RUSSIAN MARITIME REGISTER OF SHIPPING

HEAD OFFICE

CIRCULAR LETTER **No.** 315-06-987c dated 22.02.2017

Re:

amendments to Part XI "Electrical Equipment" of the Rules for the Classification and Construction of Sea-Going Ships, 2017, ND No. 2-020101-095-E

Item of technical supervision:

ships under construction

Implementation	01.03.2017
Valid: till	-
Validity period extended till	-
Cancels / amends / supplements Circular letter No. -	- dated -

Number of pages:	1+3
Appendices:	amendments to XI "Electrical Equipment" of the Rules for the Classification and Construction of Sea-Going Ships, 2017, ND No.2-020101-095-E

Director General K.G. Palnikov

Amends Rules for the Classification and Construction of Sea-Going Ships, 2017, ND No. -020101-095-E

We hereby inform that Part XI "Electrical Equipment" of the Rules for the Classification and Construction of Sea-Going Ships, 2017, ND No.2-020101-095-E, shall be supplemented with new Section 22 "SPECIAL REQUIREMENTS TO ELECTRICAL EQUIPMENT OF SHIP'S ELECTRIC POWER SYSTEM WITH ELECTRICAL POWER DISTRIBUTION FOR DIRECT CURRENT" specified in the Appendix to the Circular Letter, in connection with implementation of R&D 21/2015-2016 results.
These amendments will be introduced to the Rules for the Classification and Construction of Sea-Going Ships, 2018, ND No.2-020101-095-E.

It is necessary to do the following:

1. Familiarize the surveyors with the content of the Circular Letter.
2. Bring the content of the Circular Letter to the notice of the interested organizations in the area of the RS Branch Offices' activity.
3. Be guided by the amendments to the RS Rules specified in the Appendix thereto.

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"Thesis" System 17-5276

Appendix to Circular Letter No. 315-06- 984c **dated** 22.02.2017
RULES FOR THE CLASSIFICATION AND CONSTRUCTION OF SEA-GOING SHIPS, 2017,
ND No. 2-020101-095-E

PART XI ELECTRICAL EQUIPMENT

Chapter XI has been supplemented with Section 22 as follows:

"22 SPECIAL REQUIREMENTS TO ELECTRICAL EQUIPMENT OF SHIP'S ELECTRIC POWER SYSTEM WITH ELECTRICAL POWER DISTRIBUTION FOR DIRECT CURRENT

22.1 GENERAL

22.1.1 These requirements shall apply to the ship electric power d.c. distribution systems for with voltage up to 1500V measured between the pole terminals.

22.1.2 For the ship electric power DC distribution system the use of auxiliary sources and items of alternative three-phase current complying with the applicable sections of this Part of the Rules is applicable.

22.1.3 Both direct current generator and rectifier supplying from the alternating current generator may be the sources of d.c. electrical energy.

22.1.4 In addition to the system for insulation resistance monitoring specified in 2.11, the portable devices for search of insulation fault location shall be applied.

22.2 CONNECTION SYSTEMS OF ELECTRIC POWER SUPPLY UNITS

22.2.1 In addition to the requirement to subdivide the DC main busbar into two parts, specified in 3.5.6, it is allowed to use two independent main switchboards interconnected by cable jumpers or bus cables. Automatic switches shall be provided on both ends of the cable jumper or bus cable. In this case, connection of generators and duplicated consumers shall be symmetrically distributed between the main switchboards, where practicable.

22.3 ELECTRICAL POWER DISTRIBUTION

22.3.1 Distribution systems and permissible voltage.

22.3.1.1 In the ship electric power d.c. distribution systems and the unified electric power d.c. distribution plants the application of only two-wire insulated system of electrical energy distribution is allowed.

22.3.1.2 The permissible d.c. voltage at the terminals of electric power sources shall not exceed 1500V.

22.3.1.3 At least two voltmeters shall be provided for d.c. main switchboard. In case d.c. main switchboards are divided, each part shall be fitted with a voltmeter.

22.3.1.4 One ammeter and one voltmeter shall be provided for each rectifier supplying d.c. busbars.

22.3.2 Power supply of essential consumers.

22.3.2.1 Essential consumers may be supplied from the d.c. power distribution box via the converter or from the separate a.c. distribution box supplied from the a.c. generators complying with the requirements of 3.1 and 3.2.

22.3.3 Distribution box arrangement

22.3.2.2 D.c. main switchboard, generator sets and rectifies shall be located in close vicinity to each other, as stated in 4.6.6.5.

22.4 PROTECTION DEVICES

22.4.1 Faults on the DC generator side.

22.4.1.1 When the protection specified in 8.2.6 is activated, the generator shall be shut off from the main switchboard and its excitation shall automatically be removed.

22.4.2 Faults on the rectifier side.

22.4.2.1 The rectifiers shall be fitted with protection devices against the pole-to-pole fault in the cable or bus cable connecting the rectifier and the main switchboard.

22.4.2.2 To control earthing of the poles in equipment and feeders of direct current system, the residual current devices shall be applied.

22.4.2.3 An audible and visual alarm shall be activated in a system at any earth faults..

22.5 ELECTRICAL MACHINES

22.5.1 D.c. generators and electric motors of nominal rated power 1000 kW and above shall be fitted with differential protection devices. For this purpose, a separate lead box shall be provided on a motor casing, located on the opposite side from the main box the slots for the sensors of differential protection shall be provided.

22.5.2 A.c. generators and built-in rectifiers may be provided with common cooling system.

22.6 AC POWER SUPPLY CONSUMER TRANSFORMERS

22.6.1 Transformers fed from the converters and used as power source and shall comply with the rate parameter of permissible stress rate while feeding from the pulse sources.

22 ELECTRICAL POWER CONVERTERS

22.7.1 Heat transfer from power semiconductor elements of converters for d.c. distribution may be performed both by the air cooling system and liquid air coolers.

22.7.2 The rectifiers intended for the parallel operation shall be capable of equal load distribution including short-term load.

22.7.3 The voltage at the uncontrolled rectifier output may be maintained by the excitation system of the generator to be used as power source for the rectifier.

22.7.4 The rectifiers of d.c. power sources shall contain a device for overshoot suppression and reception of excess energy at the rectifier outlet connected to d.c. distribution device.

22.7.5 As the rectifiers of d.c. electrical power source, the active controlled rectifiers constructed by the power source principle with the possibility to stabilise the output voltage and the additional function of reactive power compensation at the input may be applied.
22.7.6 In d.c. input circuit the inverters of the main propulsion plant shall be fitted with a device for overvoltage limitation and reception of surplus power from the electric drive in the regeneration mode.

22.7.7 In the output circuits of inverters the filters shall be installed to limit the stress rate up to the permissible level and to protect the coil insulation of the electric machine or transformer connected to the inverter. ".