

RULES

FOR THE CLASSIFICATION AND CONSTRUCTION OF HIGH-SPEED CRAFT

PART VIII SYSTEMS AND PIPING

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RULES FOR THE CLASSIFICATION AND CONSTRUCTION OF HIGH-SPEED CRAFT

Rules for the Classification and Construction of High-Speed Craft of Russian Maritime Register of Shipping (RS, the Register) have been approved in accordance with the established approval procedure and come into force on 1 March 2023.

The present edition of the Rules is based on the 2018 edition taking into account the amendments developed immediately before publication.

The procedural requirements, unified requirements, unified interpretations and recommendations of the International Association of Classification Societies (IACS) and the relevant resolutions of the International Maritime Organization (IMO) have been taken into consideration.

The Rules are published in the following parts:

- Part I "Classification";
- Part II "Hull Structure and Strength";
- Part III "Equipment, Arrangements and Outfit";
- Part IV "Stability";
- Part V "Reserve of Buoyancy and Subdivision";
- Part VI "Fire Protection";
- Part VII "Machinery Installations";
- Part VIII "Systems and Piping";
- Part IX "Machinery";
- Part X "Boilers, Heat Exchangers and Pressure Vessels";
- Part XI "Electrical Equipment";
- Part XII "Refrigerating Plants";
- Part XIII "Materials";
- Part XIV "Welding";
- Part XV "Automation";
- Part XVI "Live-Saving Appliances";
- Part XVII "Radio Equipment";
- Part XVIII "Navigational Equipment";
- Part XIX "Signal Means";
- Part XX "Equipment for Pollution Prevention";
- Part XXI "Craft for Personnel Transportation".

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 The requirements of 1.2 – 1.6, Sections 2, 3, 4, 5, 20, 21, Part VIII "Systems and Piping" of the Rules for the Classification and Construction of Sea-Going Ships¹ shall be met as far as they are applicable.

1.2 Fluid systems shall be constructed and arranged so as to ensure a safe and adequate flow of fluid at a prescribed flow rate and pressure under all conditions of craft operation. The probability of a failure in any one fluid system, causing damage to the electrical system, a fire or an explosion shall be extremely remote.

1.3 The maximum allowable working pressure in any part of the fluid system shall not be greater than the design pressure, having regard to the allowable stresses in the materials. Where the maximum allowable working pressure of a system component, such as a valve or a fitting, is less than that calculated for the pipe or tubing, the system pressure shall be limited to the lowest of the component maximum allowable working pressures. Every system component that can be exposed to pressures higher than the system's maximum allowable working pressure shall be safeguarded by appropriate relief devices.

1.4 Pipes shall be capable to withstand prolonged exposure to vibration.

1.5 Pipes shall be provided with arrangements for drainage and purging of the conveyed liquid.

1.6 Tanks and piping shall be pressure-tested to a pressure that will assure a safety margin in excess of the working pressure of the item. The test on any storage tank shall take into account any possible static head in the overflow condition and the dynamic forces arising from craft motions.

Securing devices and foundations of the tanks and reservoirs shall be designed for the same loads.

1.7 Tanks containing oil fuel and other flammable fluids shall be separated from passenger, crew and baggage compartments by vapour-proof enclosures or cofferdams which are suitably ventilated and drained.

Tanks for fluids with a flashpoint not less than 60 °C may be located within such areas provided the tanks are made of steel or other equivalent material (refer to 1.2, Part VI "Fire Protection" of the Rules for the Classification).

The use of aluminium in lubricating oil sump tanks for engines, or in lubricating oil filter housings fitted integral with the engines, is accepted.

1.8 Pipes and valves and couplings of the systems conveying oil fuel and other flammable fluids under pressure shall be arranged as far from hot surfaces, electrical appliances and other potential sources of ignition as is practicable. They shall be located, shielded or protected with suitable enclosures so that the likelihood of fluid leakage coming into contact with such sources of ignition is kept to a minimum. The number of joints in such piping systems shall be kept to a minimum. Flexible pipes carrying flammable fluids shall be of an approved type.

