



RUSSIAN MARITIME REGISTER OF SHIPPING

CIRCULAR LETTER

No. 315-24-1919c

dated 06.04.2023

Re:

amendments to the Rules for the Classification and Construction of Sea-Going Ships, 2023, ND No. 2-020101-174-E

Item(s) of supervision:

dynamic positioning systems

Entry-into-force date:

01.05.2023

~~Cancels / amends / adds Circular Letter No.~~

~~dated~~

Number of pages: 1 + 5

Appendices:

Appendix 1: information on amendments introduced by the Circular Letter

Appendix 2: text of amendments to Part XV "Automation"

Director General

Sergey A. Kulikov

Text of CL:

We hereby inform that the Rules for the Classification and Construction of Sea-Going Ships shall be amended as specified in the Appendices to the Circular Letter.

It is necessary to do the following:

1. Bring the content of the Circular Letter to the notice of the RS surveyors, interested organizations and persons in the area of the RS Branch Offices' activity.
 2. Apply the provisions of the Circular Letter during review and approval of the technical documentation on ships (or products installed on board the ships) contracted for construction or conversion on or after 01.05.2023, in the absence of a contract, during review and approval of the technical documentation on ships (or products installed on board the ships) requested for review on or after 01.05.2023.
-

List of the amended and/or introduced paras/chapters/sections:

Part XV: paras 8.2.1, 8.10.4 and Chapter 8.15

Person in charge: Andrey V. Vinogradov 315

+7 (812) 605-05-17

"Thesis" System No. 23-56320

**Information on amendments introduced by the Circular Letter
(for inclusion in the Revision History to the RS Publication)**

Nos.	Amended paras/chapters/ sections	Information on amendments	Number and date of the Circular Letter	Entry-into-force date
1	Para 8.2.1	Definitions "Common element", "Cross connection" and "Technical system configuration (TSC)" have been introduced for DP systems	315-24-1919c of 06.04.2023	01.05.2023
2	Para 8.10.4	Requirements for Class 1 DP systems have been specified	315-24-1919c of 06.04.2023	01.05.2023
3	Chapter 8.15	New Chapter has been introduced containing requirements for development of FMEA for DP vessels	315-24-1919c of 06.04.2023	01.05.2023

RULES FOR THE CLASSIFICATION AND CONSTRUCTION OF SEA-GOING SHIPS, 2023,

ND No. 2-020101-174-E

PART XV. AUTOMATION

8 DYNAMIC POSITIONING SYSTEMS

1 **Para 8.2.1** is replaced by the following text:

"8.2.1 Common element means an element of a DP system with a function which depends upon or supports more than one redundant groups, excluding direct interfaces.

Cross connection means an interface between redundant groups.

Dynamic positioning control system (DP control system) means a computer-based programmable system intended for automatic and remote automated control of the auxiliary thrusters, propulsion plants, steering gear, if part of the dynamic positioning system, in order to dynamically keep position and/or heading of the ship with prescribed accuracy under the action of disturbing environmental forces, and consisting of the following:

computer-based system with associated software and interfaces for generation of control signals in automatic mode or with the use of a single control device (joystick);

operator panel system with controls and data displays;

position reference systems;

external force sensors;

power cabling;

information and control cabling.

Dynamic positioning operation (DP operation) means using the dynamic positioning system to control at least two degrees of freedom in the horizontal plane automatically.

Dynamic positioning system (DP system) means the complete installation intended for control of power supply system of the ship, auxiliary thrusters, propulsion plants, steering gear, if part of the dynamic positioning system, in order to dynamically keep position and/or heading of the ship with prescribed accuracy under the action of disturbing environmental forces.

The dynamic positioning system shall comprise, but not be limited to, the following main systems:

power supply system;

thruster system;

dynamic positioning control system.

Failure modes and effects analysis (FMEA) of dynamic positioning system of ships with distinguishing marks **DYNPOS-2** or **DYNPOS-3** in the class notation means a systematic analysis of all potential failures and effects with respect to ship systems and sub-systems, individual machinery items and devices involved in ship dynamic positioning operations carried out to a level of detail that is required to demonstrate that no single failure will cause a loss of position and/or heading as per the worst-case failure design intent.

Hidden failure means a failure that is not immediately evident to dynamic positioning system operator or maintenance personnel and has the potential for failure of equipment to perform a dynamic positioning control system on-demand function (back-up devices, systems and sub-systems of the dynamic positioning system, protective devices for diesel-generator plants, protective devices in main switchboard and switchboards, back-up power supplies, other equipment of the dynamic positioning system).

Independent joystick system means a system for automated control of thruster system using one control providing remote automated positioning control and automatic heading control. The system shall be independent of the main or back-up dynamic positioning control system and shall have its own UPS.

