

GUIDELINES

ON TECHNICAL SUPERVISION OF SHIPS UNDER CONSTRUCTION

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RULE CHANGE NOTICE

ENTERS INTO FORCE:

01.07.2024



St. Petersburg
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GUIDELINES ON TECHNICAL SUPERVISION OF SHIPS UNDER CONSTRUCTION

The present Rule Change Notice to the Guidelines on Technical Supervision of Ships under Construction (hereinafter — RCN) has been approved in accordance with the established approval procedure and contains information on amendments and additions, except for editorial amendments. RCN amendments come into force on 1 July 2024 (excluding earlier approved amendments of an urgent matter, published by the Circular Letters after entering into force of the previous version of the Guidelines on Technical Supervision of Ships under Construction, specified in the Revision History and highlighted in yellow).

REVISION HISTORY

Item	Applicability	Description	Remarks
Chapter 1.3	Ships under construction Measuring equipment	Requirements have been specified for the measuring equipment used at technical supervision during construction of ships	
Table 3.1.4.1, item 3.2 (new)	Ships under construction Equipment of mooring arrangement	Additional requirement for survey of mooring arrangement have been introduced	
Section 3, para 3.3.4.4 (new)	Tugs and ships intended for towing operations Towing arrangements Total pull test	Additional survey requirements have been introduced in view of issuing of the Bollard Pull Certificate (form 6.3.45)	Entry-into-force date: 01.01.2024 (Circular Letter No. 311-05-1984c of 26.12.2023)
Para 10.4.2.7.17	Sea-going ships Mooring trials of electrical equipment Ship's electric power plant testing	Requirement for measurement of the total harmonic distortion has been introduced	
Section 10, Appendix 4, para 2.5.20	Sea-going ships Mooring trials of electrical equipment Ship's electric power plant testing	Requirements for checking the sufficient power output of the main generators have been specified	
Section 10, Appendix 4, para 2.5.28.3.10	Sea-going ships Mooring trials of electrical equipment Tests of valve-type generator sets	Terminology has been corrected	
Section 10, Appendix 4, para 2.5.28.4.1.11	Sea-going ships Mooring trials of electrical equipment Tests of valve-type generator sets	Terminology has been corrected	

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Item	Applicability	Description	Remarks
Section 10, Appendix 4, para 2.5.28.4.2.10	Sea-going ships Mooring trials of electrical equipment Tests of valve-type generator sets	Terminology has been corrected	
Section 10, Appendix 4, para 2.6.1.3	Ships Electrical equipment Mooring trials	Requirements have been specified regarding the emergency generator testing	
Section 10, Appendix 10 (new)	Sea-going ships Mooring trials of electrical equipment Measurement of the total harmonic distortion	Recommendations on measurement of the total harmonic distortion have been introduced	
Section 12, paras 12.5.5.1.14 and 12.5.5.1.15 (new)	Ships under construction Remote automated control system of CPP Mooring and sea trials	Additional requirements for survey of remote automated control systems of the propulsion plants with CPP	IACS UR M83 (Oct 2023)

1 GENERAL

1.3 REQUIREMENTS TO MEASURING EQUIPMENT USED IN SURVEYS

Chapter 1.3 is replaced by the following text:

"1.3 REQUIREMENTS TO MEASURING EQUIPMENT

1.3.1 Measuring equipment (including instruments and gauges), the readings of which the RS surveyor relies on to make decisions affecting surveys, measurements and tests to determine the ship compliance with the applicable requirements of the RS rules, international conventions and national requirements, shall be individually identified and verified/calibrated to the recognized national or international standards, instructions.

1.3.2 The RS surveyor may accept simple measuring means (e.g. rulers, measuring tapes, weld gauges, micrometers) without individual identification or confirmation of verification/calibration, provided they are of standard commercial design, properly maintained and periodically compared with other similar equipment or test pieces.

1.3.3 The RS surveyor may accept measuring equipment fitted on board a ship and used in survey of the ship's equipment and machinery (e.g. pressure, temperature or rpm gauges and meters) based either on documents, confirming verification/calibration or comparison of readings with other similar equipment.