This requirement is also applicable to air intakes of engine installations.

1.9 Pipes conveying flammable fluids, including oil fuel, lubricating oils, hydraulic and thermal oils located in machinery spaces and spaces containing sources of ignition shall be made of steel or other material meeting the Register requirements in respect of strength and fire integrity, having regard to the working pressure and the spaces in which they are installed. Wherever practicable, the use of flexible pipes shall be avoided.

1.10 Fuel oil, lubricating oils and other flammable oils shall not be carried forward of public spaces and crew accommodation.

¹ Hereinafter referred to as "the Rules for the Classification".

1.11 Cooling systems shall be adequate to maintain all lubricating and hydraulic fluid temperatures within the limits recommended by manufacturers under all intended conditions of craft operation.

1.12 Materials used in piping systems shall be compatible with the conveyed medium and shall be fire resisting where necessary.

1.13 Use of pipes made of aluminium alloys may be permitted in systems with non-combustible fluids and temperatures of not greater than 150 °C.

1.14 Pipelines made of plastics shall meet the requirements of Section 3, Part VIII "Systems and Piping" of the Rules for the Classification.

2 BILGE SYSTEM

2.1 The requirements of 7.1.3, 7.1.5, 7.2.2, 7.2.4, 7.3.6 to 7.3.8, 7.4.3, 7.4.5, 7.4.8, 7.6, 7.8 – 7.12, 7.14, Part VIII "Systems and Piping" of the Rules for the Classification shall be met.

2.2 Arrangements shall be made for draining any watertight compartment other than compartments intended for permanent storage of liquid.

Drainage arrangements for some compartments may be omitted provided it will be demonstrated that the safety of the craft will not be impaired with the particular compartment flooded.

Bilge wells shall be of sufficient capacity and arranged in each watertight compartment near side plating.

2.3 The system shall be capable to provide drainage under all possible values of list and trim after the craft has sustained the damage postulated in 4.3, Part V "Reserve of Buoyancy and Subdivision".

2.4 The bilge system shall be designed so as to prevent water flowing from one compartment to another.

2.5 The necessary valves for controlling the bilge suctions shall be capable of being operated from the positions above the datum. All distribution boxes and manually operated valves shall be located in positions, which are accessible under ordinary circumstances.

The spindles of the sea inlet valves shall extend well above the machinery space floor plates.

2.6 All bilge suction piping up to the connection to the pumps shall be independent of other piping.

2.7 For category B passenger crafts at least three and for category A crafts at least two power-operated bilge pumps connected to the bilge main shall be provided. One of them may be driven by the propulsion machinery.

Alternatively, the use of submersible pumps meeting the requirements of [2.12](#) is allowed.

At least one of the required bilge pumps shall be available for use under all conditions of flooding which the craft is required to withstand. For this purpose:

.1 at least one of the pumps shall be of a submersible type driven from an emergency source of power;

.2 the bilge pumps and their sources of power shall be so distributed throughout the length of the craft that at least one undamaged pump and source of power in an undamaged compartment will be available.

On multihull crafts, each hull shall be provided with at least two bilge pumps.

2.8 On cargo crafts at least two power pumps shall be provided, one of which may be driven by the main engine.

Alternatively, the arrangements in accordance with the requirements of [2.12](#) are allowed.

On multihull crafts, each hull shall be provided with at least two power pumps, unless a bilge pump in one hull is capable of pumping bilge in the other hull. At least one pump in each hull shall be an independent power pump.

2.9 Distribution boxes, cocks and valves in connection with the bilge system shall be so arranged that, in the event of flooding, one of the bilge pumps may be operative in any compartment. In addition, damage to a pump or its pipe connecting to the bilge main shall not put the bilge system out of action. When, in addition to the main bilge pumping system, an emergency bilge pumping system is provided, it shall be independent of the main system and so arranged that a pump is capable of operating in any compartment under flooding conditions as specified in [2.3](#). In that case only the valves necessary for the operation of the emergency system need be capable of being operated from above the bulkhead deck.

