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RULES

FOR THE CLASSIFICATION AND CONSTRUCTION OF CHEMICAL TANKERS

PART VIII INSTRUMENTATION

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RULES FOR THE CLASSIFICATION AND CONSTRUCTION OF CHEMICAL TANKERS

Rules for the Classification and Construction of Chemical Tankers of Russian Maritime Register of Shipping (RS, the Register) have been approved in accordance with the established procedure and come into force on 1 January 2023.

The present edition of the Rules is based on the 2022 edition taking into account the amendments developed immediately before publication.

The provisions of the International Code for the Construction and Equipment of Ships Carrying Dangerous Chemicals in Bulk (IBC Code) with relevant amendments thereto implemented by resolutions MSC.460(101) and MEPC.318(74) of the International Maritime Organization (IMO) have been taken into consideration in the Rules.

The Rules establish requirements, which are specific for ships carrying dangerous chemicals in bulk, and supplement the Rules for the Classification and Construction of Sea-Going Ships and Rules for the Equipment of Sea-Going Ships of Russian Maritime Register of Shipping.

The Rules are published in the following parts:

Part I "Classification";

Part II "Structure of Chemical Tanker";

Part III "Cargo Containment";

Part IV "Stability, Subdivision and Freeboard";

Part V "Fire Protection";

Part VI "Systems and Piping";

Part VII "Electrical Equipment";

Part VIII "Instrumentation";

Part IX "Materials of Construction";

Part X "Personnel Protection";

Part XI "Summary of Technical Requirements";

Part XII "Special Requirements";

The Annexes to the Rules are published separately.

REVISION HISTORY

(purely editorial amendments are not included in the Revision History)

For this version, there are no amendments to be included in the Revision History.

1 GENERAL

1.1 Each cargo tank, depending on the kind of cargo to be carried, shall be fitted with cargo tank level gauging devices, cargo temperature measuring devices, cargo vapour or inert medium pressure measuring devices as well as high level and overflow alarms in accordance with the requirements of Part XI "Summary of Technical Requirements" of the Rules for the Classification and Construction of Chemical Tankers¹.

1.2 Gauging and measuring devices shall be one of the following types:

.1 open device which makes use of an opening in the tanks and may expose the gauger to the cargo or its vapour (e.g. ullage openings);

.2 restricted device which penetrates the tank and which, when in use, permits a small quantity of cargo vapour or liquid to be exposed to the atmosphere. The design of such device shall ensure that no dangerous escape of tank contents (liquid or spray) can take place in opening the device.

A restricted device could be a sounding pipe with inside diameter not exceeding 200 mm, with vapour tight cover in compliance with 2.1.8, Part VIII "Systems and Piping" of the Rules for the Classification and Construction of Sea-Going Ships²;

.3 closed device which penetrates the tank, but which is part of closed system and keeps tank contents from being released (e.g. the float-type systems, electronic probe, magnetic probe and protected sight-glass);

If a closed device cannot be mounted directly on the tank, it may be connected to the tank through a pipe and shut-off valve which shall be situated on the tank or as close as possible to the tank;

.4 indirect device which does not penetrate the tank shell and is independent of the tank. For determining amount of cargo, weighing of cargo, pipe flow meter, etc. are used.

1.3 Open gauging and restricted gauging shall be allowed only where:

.1 open venting is allowed; or

.2 means are provided to relieving tank pressure before the gauge is operated.

1.4 Gauging devices shall be independent of the equipment required under Section 19, Part XII "Special Requirements".

¹ Hereinafter referred to as "these Rules".

² Hereinafter referred to as "the Rules for the Classification".

2 CARGO TANK LEVEL GAUGING DEVICES

2.1 Each cargo tank shall be provided with at least one liquid level gauging device. Type of gauging device shall comply with the requirements of Part XI "Summary of Technical Requirements", depending on the kind of cargo to be carried.

2.2 In case where oil or oil products are carried, the cargo tanks shall be fitted with liquid level gauging devices in conformity with the requirements of 9.11, Part VIII "Systems and Piping" of the Rules for the Classification.

3 CARGO TEMPERATURE MEASURING DEVICES

3.1 Cargo tanks intended for the carriage of cargo at a specified temperature shall be fitted with cargo temperature measuring devices. Type of the device shall comply with the requirements of Part XI "Summary of Technical Requirements", depending on the kind of cargo to be carried.

3.2 Number and arrangement of the temperature measuring devices shall comply with the requirements of Part XI "Summary of Technical Requirements", depending on the kind of cargo to be carried.

4 CARGO VAPOUR PRESSURE MEASURING DEVICES

4.1 Cargo tanks intended for carriage of cargoes with a vapour pressure greater than 0,1013 MPa absolute at 37,8 °C transportation shall be equipped with cargo vapour pressure measuring devices.

