

**Economic and Social Council**

Distr.: General
15 June 2023
English
Original: French

Economic Commission for Europe**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)

Forty-second session

Geneva, 21–25 August 2023

Item 4 (b) of the provisional agenda

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

7.2.4.22 of ADN: Opening of openings**Transmitted by the Government of Germany***, **, ***

Executive summary: The service requirements contained in subsection 7.2.4.22 of ADN relating to the “opening of openings” on board inland waterway tank vessels date back several decades. They do not take into account the current needs of carriers, fillers and unloaders in the operational process of transporting liquid dangerous goods. In addition, the conditions under which openings can be opened are not presented in a sufficiently systematic way and are not sufficient to reliably and adequately limit the risks arising from gases or vapours released from cargo tanks. Subsection 7.2.4.22 of ADN should therefore be amended.

Action to be taken: Complete revision of subsection 7.2.4.22 of ADN, to take into account the needs of carriers, fillers and unloaders of cargo tanks and to define the conditions necessary to ensure safe handling of cargo.

The aim is to specify which openings can be opened and for what purpose. Safety measures need to be revised. This involves laying down general conditions applicable to every opening. Furthermore, additional special conditions should apply to certain activities, such as the visual inspection of unloaded cargo tanks.

* This document was submitted late due to unforeseen circumstances.

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*** A/77/6 (Sect. 20), table 20.6.



Related documents:	<p>ECE/TRANS/WP.15/AC.2/2022/43</p> <p>ECE/TRANS/WP.15/AC.2/2022/45</p> <p>Informal document INF.19 of the fortieth session</p> <p>ECE/TRANS/WP.15/AC.2/82 (paras. 51 and 52)</p> <p>Informal document INF.6 of the forty-first session (Germany)</p> <p>ECE/TRANS/WP.15/AC.2/84 (para. 37)</p>
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Introduction

1. During its forty-first session, the Safety Committee considered the German delegation's initiative to completely revise the requirements for opening of openings, as currently set out in subsection 7.2.4.22 of ADN, and to adapt them to the current requirements for the operation of inland waterway tank vessels. This involves taking account of operational requirements for handling cargo and introducing certain safety measures. People on board vessels and at filler and unloader shore facilities must not be exposed unnecessarily to harmful gases and vapours, the environment must be polluted as little as possible by toxic gases and vapours, and the risk of explosion from flammable gases and vapours must be reduced as far as possible.
2. After responding at this meeting to a number of sometimes very detailed questions from other delegations concerning the first proposed amendment of 9 June 2022 and examining several proposals for improvements, the delegation of Germany submits herewith a revised amendment proposal for ADN 2025.
3. These amendments are intended to be incorporated permanently into the Regulations annexed to ADN, and are not an extended ban on "opening of openings" that could be accompanied by a transitional provision. There are no technical or operational alternatives that could be used to completely dispense with the need to open cargo tanks. The indications given by other delegations concerning technical solutions were very vague and could not be verified.
4. For the detailed reasons behind the proposed amendments and their justification, please refer to the previous documents. Only the reworded paragraphs are commented on in greater detail in section II.

I. Proposal

5. Germany requests the Safety Committee to examine and confirm the following proposed amendments.

Section 1.2.1, Definitions

6. In 1.2.1, in the definition of "sampling opening," add the following sentence at the end:

"Other cargo tank openings, except cargo tank hatches, shall be deemed to be a sampling opening if they comply with the aforementioned requirements."

Subparagraph 7.2.3.7.1.3, Degassing of cargo tanks into the atmosphere

7. After the first sentence of 7.2.3.7.1.3, insert the following sentences:
 - "The gas/air mixture from cargo tanks may only be discharged into the atmosphere
 - (a) Through the device for the safe depressurization of cargo tanks [prescribed in 9.3.2.22.4 (a) and 9.3.2.22.4 (b) or 9.3.3.22.4 (a) and 9.3.3.22.4 (b)], or
 - (b) Through the sampling opening [(9.3.2.21.1. (g) or 9.3.3.21.1 (g))], or

- (c) Through the open housing of the flame arrester at the connection point of the cargo tank and the venting piping [(9.3.2.22.4 (b) or 9.3.3.22.4 (d))], or
- (d) Through a suitable hose that is connected to the venting piping and equipped with a flame arrester preceding the hose (explosion group/subgroup according to column (16) of Table C of Chapter 3.2).”