2.10 All cocks and valves referred to in [2.5](#), which can be operated from above the bulkhead deck, shall have their controls at their place of operation clearly marked and shall be provided with means to indicate whether they are open or closed.

2.11 For crafts provided with a bilge main with individual pumps, the total capacity of bilge pumps for each pump shall not be less than 2,4 times the capacity of the pump based on the necessity to pump out the water through the required bilge main at a rate at least 2 m/s.

The diameter (d) of the bilge main shall be calculated according to the following formula, except that the actual internal diameter of the bilge main may be rounded off to the nearest size of a recognized standard:

$$d = 25 + 1,68\sqrt{L(B + D)} \quad (2.11)$$

Where d = the internal diameter of the bilge main, in mm;
 L = the length of the craft, in m;
 B = for monohull craft, the breadth of the hull, in m; for multihull craft, the breadth of a hull at or below the design waterline, in m;
 D = the moulded depth of the craft measured to the top of the upper deck, in m.

Dimensions of suction branches shall comply with the requirements of 7.2.1 and 7.2.2, Part VIII "Systems and Piping" of the Rules for the Classification but shall not be less than 25 mm. Suction branches shall be provided with effective strainers.

2.12 For crafts where a bilge main is not provided at least one fixed submersible pump shall be provided for each space. In addition, at least one portable pump shall be provided supplied from the emergency supply source, for use in individual spaces. The capacity of each submersible pump Q_n , m³/h, shall be not less than

$$Q_n = Q/(N - 1) \quad (2.12)$$

where N = number of submersible pumps;
 Q = total capacity.

The minimum capacity shall be at least 8 m³/h.

2.13 The power operated self-priming bilge pumps may be used for other duties such as fire fighting or general service but not for pumping fuel or other flammable liquids.

2.14 An emergency bilge suction shall be provided for each machinery space containing a propulsion prime mover. This suction shall be led to the largest power water pump available in the machinery space.

2.15 Spaces located above the upper deck shall be drained if penetration of water through windows, doors and other openings substantially affect stability and buoyancy of the craft. The spaces may be drained directly overboard through scuppers fitted with non-return valves.

2.16 Any space including buoyancy compartments for which bilge pumping arrangements are required shall be provided with a bilge alarm.

2.17 In view of the serious loss of stability, which might arise due to accumulation of large quantities of water accumulating on the deck or decks consequent to the operation of the fixed water main fire-extinguishing system, additional means of drainage shall be provided in the spaces served by this system. The capacity of the bilge or drainage arrangements available shall provide removal of not less than 125 % of the amount of water, which may result from operation of the water fire extinguishing systems.

2.18 Where watertightness or weathertightness shall be maintained, scuppers shall be arranged so that they can be operated from outside the protected space.

2.19 Non-return valves shall be fitted in the following bilge pumping components:

- .1 bilge valve distribution manifolds;
- .2 bilge suction hose connections where fitted directly to the pump or to the main bilge suction pipe;
- .3 direct bilge suction pipes and bilge pump connections to main bilge suction pipe.

3 BALLAST SYSTEM

3.1 The requirements of 8.1.1, 8.1.2, 8.1.5, 8.2, Part VIII "Systems and Piping" of the Rules for the Classification shall be met.

3.2 Water ballast shall not in general be carried in tanks intended for oil fuel.

3.3 Where a fuel-transfer system is used for ballast purposes, the system shall be isolated from ballast system and meet the requirements for oil fuel systems.

4 VENTILATION SYSTEMS

4.1 The requirements of 12.1 to 12.3, 12.5.1, 12.6 to 12.10, Part VIII "Systems and Piping" of the Rules for the Classification shall be met.

4.2 The main inlets and outlets of all ventilation systems shall be capable of being closed from outside the spaces being ventilated. In addition, such openings to areas of major fire hazard shall be capable of being closed from a continuously manned control station.

