RUSSIAN MARITIME REGISTER OF SHIPPING

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RULES

FOR THE CLASSIFICATION AND CONSTRUCTION OF PLEASURE CRAFT

PART VI

AUTOMATION

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RULES FOR THE CLASSIFICATION AND CONSTRUCTION OF PLEASURE CRAFT (PART VI)

The present version of the Rules for the Classification and Construction of Pleasure Craft of Russian Maritime Register of Shipping (RS, the Register) has been approved in accordance with the established approval procedure and come into force on 1 November 2025.

The present version is based on the version dated 1 January 2018 taking into account the amendments and additions developed immediately before publication (refer to the Revision History).

REVISION HISTORY[1]

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

[1] With the exception of amendments and additions introduced by Rule Change Notices (RCN), as well as of misprints and omissions.

1 GENERAL

1.1 APPLICATION AND BASIC REQUIREMENTS

1.1.1 The requirements of this Part of the Rules for the Classification and Construction of Pleasure Craft [1] apply to automated and remotely controlled machinery installations of the craft for which an automation mark **AUT** to be added to the classification notation is assigned (see 2.2.6, Part I "Classification").

1.1.2 The requirements of this Part shall be complied with where the machinery installation of a craft is adapted to operation without permanent attendance of personnel in machinery spaces.

The requirements of this Part do not cover craft with locally controlled outboard engines.

1.1.3 The mechanical, electrical and electronic equipment, as well as components of the automation systems and machinery themselves shall meet the requirements of relevant parts of these Rules.

1.1.4 The requirements of this Part cover the automation equipment according to 1.3.2, as well as the cases when a craft, as a whole, is not assigned the mark **AUT** in the class notation.

[1] Hereinafter referred to as "these Rules".

1.2 DEFINITIONS AND EXPLANATIONS

1.2.1 For the purpose of this Part, the following definitions and explanations have been adopted.

Automated machinery plant means a plant fitted up with automated control of main and auxiliary machinery and their associated systems, remote monitoring, alarm and indication facilities.

Remote automated control system means a control system whereby a desired operating mode of a machinery can be set up from a remote control station with one move of control (e.g. handle) followed by automatic execution of all intermediate operations.

Remote control system means a control system which, when being used for executing intermediate operations, needs an Operator's action to manipulate controls located at the remote control station.

Alarm system means equipment for signaling whenever the controlled parameters reach the preset limit values, or deviations of machinery and associated systems from normal working ranges occur.

Safety system means equipment to automatically influence, in a specific way, the operation of machinery under control in order to prevent an emergency or limit its consequences.

Indication system means equipment providing visual information on the values of certain physical parameters or on change of certain conditions in machinery and systems.

Local control station means a control station fitted with controls, indicators and means of communication, intended for control of a machinery and located in proximity to, or directly on, the machinery.

Automation device means a part of automation system comprising components, which form a structural and functional unity.

Automation component means a structurally independent item (e.g. amplifier, sensor, relay, logic element) used in automation devices and systems.

1.3 SCOPE OF TECHNICAL SUPERVISION

1.3.1 General provisions concerning classification procedure, technical supervision of craft being designed or constructed, manufacture of equipment and components thereof, surveys, as well as requirements for technical documentation on the craft, as a whole, to be submitted to the Register for review and approval may be found in Part I "Classification" of these Rules and in the General Regulations for the Classification and Other Activity.

1.3.2 Subject to technical supervision, as applied to a craft, during manufacture and in service are automation components, devices and systems of the following:

.1 main machinery and propellers;
.2 electric power plants;
.3 auxiliary services machinery;
.4 auxiliary boilers;
.5 alarm systems;
.6 other systems as required by the Register.

1.4 TECHNICAL DOCUMENTATION

1.4.1 For each item of automation equipment listed under 1.3.2, the technical documentation to be submitted to the Register shall be as follows:

.1 description of operational principle including technical parameters, scope of automated operations to be executed, operating conditions and other data;

.2 general arrangement and layout;

.3 functional diagrams;

.4 specification with indication of the materials used and accessories, where all used components and devices with their technical characteristics are shown;

.5 list of monitored parameters for the alarm and safe ty systems;

.6 test program;

.7 list of spare parts.

1.4.2 The technical documentation pertinent to automation, incorporated into the technical design documentation, shall be submitted to the Register for review prior to craft construction, in the scope stipulated in Part I "Classification".

