



# RUSSIAN MARITIME REGISTER OF SHIPPING

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**CIRCULAR LETTER**

**No. 315-25-1662c**

dated 16.11.2021

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Re:

amendments to the Rules for the Classification and Construction of Sea-Going Ships

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Item(s) of supervision:

automation equipment

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Entry-into-force date:

**01.01.2022**

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Cancels / amends / adds Circular Letter No.

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dated -

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Number of pages:

1 + 4

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Appendices:

Appendix 1: information on amendments introduced by the Circular Letter

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

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Director General

Konstantin G. Palnikov

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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.

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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 of technical documentation on ships contracted for construction or conversion on or after 01.01.2022, in the absence of a contract, on ships, the keels of which are laid, or which are at a similar stage of construction on or after 01.01.2022, during review and approval of the technical documentation on products requested for review on or after 01.01.2022, as well as when performing technical supervision during manufacture of products.
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List of the amended and/or introduced paras/chapters/sections:

Part XV: para 2.1.8

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**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 2.1.8	Requirements for electromagnetic compatibility of automation equipment have been specified considering applicable IEC standards, as well as for harmonization with Section 12 of Part IV "Technical Supervision during Manufacture of Products" of the Rules for Technical Supervision during Construction of Ships and Manufacture of Materials and Products for Ships	315-25-1662c of 16.11.2021	01.01.2022

## RULES FOR THE CLASSIFICATION AND CONSTRUCTION OF SEA-GOING SHIPS, 2021,

ND No. 2-020101-138-E

### PART XV. AUTOMATION

#### 2 DESIGN OF AUTOMATION SYSTEMS, AUTOMATION COMPONENTS AND CONTROL DEVICES

Para 2.1.8 is replaced by the following text:

**2.1.8** Provision shall be made to ensure the electromagnetic compatibility of automation equipment and to keep the radio interference from it to a permissible level.

Categories of equipment according to electromagnetic compatibility depending on the operating conditions are given in Table 2.1.8.

Table 2.1.8

Category of equipment	Description
E1	Equipment installed on the open deck and navigation bridge.
E2	Equipment installed in enclosed machinery and other enclosed spaces of the ship.

**2.1.8.1** For the equipment of category E1, the levels of radiated electromagnetic emission at a distance of 3 m shall not exceed the following values within the frequency ranges stated below:

0,15 — 0,3 MHz – 80 — 52 dB $\mu$ V/m;

0,3 — 30 MHz – 52 — 34 dB $\mu$ V/m;

30 — 1000 MHz – 54 dB $\mu$ V/m;

1000 — 6000 MHz – 54 dB $\mu$ V/m;

except for the range 156 — 165 MHz where 24 dB $\mu$ V/m shall be established.

For the equipment of category E2, the levels of radiated electromagnetic emission at a distance of 3 m shall not exceed the following values within the frequency ranges stated below:

0,15 — 30 MHz – 80 — 50 dB $\mu$ V/m;

30 — 100 MHz – 60 — 54 dB $\mu$ V/m;

100 — 1000 MHz – 54 dB $\mu$ V/m;

1000 — 6000 MHz – 54 dB $\mu$ V/m.

Artificial mains network and quasi-peak measuring receiver shall be used to measure the intensity level of electromagnetic emission. The transmission bandwidth of the receiver for the frequency range 0,15 to 30 MHz and from 156 to 165 MHz shall be 9 kHz, and in the frequency range from 30 to 156 MHz and from 165 MHz to 1 GHz — 120 kHz.

**2.1.8.2** For the equipment of category E1, the levels of caused interference in the supply and input-output circuits shall not exceed the following values within the frequency ranges stated below:

10 — 150 kHz – 96 — 50 dB $\mu$ V;

150 — 350 kHz – 60 — 50 dB $\mu$ V;

350 kHz — 30 MHz – 50 dB $\mu$ V.