4.3 All ventilation fans shall be capable of being stopped from outside the spaces which they serve, and from outside the spaces in which they are installed. Ventilation fans serving the areas of major fire hazard shall be capable of being operated from a continuously manned control station.

Means provided for stopping the mechanical ventilation to the machinery space shall be separated from the means provided for stopping ventilation of other spaces.

4.4 Areas of major fire hazard and spaces serving as assembly stations shall have independent ventilation systems and ventilation ducts. Ventilation ducts for areas of major fire hazard shall not pass through other spaces, unless they are contained within a trunk or in an extended machinery space or casing insulated in accordance with Tables 2.5.2 and 2.6.2, Part VI "Fire Protection"; ventilation ducts of other spaces shall not pass through areas of major fire hazard.

Ventilation outlets from areas of major fire hazard shall not terminate within a distance of 1 m from any control station, evacuation station or external escape route. In addition, exhaust ducts from galley ranges shall be fitted with:

.1 a grease trap readily removable for cleaning unless an alternative approved grease removal system is fitted;

.2 a fire damper located in the lower end of the duct, which is automatically and remotely operated, and in addition a remotely operated fire damper located in the upper end of the duct;

.3 a fixed means for extinguishing a fire within the duct;

.4 remote control arrangements for shutting off the exhaust and supply fans, for operating the fire dampers mentioned in [4.4.2](#) and for operating the fire-extinguishing system, which shall be placed in a position close to the entrance to the galley. Where a multi-branch system is installed, means shall be provided to close all branches exhausting through the same main duct before an extinguishing medium is released into the system; and

.5 suitably located hatches for inspection and cleaning.

4.5 Where a ventilation duct passes through a fire-resisting division, a fail-safe automatic closing fire damper of a type approved by the Register shall be fitted adjacent to the division.

The duct between the division and the damper shall be of steel or other equivalent material and insulated to the same standard as required for the fire-resisting division.

The fire damper may be omitted where ducts pass through spaces surrounded by fire-resisting division without serving those spaces, provided that the duct has the same structural fire protection time as the divisions it penetrates. Where a ventilation duct passes through a smoke-tight division, a smoke damper shall be fitted at the penetration unless the duct, which passes through the space, does not serve that space.

4.6 Where ventilation systems penetrate decks, arrangements shall be such that the effectiveness of the deck in resisting fire is not thereby impaired. Precautions shall be taken to reduce the likelihood of smoke and hot gases passing from one between-deck space to another through the ventilation system.

4.7 All dampers fitted on fire-resisting or smoke-tight divisions shall also be capable of being manually closed from each accessible side of the division in which they are fitted, except for those dampers fitted on the ducts serving spaces not normally manned such as stores and toilets that may be manually operated only from outside the served spaces. All dampers shall also be capable of being remotely closed from the continuously manned control station.

4.8 There shall be provided an effective mechanical ventilation system for special-category spaces sufficient to give at least 10 air changes per hour when navigating and 20 air changes per hour at the quayside during vehicle loading and unloading operations. Ventilation system for such spaces shall be entirely separated from other ventilation systems and shall operate at all times when vehicles are in such spaces. Ventilation ducts serving special-category spaces and ro-ro spaces capable of being effectively sealed shall be separated for each such space. The system shall be capable of being controlled from a position outside such spaces.

Ventilation shall be such as to prevent air stratification and the formation of air pockets.

Means shall be provided to indicate in the operating compartment any loss or reduction of the required ventilating capacity.

Arrangements shall be provided to permit a rapid shutdown and effective closure of the ventilation system in case of fire.

Ventilation ducts, including dampers, shall be made of steel or other equivalent material.

4.9 The ducts shall be made of non-combustible or fire-restricting material. Short ducts, however, may be of combustible materials subject to the following conditions:

- .1 their cross-section does not exceed 0,02 m²;
- .2 their length does not exceed 2 m;
- .3 they may only be used at the terminal end of the ventilation system;
- .4 they shall not be situated less than 600 mm from an opening in a fire-resisting or fire-restricting divisions;
- .5 their surfaces have low flame-spread characteristics.