Subsection 7.2.4.22, Opening of openings

8. Amend 7.2.4.22, Opening of openings of cargo tanks, to read as follows:

“7.2.4.22 Opening of openings of cargo tanks (general)

7.2.4.22.1 7.2.4.22 and 7.2.4.23 apply only to type N and type C tank vessels.

By way of derogation from subsection 7.2.3.22, and provided that it is not prohibited by other regulations, the opening of openings is permitted under the following conditions:

- For cleaning and replacement of flame arrester plate stacks
- For visual inspection from the deck
- For sampling
- For the connection of a tank washing system
- For gas measurement
- For the determination of the filling quantity in a cargo tank in exceptional cases and
- For the subsequent addition of stabilizer during the journey in exceptional cases

7.2.4.22.2 Opening of cargo tanks is permitted only if the vessel is not connected to the shore facility or if the shut-off devices of the vessel and the shore facility are closed.

Opening of openings of cargo tanks is permitted only after the depressurization of the relevant cargo tanks by means of the device for the safe depressurization of cargo tanks prescribed in 9.3.2.22.4 (a) and 9.3.2.22.4 (b) or 9.3.3.22.4 (a) and 9.3.3.22.4 (b).

When explosion protection is required under column (17) of Table C of Chapter 3.2, the opening of cargo tank hatches shall be permitted only if the cargo tanks in question are discharged and the concentration of flammable gases in the tank is less than 10% of the lower explosive limit of the cargo/previous cargo. The results of the measurements shall be recorded in writing. Entry into these cargo tanks is not permitted for the purpose of measuring.

7.2.4.22.3 Opening of openings of cargo tanks loaded with substances for which marking with one or two blue cones or one or two blue lights is prescribed in column (19) of Table C of Chapter 3.2 shall be permitted only when loading has been interrupted for not less than 10 minutes.

7.2.4.22.4 For the replacement of flame arrester plate stacks for the purpose of cleaning or replacement with flame arrester plate stacks of the same design, the following conditions shall be met:

- (a) Cleaning and replacing of the flame arrester plate stack shall be carried out only by trained and qualified personnel;
- (b) Opening is permitted only when the relevant cargo tanks are discharged and the concentration of flammable gases in the cargo tank is less than 10% of the lower explosive limit of the cargo/previous cargo;
- (c) The results of the measurements shall be recorded in writing.

7.2.4.22.5 For repairs on the flame arrester housing, 8.1.7.3 shall apply.

7.2.4.22.6 If the venting piping is equipped with a flame arrester at its connection to the cargo tank in accordance with 9.3.2.22.4 (b)/9.3.3.22.4 (d), this housing may be opened for the purpose of sampling, a visual inspection of the cargo tanks, determining the filling quantity in the cargo tank or the subsequent addition of stabilizer.

7.2.4.22.7 The operations for the opening of openings shall be carried out using only appropriate low-sparking hand tools.

On board vessels covered by the classification of zones as defined in section 1.2.1, all electrical and non-electrical appliances and devices used for activities on open cargo tanks shall meet the requirements for use in zone 0.

7.2.4.22.8 The duration of opening shall be limited to the time necessary for the measures described under 7.2.4.22.1. Opening the cargo tanks immediately before and after as well as during a thunderstorm shall be prohibited.

7.2.4.22.9 The working instructions concerning explosion protection in accordance with 1.3.2.5 shall be available and applied on board.

7.2.4.22.10 Persons who open openings or who are in the immediate vicinity of an opening shall use the equipment prescribed in column (16) of Table C of Chapter 3.2.

7.2.4.22.11 In the case of a visual inspection, determination of the filling quantity, gas measurement or addition of stabilizer, 7.2.4.16.8 shall apply accordingly.

7.2.4.22.12 When closing the sampling opening or the flame arrester housing, the flame arrester shall be checked for damage, soiling and correct installation and be repaired, where necessary, before the journey is continued.

7.2.4.22.13 The provisions of 7.2.4.22.1 to 7.2.4.22.11 and of 7.2.4.23 shall not apply to oil separator or supply vessels.