2 DESIGN OF AUTOMATION EQUIPMENT

2.1 AUTOMATED MAIN MACHINERY

2.1.1 Automated main machinery shall be provided with:

.1 devices for remote automated control from the wheelhouse;

.2 visual alarm to indicate the availability of the main machinery for service;

.3 alarms to indicate malfunction in the control system and the limiting values of monitored parameters;

.4 automatic safety devices activated when the monitored parameters fall beyond the limits of the allowed parameters being of potential menace of accident, as well as an alarm system to give warning signal at operation of safety devices;

.5 a device to transfer control of the main machinery from automatic to manual mode from a local control station regardless of the position of handle at the remote control station.

2.1.2 Hydraulic and pneumatic control systems shall be supplied from two sources. The second source shall be connected automatically upon pressure loss with application of an alarm signal.

2.1.3 Electric and electronic control systems shall be supplied from both the main and emergency power sources. Power circuits for control systems shall be independent of the power circuits for safety and alarm systems.

Control systems of the main machinery having power of 220 kW and less may be supplied from the attached generators and starting accumulator batteries floating on the generators.

2.1.4 In installations with two or more engines driving one shaft, the safety system shall provide for automatic shut-down of the faulty engine so that the rest keep the craft running and maneuvering.

Protection system of main engines, except for overspeed protection, shall be disconnectable, with the signal of disconnection being activated in the wheelhouse and at the control stations of machinery space.

2.1.5 A device, independent of the control and alarm systems, shall be provided for emergency shut-down of the main engine.

2.1.6 Failure of remote control system of the main machinery shall not cause an increase in the craft speed, change in the propeller thrust direction, or inadvertent starting of the main machinery, and also immediate stop of the engine from the remote control station shall be made possible.

2.1.7 If malfunctions occur in power system for the control systems, changeover from one power supply source to another shall be effected manually from the control station, or automatically depending on the system functionality.

2.1.8 In craft with main machinery having power of 220 kW and less, with attached auxiliaries, the composition of the monitoring, alarm and protection means may be reduced.

2.1.9 For engines with power of 220 kW and less, use of the remote control systems may be allowed.

2.1.10 For auxiliary machinery, which are required to operate under definite service conditions only, provision may be made for control from the wheelhouse with application of alarm signal and indication of starting thereof, if needed.

2.1.11 Pressure and temperature in essential systems of the machinery installation shall be controlled automatically.

2.2 AUTOMATED ELECTRIC POWER PLANTS

2.2.1 The automated electric power plants shall be provided with the control devices ensuring remote starting of generator sets with automatic or remote synchronization, taking over and load sharing.

2.2.2 In ships where electrical power is normally supplied by one generator, in case of its failure and de-energization of the main switchboard, provision shall be made for the following:

.1 automatic starting of stand-by diesel generator and its connection to busbars of the main switchboard within 30 s;

.2 automatic connection, in the necessary sequence, of essential devices ensuring propulsion, without any over loading of the electric power plant.

2.2.3 Indicators shall be provided at the electric power plant control stations to warn that the generator sets are ready to start immediately (automatically).

2.2.4 Where the generator driven by the propulsion plant (shaft generator) and diesel generator are not intended to operate in parallel, the system of connections shall be so interlocked as to prevent their possible switching-on for parallel operation.

2.2.5 Monitored parameters of the automatic electric power plants (except emergency), measuring points, limiting values of parameters and types of automatic protection and parameter indication are given in Table 2.9.7.

2.3 AUTOMATED BOILER PLANTS

2.3.1 The requirements of this Chapter cover boiler plants with oil-burning installations.

2.3.2 Steam boilers shall be provided with automatic feed water and steam pressure governors.

2.3.3 Provision shall be made for a remote shut-down of the boiler plants from the control station where continuous watch is kept.

2.3.4 As far, as the oil-burning installations are concerned, the oil supply to the burners shall be cut off automatically in the following cases:

.1 absence of flame for not more than 5 s from the moment the oil supply begins;

.2 degradation of parameters of air intended for fuel oil atomization;

.3 insufficient pre-ventilation of the burner furnace.

2.3.5 Starting of boiler plants from cold condition and after being shut down by protection system shall be possible from the local control station only.

2.3.6 Automation system of exhaust gas water heating boilers operating under pressure shall provide for automatic changeover of the device which regulates direction of exhaust gas flow through the boiler or directly into the atmosphere, depending on temperature in the boiler.