4.10 The design of exhaust-gas operated heaters for ventilation air shall prevent exhaust gas from penetration into the ventilation air.

4.11 The ventilation arrangements shall be adequate to ensure uniform air exchange and to prevent the formation of air pockets.

4.12 Machinery spaces shall be adequately ventilated so as to ensure that when machinery therein is operating at full power in all weather conditions, including heavy weather, an adequate supply of air is maintained to the spaces for the safety and comfort of personnel and the operation of the machinery. Auxiliary machinery spaces shall be adequately ventilated appropriate for the purpose of those spaces. The ventilation arrangements shall be adequate to ensure that the safe operation of the craft is not put at risk.

4.13 The ventilation of machinery spaces shall be sufficient under all normal conditions to prevent accumulation of oil vapour.

4.14 The main passenger spaces shall be served by a ventilation system independent of the ventilation system of any other spaces. The ventilation fans of each zone in the public spaces shall be also capable of being independently controlled from a continuously manned control station.

4.15 Engine air intake systems shall provide sufficient air to the engine under all envisaged operating conditions and give adequate protection against ingress of foreign matter. Where appropriate, arrangements shall ensure that enclosed engine compartments are forcibly ventilated to the atmosphere before the engine can be started.

5 OIL FUEL SYSTEM

5.1 The requirements of 13.1.3, 13.1.4, 13.2.3, 13.2.4, 13.3 to 13.7, 13.8.2, 13.8.4, 13.9.2, 13.9.3, 13.9.7, 13.9.8, 13.10, Part VIII "Systems and Piping", and 4.3, Part VII "Machinery Installations" of the Rules for the Classification shall be met. The equipment of the oil fuel system shall provide supply of oil fuel properly pre-treated and purified to the extent required for the engine involved.

Fuel to the main engines shall be supplied from two tanks for each fuel type. For cargo craft of less than 500 gross tonnage or length below 24 m, this requirement shall be considered recommendation.

5.2 Location of fuel tanks shall be in accordance with [1.7](#). Each oil fuel tank which, if damaged, would allow oil to escape from a storage, settling, or daily service tank shall be fitted with a cock or valve installed directly on the tank capable of being closed from a safe position outside the space concerned in the event of a fire occurring in the space in which such tanks are situated.

5.3 Oil fuel pipes shall be made of steel or other equivalent material meeting the requirements of the Register in respect of their strength and fire integrity.

5.4 The use of flexible pipes shall be avoided but, if used, they shall meet the requirements of 2.5, Part VIII "Systems and Piping" of the Rules for the Classification.

5.5 Arrangements shall be made to minimize the quantity of oil fuel which remains in pipes, filters, etc. located in machinery spaces when not in use.

5.6 All parts of oil fuel pipes containing heated oil fuel under pressure exceeding 0,18 MPa shall be located in open, adequately illuminated spaces.

5.7 Means of ascertaining the amount of oil fuel contained in any oil fuel tank shall meet the requirements of [11.4](#) and [11.5](#).

5.8 In each craft where oil fuel with a flash point below 43 °C is used, the following additional arrangements shall be made:

.1 tanks for the storage of such oil fuel shall be located outside any machinery space and at a distance not less than 760 mm inboard from the shell side and bottom plating and from decks and bulkheads;

.2 air pipe ends shall be fitted with flame arresters;

.3 spaces in which oil fuel tanks are located shall be mechanically ventilated, using exhaust fans providing not less than six air changes per hour. Fans shall be such as to avoid the possibility of ignition of flammable gas-air mixtures. Suitable flame arresters shall be fitted over inlet and outlet ventilation openings. The outlets for such exhausts shall be discharged to a safe position. "No Smoking" signs shall be posted at the entrances to such spaces;

.4 electrical equipment used shall meet the requirements of Part XI "Electrical Equipment";

.5 means of ascertaining the amount of oil fuel shall comply with the requirements of [11.4](#) and [11.5](#);

.6 a fixed vapour-detection system shall be installed in each space through which fuel lines pass, with alarms provided at the continuously manned control station;

.7 every fuel tank shall be provided with "savealls" or gutters which would catch any fuel which may leak from such tank;

.8 vessel-to-shore fuel connections shall be of a closed type and suitably grounded during bunkering operations.