Joystick system means a system for remote automated control of thruster system using one control and providing remote automated positioning and remote automated or automatic heading control.

Loss of position and/or heading of the ship means that the ship's position and/or heading is outside the limits set for carrying out the dynamic positioning activity in progress.

Main dynamic positioning control station (main DP control station) means an operator workstation designated for dynamic positioning operations, which is equipped with control panels, ensures a good view of the ship's exterior limits, and where dynamic positioning control system panels and displays are installed, as well as relevant devices for automatic and joint automated control and devices for separate remote control of thrusters, propulsion plants, steering gear, if part of the dynamic positioning system, emergency stop devices for propulsion plant and thrusters, independent joystick system, devices for switching between control systems, necessary information sources, such as indicators and displays, position reference systems, alarm panels, communication systems.

Power supply system means the system necessary to supply the dynamic positioning system with power under all operating conditions including emergency ones and comprising:

- prime movers of generators with necessary piping and auxiliary systems including fuel, cooling, lubrication oil, hydraulic, pneumatic and pre-heating systems;

- generators;

- switchboards;

- cabling;

- independent power supplies, including uninterruptible power supplies;

- power management systems.

Redundancy of dynamic positioning system means duplication or multiple redundancy of its components, at which an installation consisting of a power supply system and thruster units with their individual control systems is functioning under control of a computer-based system in such a way that failure of particular control systems, particular thruster units or components of the power supply system does not affect the performance of the task to ensure the ship position keeping and/or heading holding.

Ship dynamic position and/or heading keeping means maintaining a desired position and/or heading within the required accuracy and under specified environmental conditions.

Single failure in dynamic positioning system means a failure in active components and/or passive elements of a dynamic positioning system, as defined in 8.5.5 and 8.5.6.

Technical System Configuration (TSC) means a setup of ship's systems for dynamic positioning, including all elements with an impact on the redundant separation, performance, protection and detection. The setup can be provided in a tabulated format at system and sub-system levels with a specific operating mode and status identified.

Thruster system means the system intended for providing adequate thrust in longitudinal and lateral directions at each instant of time as well as yawing moment which can compensate for the environmental factors affecting the ship.

The system shall comprise the following items:

- thrusters with drives and auxiliary equipment including hydraulic piping and tanks (if any);

- main propulsion plant of the ship with supporting systems and steering gear if under the dynamic positioning system control;

- means for individual manual control of each propulsion unit, steering gear and thruster;

and

- associated cabling connecting all system's machinery and systems to the dynamic positioning control system.

Worst-case failure (WCF) means the identified single fault in the dynamic positioning system resulting in maximum detrimental effect on the dynamic positioning system capability to maintain a desired position and/or heading of ship as determined through the FMEA.

.6 any common elements and cross connections identified shall be analysed for a failure propagation. Table 8.15.2.6 provides an example of the format for recording the commonality analysis results;

Table 8.15.2.6

Cross connection worksheet								
Main system				TSC				
Sub-system				Drawing reference				
FMEA ID	Component name, location and ID	Failure mode	Redundancy groups impacted	Cross connection with ID	Type of cross connection	Location	Accepted configuration (connected/isolated, closed, open, etc.)	Reference to proving documentation

.7 the DP FMEA shall provide an analysis of every system relevant for DP in a separate chapter with a summary table concluding on the following:

- system's worst-case single failure;
- possible causes of the worst-case single failure;
- potential hidden failures;
- common point failures;
- cross connections;
- interfaces to other systems within DP perimeter;
- potential configuration errors and setups defeating the redundancy concept;
- status of validation by proving trials;
- any deviations from the Register requirements including the effects of a single point failure.

Each item of the summary shall be explicitly stated, including where no instances are found to report;

.8 if the cross connections are identified, they shall be addressed by:

isolation by removal of any physical link between the redundant groups traceable in the list of isolation points from FMEA appendices;

verification and validation of being safe by design based on the studies and testing;

.9 for the mark **DYNPOS-1**, Table 8.15.2.5 shall include columns for severity, probability of a failure and the final criticality for a DP system's station-keeping function. Such document can be referred to as Failure Mode, Effects and Criticality Analysis (FMECA). FMECA and FMEA are not mandatory conditions for assigning the mark **DYNPOS-1** and are submitted to the Register for familiarization and review on request of the shipowner;

.10 for the marks **DYNPOS-2** and **DYNPOS-3**, the criticality analysis is not required in FMEA;

.11 traceable version and document modification control shall be implemented for the DP FMEA and Proving Trials Report.

8.15.3 The FMEA is a ship specific document and shall be updated after any changes in the equipment and functions of the DP system.

8.15.4 The DP system proving trials document and Proving Trials Report are objective evidence of the FMEA confirmation and are subject to updating together with the FMEA."