In case where toxic products are carried the cargo vapour measuring devices shall be generally mounted without purging valves and, if the purging valves are fitted, purged gas shall be led to safe area.

5 CARGO VAPOUR DETECTION DEVICES

5.1 Chemical tankers intended for carriage of flammable and/or toxic products shall be equipped with two instruments (gas analyzers) designed for detecting the cargo vapours in compliance with the requirements of Part XI "Summary of Technical Requirements", depending on the kind of cargo to be carried.

5.2 One of such instruments may be fixed and serve:

- .1** CPR;
- .2** CCR if they are not considered as gas-safe spaces;
- .3** other enclosed spaces within the cargo area where cargo vapours may accumulate, including hold spaces for independent tanks, except for the cargo tanks themselves.

5.3 Vapour detection instruments may be mounted in CCR, on the navigating bridge or in other appropriate locations.

If such instruments are mounted in gas-safe spaces the following conditions shall be met:

- .1** cargo vapour-sampling pipes shall be provided with flame arresters. Cargo vapours samples shall be vented to the atmosphere through a special discharge pipe located in a safe space;
- .2** cargo vapour-sampling pipes shall be provided with shut-off valves or similar arrangements to preclude communication with gas-dangerous spaces;
- .3** fittings providing passage of the cargo vapour-sampling pipes through the gastight bulkhead which separate gas-safe and gas-dangerous zones, shall be of the approved type and have the same fire resistance level as the bulkhead;
- .4** instruments and equipment for gas analyzing shall be housed in a special hermetically sealed steel cabinet. One measuring point shall be located inside the cabinet. Where the concentration of dangerous gases inside the cabinet reaches a value which is above 30 % of the lower flammability limit, supply of the cargo vapour to the gas analyzer is to be automatically stopped;
- .5** where it is impossible to fit a cabinet with instruments and equipment on the gastight bulkhead the cargo vapour-sampling pipes shall be as short as possible, made of steel or equivalent material and have no detachable connections, except for the connections with the cabinet and valves mentioned in [5.3.2](#).

5.4 Arrangement of fixed vapour sampling devices shall be determined with consideration for the vapour density and reduction of concentration due to purging and ventilation of spaces.

5.5 Pipes going from the fixed vapour sampling devices shall not be led through gas-safe spaces, except for the cases where this is permitted by 2.3.

5.6 In spaces not normally entered, situated within the cargo area, use of portable gas analyzers with devices for external connection thereof is permitted.

5.7 When toxic-vapour detection equipment is not available for some products which require such detection as indicated in Part XI "Summary of Technical Requirements", the Register may exempt the ship from the requirement, provided the number of breathing apparatus is increased (refer to 5.1.15.2, Part VI "Fire Protection" of the Rules for the Classification). An entry to this effect shall be made on the Certificate of Fitness for the Chemical Tanker and attention shall be drawn to the provisions of 4.1.2 of Annex 1.

6 ALARM SYSTEMS

6.1 Alarm systems shall meet the requirements of Part XI "Summary of Technical Requirements" of these Rules, as well as 2.4, Part XV "Automation" of the Rules for the Classification.

6.2 Cargo tanks intended for carriage of cargoes for which references to Part XI "Summary of Technical Requirements" shall be fitted with high level alarm operating in CCR and MCS, be independent of the alarms required by [2.1](#) and [2.2](#) and indicate that liquid level in the cargo tank approaches the normal full condition.

6.3 When carrying cargoes for which the requirement for a tank overflow control is made, a tankoverflow-control system shall be provided. This system shall:

- .1** come into operation when the normal tank loading procedures fail to stop the tank liquid level exceeding the normal full condition;
- .2** give a tank-overflow alarm to the ship operator of CCR; and
- .3** provide an agreed signal for sequential shutdown of onshore pumps and for valves and of the ship cargo valves. The signal, as well as pump and valve shutdown, may be dependent on the operator intervention.

The use of shipboard automatic closing valves on cargo loading pipe may be permitted only when specific approval has been obtained from the administration of the loading port.

6.4 The system required under [6.3](#) shall be independent of devices referred to in [2.1](#), [2.2](#) and [6.2](#).

6.5 Arrangements shall be provided to test the level alarm required under [6.2](#) and [6.3](#) prior to loading.

6.6 MCS and CCR shall be provided with alarms giving signals to indicate the following conditions:

- .1** power failure on any system essential for cargo-handling operation;
- .2** failure of mechanical ventilation system in cargo tanks;
- .3** submersible pumps are out of service;
- .4** overheating of cargo (for each grade of cargo) where a reference to this item is made in Part XI "Summary of Technical Requirements";
- .5** overflow.

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