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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)****Thirty-eighth session**

Geneva, 23–27 August 2021

Item 4 (b) of the provisional agenda

**Proposals for amendments to the regulations annexed to the ADN:
other proposals****Loading and unloading instructions****Submitted by the Government of the Netherlands* ****

Executive summary:	The document aims to introduce amendments in the ADN to clarify a uniform format for the loading and unloading instructions.
Action to be taken:	In paragraph 13 the ADN Safety Committee is requested to adopt the proposed amendments.
Related documents:	Informal document INF.12 of the thirty-fourth session ECE/TRANS/WP.15/AC.2/70 (paragraphs 16-17) Informal document INF.9 of the thirty-fifth session ECE/TRANS/WP.15/AC.2/72 (paragraphs 14-16) ECE/TRANS/WP.15/AC.2/2020/37 ECE/TRANS/WP.15/AC.2/76 (paragraphs 71-72)

Introduction

1. The Regulations annexed to ADN contain multiple specific requirements on loading and unloading rates. Detailed requirements concerning the maximum permissible loading and unloading flows contribute to the prevention of electrostatic charging of the cargo, spills and the implosion or explosion of the cargo tank. However, the prescriptions in the

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Regulations annexed to ADN lack a significant amount of detail concerning the loading and unloading instructions.

2. Because the current prescriptions are drafted in such a general way, over the last decades a wide variety of formats has been developed by the filling and carrying industry to fulfil the requirements in the Regulations annexed to ADN. A safe loading and unloading process requires essential information from both the carrying vessel and the (vapour density of the) carried substance. Unfortunately, this information is not always shared or used in the right way, thus creating potentially dangerous situations during loading and unloading. In practice, sometimes the wrong documents, such as the Pressure Drop Calculation (which is carried out during the construction of the vessel) and the Design Appraisal Document, have been “used” as a loading and unloading instruction.

3. During the thirty-fourth and thirty-fifth sessions of the ADN Safety Committee the Netherlands introduced a format for the loading and unloading instructions, which was developed in 2018 by a cooperation between the Dutch inspection bodies, filling industry and carrying industry. The format ensures efficient filling operations and at the same time prevents electrostatic charging, spills and implosions or explosions of the cargo tank. During the thirty-fifth session EBU/ESO presented this format to the Safety Committee. The Safety Committee welcomed the initiative to develop a general format for loading and unloading instructions containing permissible loading and unloading flows, taking into account the specific barge configuration as well as the substance characteristics.

4. Two examples of the uniform loading and unloading instructions can be found in informal document INF.2.

5. During the thirty-seventh session of the ADN Safety Committee some concerns were raised on the availability of the vapour density data, and the way to proceed in the absence of vapour density data. Both filling representatives and inspection bodies have confirmed that, vapour density information is readily available. Lists with vapour density data for ranges of products have been developed by fillers and consignors. In the case vapour density data is not available, a worst-case scenario is applied to guarantee the safety of all participants. This results in loading rates which are maximally decreased.

Clarification on the proposed amendments

6. During the thirty-fifth session of the ADN Safety Committee the question arose who will be responsible for drafting the loading and unloading instructions. Because the loading and unloading instructions will play an important role in the safety of all loading and unloading operations, the Dutch delegation proposes to require the classification society which classified the vessel to draft and issue the loading and unloading instructions. This will also facilitate the uniform format of the loading and unloading instructions.

7. Existing specifications and requirements concerning the loading and unloading instructions can be found in 7.2.4.16.15 and 9.3.X.25.9. The requirements for the calculations necessary to draft the loading and unloading instructions and the requirements on the use of the loading and unloading instructions are intermingled. The Dutch delegation proposes to merge the requirements for the calculations and drafting of the loading and unloading instructions in one place. Since the calculations for the drafting of the loading and unloading instructions are related to the specific barge configuration it is proposed to merge the requirements for the calculations and drafting in Chapter 9.

8. The requirements for the use of the loading and unloading instructions are proposed in Chapter 7. The initial, middle and end maximum loading rates should be established using the loading and unloading instructions. However, the master of the vessel should have the possibility to deviate from the maximum loading flows described in the loading and unloading instructions due to local circumstances or nautical reasons. The loading rates to be used should be agreed upon between the master and the personnel of the shore installation taking into account the maximum loading rates and other circumstances, as proposed in 7.2.4.16.1. A consequential amendment to 8.6.3 on the ADN Checklist is proposed.

9. The filler has a specific responsibility to ascertain that the loading flows conform the loading and unloading instructions (1.4.3.3.s). To do this, the filler needs to supply the relevant vapour density data of the substance to be loaded, to properly use the loading and unloading instructions. However, the filler should be able to rely on information and data made available to him by the consignor. Amendments to reflect this are also proposed.

10. The instructions are included in the list of documents to be carried on board tank vessels (8.1.2.3.i), so an amendment to align the wording throughout the ADN is proposed. Since it is not usual in ADN to have a definition for documents, it is not proposed to include a definition of the loading and unloading instructions in the ADN.