7.2.4.22.14 To wash cargo tanks, only the special connection opening for tank washing systems provided for this purpose on the cargo tank may be used.”

New subsection 7.2.4.23

9. Add a new 7.2.4.23, to read as follows:

“7.2.4.23 Measures on the cargo tank that require opening cargo tanks that have not been degassed

7.2.4.23.1 Visual inspection of discharged and empty cargo tanks

7.2.4.23.1.1 Discharged cargo tanks shall only be opened for visual inspection to verify that the cargo tanks are empty and/or clean when the vessel is not connected to the shore facility.

7.2.4.23.2 Sampling, determination of the filling quantity, addition of stabilizer and gas measurement

7.2.4.23.2.1 The sampling receptacles including all accessories such as ropes, etc., shall consist of electrostatically conductive material and shall be electrically connected to the vessel’s hull.

7.2.4.23.2.2 Sampling shall be permitted only if a device prescribed in column (13) of Table C of Chapter 3.2 or a device ensuring a higher level of safety is used.

7.2.4.23.2.3 In the event of a malfunction of the sampling device that cannot be solved in the short term, sampling via the sampling opening shall be permitted.

7.2.4.23.2.4 The opening of cargo tanks for open sampling should only be carried out when the vessel is not connected to the shore facility. First foot samples during loading may also be taken when the vessel is connected to the shore facility provided that the shut-off devices on the vessel and at the shore facility are closed.

7.2.4.23.2.5 If the quantity of the cargo measured by the filler differs from the quantity determined on board by means of measuring instruments, the filling quantity in the cargo tank may be determined manually via the sampling opening using a measuring tape and a thermometer.

The measuring instruments used for determining the filling quantity in cargo tanks shall consist of electrostatically conductive material and shall be electrically connected to the vessel’s hull during measuring. The measuring instrument shall be suitable for use in zone 0.

7.2.4.23.2.6 If an unforeseen extension of the navigation time requires the addition of extra stabilizer to one or more cargo tanks during transport, this is only permitted through the sampling opening. Electrostatic charges shall be prevented.

7.2.4.23.2.7 The requirements in accordance with 7.2.3.1.4 shall apply additionally for gas measurement.”

Section 8.6.4, Checklist degassing to reception facilities

10. In 8.6.4 (Checklist degassing to reception facilities), amend question No. 10 as follows:

“Are all cargo tank hatches and other cargo tanks openings closed or, if appropriate, protected by flame arresters in good condition?”

II. Justification

Paragraph 9:

11. In accordance with the conditions set out in the revised subsection 7.2.4.22, other openings are only equivalent to a sampling opening and may only be used for the same purpose if they meet the following requirement:

- Its diameter must not exceed 30 cm and it must be closable.

12. If the vessel substance list includes substances for which explosion protection is required in accordance with Table C,

- The opening must also be designed to be deflagration safe and capable of withstanding steady burning for the most critical substance in the vessel substance list; this means it must be fitted with an appropriate flame arrester
- The opening must allow for the opening period to be as short as possible
- The opening must be designed so that it cannot remain open without external intervention

13. Under current construction rules, the requirements can only be met by installing the gas venting piping mentioned in the first indent of 9.3.x.22.4 (b). This is already used on most vessels today for the same purposes as a sampling opening.

14. According to information available to the German delegation, this explains why, for many years now, dedicated sampling openings have been dispensed with during the construction of new vessels.

Paragraph 11:

15. Usually, no openings are opened during transport on board Type G tank vessels, as the gas cargo would then immediately escape from the cargo tanks. Measures such as open sampling or visual inspection are also not necessary when the cargo consists of gas.

16. Delete the current first sentence of 7.2.4.22.5 of ADN: “Opening of the housing of the flame arresters is permitted only for the cleaning of the flame arrester plate stack or replacement by flame arrester plate stacks of the same design.”

17. It is clear that the housing must also be open for other essential activities on the cargo tank, such as open sampling, visual inspection of the contents of the cargo tank or discharge of the gas/air mixture when degassing the cargo tank (amendment to 7.2.3.7.1.3).

18. The limitation to specific purposes now follows from 7.2.4.22.1.

19. Separation of the vessel from shore facilities or piping (new 7.2.4.22.2) is relevant when the vessel contains flammable cargo. The aim is to prevent burning cargo from spreading to the onshore facility in the event of an incident involving the opening.

