows:

“When the list of substances on the vessel according to 1.16.1.2.5 contains substances for which protection against explosion is required in column (17) of Table C of Chapter 3.2,

(a) Only the following equipment may be installed in cargo tanks, residual cargo tanks and piping for loading and unloading (comparable to zone 0):

- measuring, regulation and alarm devices of the EEx (ia) type of protection.

(b) Only the following equipment may be installed in the cofferdams, double-hull spaces, double bottoms and hold spaces (comparable to zone 1):

- measuring, regulation and alarm devices of the certified safe type;
- lighting appliances of the “flame-proof enclosure” or “pressurized enclosure” type of protection;
- hermetically sealed echo sounding devices the cables of which are led through thick-walled steel tubes with gastight connections up to the main deck;
- cables for the active cathodic protection of the shell plating in protective steel tubes such as those provided for echo sounding devices.

(c) Only the following equipment may be installed in the service spaces in the cargo area below deck (comparable to zone 1):

- measuring, regulation and alarm devices of the certified safe type;
- lighting appliances of the “flame-proof enclosure” or “apparatus protected by pressurization” type of protection;
- motors driving essential equipment such as ballast pumps; they shall be of the certified safe type.

(d) The control and protective equipment of the electrical equipment referred to in paragraphs (a), (b) and (c) above shall be located outside the cargo area if they are not intrinsically safe.

(e) The electrical equipment in the cargo area on deck (comparable to zone 1) shall be of the certified safe type.”

Justification

20. When “throughout its service life” a vessel transports only goods not requiring protection against explosion, equipment without such protection can be chosen. This is not possible without the addition of the proposed amendment.

Proposal

21. EBU proposes to deal with the questions covered by 9.3.2.52.3 and 9.3.3.52.4 in the same manner, depending on whether the vessel is or is not transporting substances requiring protection against explosion. The proposed new text is underlined.

22. Amend 9.3.2.52.3 and 9.3.3.52.4 to read as follows:

“(a) “When the list of substances on the vessel according to 1.16.1.2.5 contains substances for which protection against explosion is required in column (17) of Table C of Chapter 3.2, the electrical equipment used during loading, unloading and gas-freeing during berthing and which are located outside the cargo area shall (comparable to zone 2) be at least of the “limited explosion risk” type.

(b) This provision does not apply to:

(i) lighting installations in the accommodation, except for switches near entrances to accommodation;

(ii) radiotelephone installations in the accommodation or the wheelhouse;

(iii) mobile and fixed telephone installations in the accommodation or the wheelhouse;

(iv) electrical installations in the accommodation, the wheelhouse or the service spaces outside the cargo areas if:

1. These spaces are fitted with a ventilation system ensuring an overpressure of 0.1 kPa (0.001 bar) and none of the windows is capable of being opened; the air intakes of the ventilation system shall be located as far away as possible, however, not less than 6.00 m from the cargo area and not less than 2.00 m above the deck;

2. The spaces are fitted with a gas detection system with sensors:

- at the suction inlets of the ventilation system;
- directly at the top edge of the sill of the entrance doors of the accommodation and service spaces;

3. The gas concentration measurement is continuous;

4. When the gas concentration reaches 20% of the lower explosive limit, the ventilators are switched off. In such a case and when the overpressure is not maintained or in the event of failure of the gas detection system, the electrical installations which do not comply with (a) above, shall be switched off. These operations shall be performed immediately and automatically and activate the emergency lighting in the accommodation, the wheelhouse and the service spaces, which shall comply at least with the “limited explosion risk” type. The switching-off shall be indicated in the accommodation and wheelhouse by visual and audible signals;

5. The ventilation system, the gas detection system and the alarm of the switch-off device fully comply with the requirements of (a) above;
6. The automatic switching-off device is set so that no automatic switch off may occur while the vessel is under way.”

Justification

23. When a vessel transports only goods for which no protection against explosion is required during its entire service life, this proposal will make it possible to do without pressure relief devices, including flammable gas detectors, and to install devices that do not correspond with types involving a limited risk of explosion. The reason for this provision is to avoid the entry of explosive atmospheres emanating from the cargo into spaces outside the cargo area. Such a reason exists only when the list of substances on the vessel contains substances for which protection against explosion is required.