2.4 AUTOMATED BILGE PLANTS OF MACHINERY SPACES

2.4.1 Depending on the water level in wells, the automated bilge plants shall put automatically the relevant bilge pumps in operation. Alarm to indicate pump operation shall be provided.

2.4.2 If, after the bilge pumps have been started, the water level in the bilge wells goes on rising or does not fall, an alarm shall be activated.

2.4.3 A separate sensor shall be provided to signal of the highest possible level, which would be independent of the sensors provided to control the bilge pumps.

2.5 AUTOMATED COMPRESSOR PLANTS

2.5.1 Starting air receivers, tyfon, as well as the amount of air to feed automation systems shall be replenished automatically.

For automated compressors, provision shall be also made for starting and stopping thereof from the wheelhouse.

2.5.2 Compressed air system shall be fitted up with automatic drainage devices.

2.5.3 Air compressors shall be automatically started when the pressure in air receivers drops by not more than 30 per cent of the nominal pressure, and shut down when the pressure reaches 97 to 103 per cent of the nominal one.

2.6 AUTOMATED PUMPING UNITS

2.6.1 Automated pump control system shall ensure automatic starting of standby pumps and changeover, as necessary, in systems, in case of pump failure or upon reaching the highest permissible deviations of parameters in essential circulation systems. Along with that, the alarm system shall actuate signal to warn of faulty pump and of standby pump starting.

2.6.2 The starting circuit of pumps having equal output shall make it possible to use each of them as the main one.

2.7 EQUIPMENT ARRANGEMENT IN WHEELHOUSE

2.7.1 Facilities shall be provided to effect remote control of main and auxiliary machinery and propellers.

2.7.2 Provision shall be made for independent emergency stop of main engine from the wheelhouse.

2.7.3 Alarm system shall be provided to warn of troubles to machinery and plants in machinery space. Provision shall be made for indicating means to show speed and direction of propeller rotation, as well as the pitch of CPP.

2.7.4 Provision shall be made for indicating means to show engagement/disengagement position of the coupling of the main machinery.

2.7.5 In the wheelhouse, provision shall be made for the following alarms:

"Water in machinery space", "Fire in machinery space", "Alarm system failure".

2.7.6 Control, indication and alarm devices in the wheelhouse shall be located on desks adapted for manipulation by one person.

The visual indicators shall be arranged in such a way as to prevent dazzling of the personnel and to be clearly seen in day-time.

Provision shall be made for dimming of the indicating system lamps.

2.7.7 In boats with open machinery space, open navigating bridge, with main machinery of total power less than 220 kW, outboard engines and mechanical remote control system, engines with sterndrives, the scope and list of the automation system facilities may be reduced after review of the technical documentation by the Register, as well as with regard to the experience of application of such equipment on the craft.

2.8 EQUIPMENT ARRANGEMENT IN MACHINERY SPACES

2.8.1 Local control station of the main machinery shall be provided.

2.8.2 Provision shall be made for a panel for alarms and indicators of parameters, arranged in the vicinity of the control station of the main machinery.

2.8.3 The controls of auxiliarities shall be installed in close proximity to the local control station of the main machinery.

2.8.4 For the main engines with power less than 220 kW, with mechanical remote control system, the local control stations and alarm panels may be dispensed with.

2.9 ALARM, PROTECTION AND INDICATION SYSTEMS OF MACHINERY INSTALLATION

2.9.1 The alarm system of the machinery installation shall give visual and audible signals if operating parameters fall beyond the allowable limits. In this case, the alarm signal shall not be activated when allowable deviations of the operating parameters are caused by maneuvering. Alarm shall be activated in the engine room and in wheelhouse.

2.9.2 Irrespective of the extent of automation and the monitoring order used for the machinery, the alarm system shall give visual and audible warning signals at:

.1 monitored parameters reaching predetermined limit values;

.2 operation of protection devices;

.3 power failure of particular automation systems;

.4 starting of emergency power sources.

The visual signals shall be given as flashing lights. After being accepted (acknowledged) the flashing light shall change to steady light. Canceling of a visual signal shall be only possible after the fault has been cleared.

2.9.3 In the crew's accommodation and service spaces, the engineer's alarm shall be activated for the call of the engineers to machinery space, which is activated manually, or automatically where an alarm system has not been acknowledged.