20. The opening for the connection to tank washing systems mentioned in 7.2.4.22.13 is present on most vessels – with the agreement of the classification societies.

21. However, sections 9.3.2 and 9.3.3 of ADN do not yet include construction requirements for these connections. We assume that safety aspects are sufficiently taken into account in the class rules and that the delegation from the European Skippers Organisation (ESO) and the recommended ADN classification societies and the European Barge Union (EBU) will take appropriate account of this in its announced proposal on tank washing.

22. The other requirements are already included in the current ADN with a different numbering.

III. Safety

23. The principle set out in sub-section 7.2.3.22 that cargo tanks and residual cargo tanks must remain closed unless specific exceptions are described in Part 7 will be fully retained. Just as with the degassing of cargo tanks, which also involves the opening of openings, the opening is only permitted if the release of gases and vapours from the cargo tanks is not prohibited by other rules and regulations.

24. These requirements, together with the other service requirements in Chapter 7.2, ensure that no cargo can leak into the waterway through the openings and that the people involved in opening the cargo tanks are not exposed to unnecessary health risks.

25. The safety measures identified as necessary and appropriate are as follows:

- Openness is limited to explicitly specified measures
- Cargo tanks must be decompressed before opening
- The vessel must not be connected to the shore facility and the shut-off devices on the vessel and shore facility must be closed
- When explosion protection is required for the cargo, the opening of cargo tank hatches shall be permitted only if the cargo tanks in question are empty and the concentration of flammable gases in the tank is less than 10% of the lower explosive limit of the cargo/previous cargo
- If cones/blue lights are required for the cargo, the opening of openings shall be permitted only if loading has been interrupted for at least 10 minutes
- The replacement of flame arrestors in openings may only be carried out by specially trained personnel and only if the cargo tanks in question are empty and the concentration of flammable gases in the tank is less than 10% of the lower explosive limit of the cargo/previous cargo
- The operations for the opening of openings shall be carried out using only appropriate low-sparking tools
- The working instructions concerning explosion protection in accordance with 1.3.2.5 shall be available and applied on board
- The opening period must be limited to what is strictly necessary
- Persons who open openings or who are in the immediate vicinity of an opening shall use the equipment prescribed in column (18) of Table C of Chapter 3.2

26. Restructuring of the requirements for the opening of openings and the taking into account of all known uses (which is not yet the case in ADN 2023) will make the requirements easy to understand, clear, enforceable and verifiable. Additional individual interpretation to fill regulatory gaps is no longer necessary. This obviates the need for alternatives that are dubious in terms of safety. It is clearly indicated for which activities precautions must be taken in order to limit as far as possible the leakage of flammable or toxic gases/vapours from the cargo tanks and to provide the best possible protection for personnel working on the cargo tanks (ship's crew, shore facilities personnel, external service providers).

IV. Feasibility

27. No implementation problems are to be expected since, depending on the interpretation of existing regulations, the proposed approach has probably already been adopted in practice.

28. No changes are required on cargo tanks. As a result, changes to the regulations do not entail any financial investment.

V. Sustainability

29. The requirements for opening of openings can be linked to the following Sustainable Development Goals. (See INF.23 of the spring 2023 session of the RID/ADR/ADN Joint Meeting).

Goal 3. Good health and well-being

30. The proposed rules will ensure the safe handling of hazardous chemicals during transport. The parties involved will receive adequate information on how to handle dangerous goods.

Goal 6. Clean water and sanitation

31. The proposed requirements will help to prevent the discharge of dangerous goods into waterways from open cargo tanks, in order to prevent water pollution.

Goal 8. Decent work and economic growth

32. All employees working on board inland waterway tank vessels in the ADN member States, as well as all employees working for tanker fillers and unloaders, will be afforded an equivalent level of protection and have access to information that allows them to take appropriate protective measures at their place of work, depending on the dangerous goods they handle.

Goal 17. Partnerships for the Goals

33. Pointing out that the opening of openings, and therefore the release of harmful gases and vapours from cargo tanks, may be prohibited by other regulations in order to avoid accidents and damage to people or the environment, i.e. for reasons other than transport safety, will facilitate the achievement of these goals and contribute to them in a spirit of partnership.