Amendments

11. Proposed amendments are **bold and underlined**, ~~deleted text is stricken through~~:

Renumber 1.4.3.3 to 1.4.3.3.1 and amend as follows:

1.4.3.3 Filler

1.4.3.3.1 In the context of 1.4.1, the filler has the following obligations in particular:

...

1.4.3.3.1 (s)

He shall **supply the vapour density of the substance to be loaded and** ascertain that the loading flows conform to **do not exceed the maximum loading flows according to** the loading and unloading instructions referred to in 9.3.2.25.9 or 9.3.3.25.9 and that the pressure at the connecting-point of the vapour return piping and the venting piping is not greater than the opening pressure of the pressure relief valve/high velocity vent valve;"

Add a new 1.4.3.3.2 as follows:

1.4.3.3.2

The Filler may, however in the case of 1.4.3.3.1 (s) rely on information and data made available to him by other participants."

Amend 1.4.3.7.1 (j) to read:

"Ascertain that the unloading flows conform to the instructions on loading and unloading flows **do not exceed the maximum unloading flows according to the loading and unloading instructions** referred to in 9.3.2.25.9 or 9.3.3.25.9 and that the pressure at the connecting-point of the vapour return piping and the venting piping or the gas return pipe does not exceed the opening pressure of the pressure relief valve/high velocity vent valve;"

Amend 7.2.4.16.1 to read:

"The **initial, middle and end maximum** loading rate and the maximum operational pressure of the cargo pumps shall be determined in **accordance with the loading and unloading instructions. The initial, middle and end loading rates to be used shall not exceed the maximum rates and shall be determined in** agreement with the personnel of the shore installation."

Delete 7.2.4.16.15 as follows:

~~"The initial cargo throughput established in the loading instructions shall be such as to ensure that no electrostatic charge exists at the start of loading. **(Deleted)**"~~

Amend 8.1.2.3 (i) to read:

"The instructions relating to the loading and unloading flows **loading and unloading instructions** prescribed in 9.3.2.25.9 or 9.3.3.25.9;"

Amend 8.6.3 as follows:

Loading/unloading rate (not to be filled in if vessel is to be loaded with gas or have gas unloaded)								2
Proper shipping name**	Cargo tank number	agreed rate of loading/unloading <u>taking into account the maximum loading/unloading rates according to the loading and unloading instructions</u>						
		start		half way middle		end		
		rate m ³ /h	quantity m ³	rate m ³ /h	quantity m ³	rate m ³ /h	quantity m ³	
.....	
.....	
.....	

Amend 9.3.2.25.9/9.3.3.25.9 to read:

"The permissible loading and unloading flows shall be calculated.

Calculations concern the permissible maximum **initial, middle and end** loading and unloading flow for each cargo tank ~~or~~ **and** each group of cargo tanks, taking into account the design **of the piping for loading and unloading and the design** of the ventilation system. These calculations shall take into consideration the fact that in the event of an unforeseen cut-off of the vapour return piping of the shore facility, the safety devices of the cargo tanks will prevent pressure in the cargo tanks from exceeding the following values:

over-pressure: 1.15 times the opening pressure of the pressure relief valve/high velocity vent valve;

vacuum pressure: not more than the design pressure, but not exceeding a vacuum of 5 kPa (0.05 bar).

The main factors to be considered are the following:

1. **Design of the piping for loading and unloading;**
- ~~42.~~ ~~Dimensions~~ **Design** of the ventilation system of the cargo tanks;
- ~~23.~~ Gas formation during loading: multiply the largest loading flow by a factor of not less than 1.25;
- ~~34.~~ ~~Density of the vapour mixture of the cargo~~ **Multiple relevant vapour densities** based on 50% volume vapour and 50% volume air;
- ~~45.~~ Loss of pressure through ventilation pipes, valves and fittings. Account will be taken of a 30% clogging of the mesh of the flame-arrester;
- ~~56.~~ Chocking pressure of the safety valves;
- 7. The prevention of build-up of electrostatic charge.**

~~Instructions concerning the permissible maximum loading and unloading flows for each cargo tank or for each group of cargo tanks~~ **The loading and unloading instructions shall be approved by the recognized classification society, which classes the vessel. The loading and unloading instructions shall be carried on board.**"

Consequential amendment

12. The Dutch delegation proposes a consequential amendment to add a transitional provision for the new document:

Add in 1.6.7.2.2.2 as follows:

<u>9.3.2.25.9</u> <u>9.3.3.25.9</u>	<u>Loading and unloading</u> <u>instructions</u>	<u>N.R.M.</u> <u>Renewal of the certificate of approval after 31</u> <u>December 2022</u>
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Action to be taken

13. The Dutch delegation requests the ADN Safety Committee to consider the amendments proposed in paragraphs 11 and 12 and to take action as it deems appropriate.