For the equipment of category E2, the levels of caused interference in the supply and input-output circuits shall not exceed the following values within the frequency ranges stated below:

10 — 150 kHz – 120 — 69 dB $\mu$ V;

150 — 500 kHz – 79 dB $\mu$ V;

500 kHz — 30 MHz – 73 dB $\mu$ V.

The transmission bandwidth of the receiver when measurements are made in the frequency range from 10 kHz to 150 kHz shall be 200 Hz and in frequency range from 150 kHz to 30 MHz — 9 kHz.

**2.1.8.3** Automation equipment shall be capable of reliable performance when exposed to the following external electromagnetic interference:

**.1** conductive low frequency interference with the parameters as below:

for the equipment supplied by direct current:

frequency range: 50 Hz to 10 kHz;

test voltage (effective value): 10 % of the nominal supply voltage;

test signal maximum power — 2 W;

for the equipment supplied by alternating current:

frequency range: from rated frequency to 200-th harmonic;

test voltage (effective value): 10 % of the rated supply voltage to the 15-th harmonic, reducing from 10 % to 1 % in the range from 15-th to 100-th harmonic; 1 % in the range from 100-th harmonic to 200-th harmonic;

test signal maximum power — 2 W, minimum value of test voltage effective value — 3 V.

The specified value of test voltage may be reduced in case the maximum power exceeds;

**.2** conducted radio frequency interference:

for the equipment of E2 category, the effective voltage value: 3 V at the frequency varying in the range from 150 kHz to 80 MHz.

for the equipment of E1 category, the effective voltage value shall be increased up to 10 V at points with frequencies: 2 MHz, 3 MHz, 4 MHz, 6,2 MHz, 8,2 MHz, 12,6 MHz, 16,5 MHz, 18,8 MHz, 22 MHz and 25 MHz;

frequency variation rate:  $\leq 1,5 \times 10^{-3}$  decade/s (or 1 % / 3 s);

modulation depth: 80 %;

modulation frequency 1000 Hz;

**.3** nanosecond pulse interference in the AC supply lines, signal, data and control circuits with the parameters as below:

pulse rise time: 5 ns (between 10 % and 90 % amplitude level);

duration of unit pulse: 50 ns (at 50 % value);

amplitude: 2 kV when applied to the supply circuits relative to the casing;

amplitude: 1 kV when applied to the signal, control and communication supply circuits;

unit pulse recurrence frequency: 5 kHz or 100 kHz;

pulse burst duration: 15 ms;

burst recurrence period: 300 ms;

duration: 5 min for each positive and negative pulse polarity;

**.4** microsecond pulse interference with the parameters as below:

pulse rise time: 1,2  $\mu$ s (front time);

pulse duration: 50  $\mu$ s (time to half value);

amplitude: 1 kV line/earth;

amplitude: 0,5 kV line/line;

recurrence frequency:  $\geq 1$  pulse/min;

pulse number: 5 pulses for each positive and negative pulse polarity.

Short circuit current:

pulse rise time: 8  $\mu$ s (front time);

pulse width: 20  $\mu$ s (time to half value);

repetition rate:  $\geq 1$  pulse/min;

number of pulses: 5 per polarity;

**.5** electrostatic discharge with the parameters as below:

amplitude: 6 kV for contact discharge;

amplitude: 2 kV, 4 kV and 8 kV for air discharge;

number of pulses: 10 per polarity.

**2.1.8.4** The automation equipment shall be immune to electromagnetic field with the parameters as below:

frequency range: 80 MHz — 6 GHz;

frequency sweep rate:  $\leq 1,5 \times 10^{-3}$  decade/s (or 1 % / 3 s);

field strength: 10 V/m;

modulation depth: 80 %;

modulation frequency: 1000 Hz.

If an equipment is intended to receive radio signals for the purpose of radio communication (e.g. wi-fi router, etc.), then the immunity limits at its communication frequency do not apply."