2.9.4 For machinery installations with main engines having power less than 220 kW, outboard engines and mechanical remote control system, engines with sterndrives, the range of alarm signals may be reduced after review of the technical documentation for control systems, as well as with regard to the experience of application of such equipment on the craft.

2.9.5 The protection systems of automated machinery shall be provided for those parameters only the deviations of which can lead to serious damage, complete failure of the machinery.

2.9.6 The indication system shall be so designed that the readings are displayed in units normally used for parameters, i.e. without recalculation.

2.9.7 Monitored parameters of machinery and systems, measuring points, limiting values of parameters and types of automatic protection and parameter indication shall be found in Table 2.9.7.

2.9.8 The Owner's Manual shall contain information on limiting values of parameters and types of protection and parameter indication.

Table 2.9.7

Nos.	Monitored parameter	Measuring point	Alarm for limiting values of parameters	Automatic protection	Indication of parameters in wheelhouse	Comments
1	**Main internal combustion engines**					
1.1	Lubricating oil pressure	At engine inlet	Min.	Engine shut-down	Continuous or on call	—
1.2	Imbricating oil temperature	At engine inlet	Max.	—	Continuous or on call	—
1.3	Lubricating oil pressure drop	Filter	Max.	—	Continuous or on call	—
1.4	Coolant pressure or flow	At engine outlet	Min.	Slow-down	Continuous or on call	—
1.5	Coolant temperature	At engine outlet	Max.	Slow-down	Continuous or on call	—
1.6	Coolant level	Expansion tank	Min.	—	—	For independent tank
1.7	Cooling sea water pressure or flow	Sea water cooling system	Min.	—	Continuous or on call	—
1.8	Exhaust gas temperature	Main pipe	Max.	—	—	—

Nos.	Monitored parameter	Measuring point	Alarm for limiting values of parameters	Automatic protection	Indication of parameters in wheelhouse	Comments
1.9	Starting air pressure	Before starting valve	Min.	—	—	—
1.10	Control air pressure	Engine control system	Min.	—	—	—
1.11	Fuel oil level	Daily service tank	Min.	—	—	—
1.12	Fuel oil leakage	From high-pressure piping	Presence of fuel oil	—	—	—
1.13	Engine speed		Max.	Engine shut-down	Continuous or on call	–
1.14	Power supply to remote automated control, alarm and safety systems	At inlet of systems	Failure of power supply	—	—	—
1.15	Oil pressure in CP-propeller hydraulic system	At filter outlet	Min.	—	Continuous or on call	—
1.16	CP-propeller hydraulic oil level	Header tank	Min.	—	—	—
2	**Reduction gear**					
2.1	Lubricating oil pressure	At reduction gear inlet	Min.	Engine shut-down	—	—
2.2	Lubricating oil temperature	In reduction gear	Max.	—	—	—
3	**Internal combustion engines for driving generators**					
3.1	Lubricating oil pressure	At engine inlet	Min.	Engine shut-down	—	—
3.2	Coolant pressure or flow	At engine inlet	Min.	—	—	—
3.3	Coolant temperature	At engine outlet	Max.	—	—	—
3.4	Engine speed	Limiting governor	Max.	Engine shut-down	—	—
4	**Electric installation**					
4.1	Voltage	Main switchboard	Min., max.	—	—	—
4.2	Insulation resistance	Main switchboard	Min.	—	—	—
5	**Starting compressors**					
5.1	Air temperature	At compressor outlet	Max.	Compressor shut-down	—	—
6	**Tanks**					
6.1	Leakage fuel oil level	Leakage fuel oil tank	Max.	—	—	—
6.2	Fuel oil level	Daily service tanks	Min.	—	—	—
6.3	Domestic waste and sewage water level	Tanks	Max.	—	—	—
7	**Bilge plants**					
7.1	Emergency water level	Bilge wells	Max.	—	—	Alarm signal is activated in wheelhouse

Nos.	Monitored parameter	Measuring point	Alarm for limiting values of parameters	Automatic protection	Indication of parameters in wheelhouse	Comments
8	**Miscellaneous**					
8.1	Safety system of boiler plant	Feeding unit	Failure	Boiler shut-down	—	—
8.2	Alarm system	Feeding unit	Failure	—	—	—
8.3	Protection system	Feeding unit	Failure	—	—	—

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