5.9 Provision shall be made to prevent overpressure in any fuel tank or in any part of the oil fuel system, including the filling pipes. Any relief valves and air or overflow pipes shall discharge to a safe position and, for oil fuel with a flashpoint less than 43 °C, shall terminate with flame arresters.

5.10 The equipment used in the oil fuel system shall meet the following additional requirements:

.1 where daily service oil fuel tanks are filled automatically or by remote control, means shall be provided to prevent overflow spillages;

.2 other equipment, which treats oil fuel automatically, such as oil fuel purifiers, whenever practicable, shall be installed in a special place that shall have arrangements to prevent overflow spillages;

.3 where daily service oil fuel tanks or settling tanks are fitted with heating arrangements, a high- temperature alarm shall be provided if the flashpoint of the oil can be reached due to failure of the thermostatic control.

6 LUBRICATING OIL SYSTEM

6.1 The requirements of 14.1, 14.2, 14.5.1, 14.5.2, 14.5.4 to 14.5.6, 14.6, 14.7, Part VIII "Systems and Piping" of the Rules for the Classification shall be met and also of [1.7 to 1.10](#) and [5.10](#) of the present Part.

6.2 The arrangements for the storage, distribution and utilization of oil used in pressure lubrication systems shall be such as to ensure the safety of craft and persons on board. The arrangements made in machinery spaces and, whichever practicable, in auxiliary machinery spaces shall at least comply with the requirements of [5.1 to 5.7](#) and [5.9](#) except that:

.1 this does not preclude the use of sight-flow glasses in lubricating systems provided they are shown by test to have a suitable degree of fire resistance;

.2 sounding pipes may be permitted in machinery spaces if fitted with appropriate means of closure;

.3 lubricating oil storage tanks with a capacity of less than 500 l may be permitted without remote operated valves.

7 COMPRESSED AIR SYSTEM

7.1 The requirements of 16.1.3 – 16.1.6, 16.2.2, 16.3, Part VIII "Systems and Piping" of the Rules for the Classification shall be met.

8 EXHAUST GAS SYSTEM

8.1 The requirements of Section 11, Part VIII "Systems and Piping" of the Rules for the Classification shall be met.

8.2 Exhaust gas systems shall be arranged so that any possibility of exhaust gas penetration into the spaces where people may be present, as also into the air-conditioning system and air intakes of engines is kept to a minimum. Exhaust systems, as a rule, shall not be discharged into air-cushion intakes.

8.3 Exhaust gas pipes shall be arranged so that any possibility of fire is precluded. For that purpose, all structures located in vicinity of the exhaust gas system as well as those which are likely to be exposed to exhaust gases under all service conditions shall be made of non-combustible materials or properly insulated.

8.4 Gas-turbine engine exhausts shall be arranged that hot exhaust gases are directed away from the areas to which personnel have access, either on board the craft or in the vicinity of the craft when berthed.

8.5 Silencers and spark arresters which can be split for inspections and cleaning may be made without inspection holes.

8.6 Adequate arrangements shall be made to prevent water from flooding the space or entering the engine exhaust manifold.

Pipes through which exhaust gases are discharged through the hull in the vicinity of the waterline shall be fitted with erosion-/corrosion-resistant shut-off flaps or other devices on the shell or pipe end.

9 COOLING WATER SYSTEM

9.1 In case of one main engine, fresh and sea water cooling systems shall be provided with stand-up pumps with a capacity not less than that of the main pumps. One stand-by pump for fresh and sea water with an independent drive may be used. In this case, arrangements shall be made to prevent mixing of fresh and sea water.

For engines which may be cooled with sea water the stand-by fresh water pump may be omitted.

For two and more engines stand-by pumps are not required.

9.2 Sea water cooling suction pipes shall be provided with filters which can be cleaned when the craft is running in the displacement mode.

9.3 Arrangements shall be provided to ensure that, in the event of failure in the cooling system, it is rapidly detected and alarmed (visual and audible) and means installed to minimize the effects of such failures on machinery serviced by the system.

10 HYDRAULIC SYSTEM

10.1 The requirements of Section 7, Part IX "Machinery" of the Rules for the Classification shall be met.

10.2 A working medium of hydraulic systems shall meet the requirements of 2.3.11, Part XV "Automation" of the Rules for the Classification.

10.3 Hydraulic system shall be capable to stand up to additional pressures arising due to likely hydraulic impacts.

10.4 Provision shall be made for cleaning filters without interruption of the system operation.

10.5 Redundant pumps shall be provided in hydraulic systems of the craft with automatic stabilization systems, having a distinguishing mark **AUTstab** in the class notation.

10.6 Arrangements for storage, distribution and use of flammable hydraulic oils shall ensure safety of the craft and occupants on board. In places where there are sources of ignition, such arrangements shall at least comply with the requirements in [1.7](#), [5.2](#) and [11.3](#), and in respect of strength and construction with those of [5.3](#) and [11.2](#).

11 AIR, OVERFLOW AND SOUNDING PIPING

11.1 Each tank intended for the storage of liquid, each filled cofferdam, as well as ice and sea inlet boxes shall have air pipes vented to the atmosphere or other arrangements shall be made to prevent excessive pressure or vacuum in tanks and their associated pipelines.

11.2 Any safety valves, air or overflow pipes of oil fuel tanks shall direct fuel and vapour-air mixture to a safe position. Where the flash point of fuel is less than 43 °C the outlets of pipes shall be protected by flame-arresting fittings approved by the Register.

11.3 Each tank intended for the storage of liquid, cofferdams and void spaces with bilge connections, as well as bilges and bilge wells in spaces which are not accessible at all times shall be provided with sounding pipes or other sounding arrangements approved by the Register.

11.4 Upper ends of sounding pipes of fuel and lubricating oil tanks shall not be led to spaces which may present risk of ignition of leakage from sounding pipes. Leading of sounding pipes of fuel tanks to accommodation and service spaces is prohibited. Upper ends of sounding pipes shall be provided with appropriate shut-off devices. Arrangements shall be made to prevent spillage during the loading of fuel.

11.5 Other sounding arrangements for liquid oil fuel shall be permitted, if such arrangements do not require penetration below the top of the tank and their failure or overfilling of tanks will not permit release of fuel.

11.6 The use of cylindrical gauge glasses is prohibited.

Level indicators fitted with transparent inserts may be used in oil fuel and lubricating oil tanks in cargo craft. The transparent inserts shall be made of flat glass or shockproof plastics, which do not lose transparency under the action of oil fuel, and protected against damage. Self-closing cocks shall be fitted between level indicators and tanks.

For lubricating oil tanks with a capacity under 500 l installation of self-closing cocks is not compulsory.

12 THERMAL LIQUID SYSTEMS

12.1 Arrangements for storage, distribution and use of flammable heat transfer agents used under pressure shall ensure safety of the craft and occupants on board. In places where sources of ignition are present, such arrangements shall comply with the requirements of [1.7](#), [5.2](#) and [11.3](#), and as regards strength and construction with those of [5.3](#) and [11.2](#).

12.2 Thermal liquid systems shall meet the applicable requirement of Section 20, Part VIII "Systems and Piping" of the Rules for the Classification.

Russian Maritime Register of Shipping

**Rules for the Classification and Construction of High-Speed Craft
Part VIII
Systems and Piping**

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