1.3.4 The RS surveyor shall satisfy himself that other equipment (e.g. tensile test machines and ultrasonic thickness measurement equipment) is verified/calibrated to the recognized national or international standard, manufacturer's instructions or MA requirements."

3 EQUIPMENT, ARRANGEMENTS AND OUTFIT

3.1 GENERAL

Table 3.1.4.1. New item 3.2 with designation of the item of technical supervision is introduced reading as follows:

"

Nos.	Item of technical supervision	Installation on board ship						Mooring trials	Sea trials
		Verification of			Control				
		technical documentation	documents on products	marking, branding	of installation and arrangement onboard	of fixing dimensions	in operation		
3.2	Ropes and joining shackles		+	+	+	+			

"

3.3 CHECKS AND TESTS

New para 3.3.4.4 is introduced reading as follows:

"3.3.4.4 When carrying out surveys on the tugs and ships intended for towing operations, to confirm the total pull of the ship using special towing equipment on different main engine operating conditions and to issue the Bollard Pull Certificate (form 6.3.45) the requirements of 6.11, Part I "General Provisions" of the Guidelines on Technical Supervision of Ships in Service and the Bollard Pull Testing Procedure (Appendix 1 to Annex 28 to the Guidelines on Technical Supervision of Ships in Service) shall be met.

Results of the total pull tests conducted on the prototype ship and/or subsequent ship(s) of a series (refer to 1.1.2, Part I "Classification" of the Rules for the Classification and Construction) may be credited for ship(s) of a series, provided the RS surveyor confirms the following:

- a letter of guarantee justifying the impossibility of conducting tests has been provided by the customer;

- main propulsion plant and screw-rudder system are technically identical on all ships of a series, including the prototype ship;

- results of the total pull tests obtained for the first ship of a series and/or subsequent ship(s) of a series are practically identical;

- the RS technical supervision during construction of the prototype ship and ship(s) of a series has been carried out with satisfactory results.

In this case, the data may be used obtained upon results of the actual total pull tests conducted on the prototype ship and/or subsequent ship(s) of a series and witnessed by the RS surveyor, provided the full (detailed) report on the tests of the main propulsion plant and screw-rudder system for the ships of a series considered is submitted to the RS surveyor and the absence of deviations in the data and results compared to the prototype ship/ship(s) of a series is confirmed in the Report on the Survey of the Ship (form 6.3.10).".

10 ELECTRICAL EQUIPMENT

10.4 MOORING AND SEA TRIALS

Para 10.4.2.7.17 is amended as follows:

".17 availability and proper functioning of electrical power sources and consumers, their electromagnetic compatibility, including measurement of the total harmonic distortion K_u according to Appendix 10.".

APPENDIX 4

RECOMMENDATIONS ON PERFORMANCE OF MOORING TRIALS OF ELECTRICAL EQUIPMENT

Para 2.5.20. The **first sentence** is amended as follows:

~~"In~~During the tests specified in 2.5.19 of this Appendix, generators shall operate without overloading ~~accordingly distributed among the generators running in parallel~~ single generator

operation and operation in-parallel shall be provided, accordingly, without overloading with the rated voltage (and frequency) kept stable."

Para 2.5.28.3.10 is amended as follows:

".10 when during the valve-type generator set operation an additional device (harmonics filter) is required for reducing ~~a voltage non-sinusoidality ratio~~ the total harmonic distortion K_u in the ship's mains, then this device with the required characteristics shall be installed and connected to the mains during the valve-type generator set tests;"

Para 2.5.28.4.1.11 is amended as follows:

".1.11 ~~voltage non-sinusoidality ratio~~ total harmonic distortion K_u at the converter input and output;"

Para 2.5.28.4.2.10 is amended as follows:

".2.10 ~~voltage non-sinusoidality ratio~~ total harmonic distortion K_u at the converter input;"

Para 2.6.1.3 is replaced by the following text:

".3 where the emergency source is a generator, it shall be tested by the maximum possible load corresponding to all the emergency services within the whole design time set of its operation¹. ~~After the generator stop, the fuel oil in the emergency generator tank shall be measured; the remaining fuel oil shall be sufficient for at least 2 h of additional operation of the generator prime mover;"~~

Footnote 1 is replaced by the following text:

¹ The duration of emergency generator testing may be reduced with the steady and reliable operation under the load of ~~all the emergency services~~, but in all cases it shall be at least 1/3 of the time the emergency generator operation is designed for. At that the fuel consumption of the diesel generator shall correspond to the passport data, and there shall be enough fuel in the fuel tank of the diesel generator to provide uninterrupted operation of the generator during design time of its operation at the design load, considering the "dead" fuel under adverse conditions of the ship's heel and trim."

New Appendix 10 is introduced reading as follows:

"APPENDIX 10

RECOMMENDATIONS ON MEASUREMENT OF THE TOTAL HARMONIC DISTORTION

1 The total harmonic distortion (hereinafter, K_u) shall be measured on ships where the aggregate power output of the semi-conductor converters exceeds 20 % of the total power output generated by the main supply sources.

2 The total harmonic distortion K_u shall be measured by a power quality analyzer or a similar instrument intended for the appropriate measurements.

3 The measurements may be taken by the standard fixed electrical instruments having function of measuring or recording the total harmonic distortion K_u or the voltage curve harmonic components.

4 Values of the total harmonic distortion K_u are specified for the complete ship's power system and shall not exceed the values given in 2.2.1.3, Part XI "Electrical Equipment" of the Rules for the Classification and Construction.

5 In case of harmonic filters in the system with electrical power distribution (refer to 4.7, Part XI "Electrical Equipment" of the Rules for the Classification and Construction), the total harmonic distortion K_u shall be measured with and without filters. Measurements without filters shall be taken in the permitted operating modes specified in the system integrator report (refer to 4.7.2, Part XI "Electrical Equipment" of the Rules for the Classification and Construction).

6 The total harmonic distortion K_u shall be measured at the locations (electrical instrument connection points) specified in the RS-approved test programme, including but not limited to the following:

- .1** on the main alternating-current switchboard busbars;
- .2** in supply circuit of the electrical propulsion plant (EPP), if installed on board the ship, and/or the most powerful of the shipboard electric drives with semi-conductor converter;
- .3** on agreement with RS, at the circuit segments where, according to the approved documentation, the design values of the total harmonic distortion K_u exceed the values given in 2.2.1.3, Part XI "Electrical Equipment" of the Rules for the Classification and Construction.

7 Measurements shall be taken upon completion of transient processes in supply network in the steady-state operating modes.

8 The total harmonic distortion K_u shall be tested and measured in different operating modes of the ship's electric power plant (SEPP) and EPP at the points of the maximum estimated (design) total harmonic distortion K_u .

9 The total harmonic distortion K_u shall be tested and measured with different number of operating supply sources (single and parallel operation) with the maximum permissible load of semi-conductor converters composing EPP or shipboard electric drive.

10 Modes with the maximum total harmonic distortion K_u are the SEPP operating modes, in which the total power of the operating semi-conductor converters is the maximum in relation to the total power of supply sources operating in these modes.

11 For the ships equipped with EPP, the total harmonic distortion K_u shall be measured, inter alia, during sea trials with the EPP maximum load prescribed for the specific SEPP operating mode.

12 For the ships not equipped with EPP, the total harmonic distortion K_u may be measured during mooring trials with the possible operation of the most powerful semi-conductor transducers in modes close to the rated ones and operation of consumers under conditions close to operating ones.

13 The total harmonic distortion K_u shall be measured during the period specified in the RS-approved test programme and required for taking measurements considering specifics of the SEPP and EPP operating modes.

14 Based on the test results the total harmonic distortion K_u calculation report shall be drawn up containing the following information:

- .1** measurement points (electrical instrument connection points) and duration;
- .2** list of the electrical instruments used for measurements and tests;
- .3** list of the shipboard electrical equipment in operation during measurements and tests. In case of a large number of equipment, it is allowed to indicate the main equipment (the most powerful of semi-conductor converters) and its specifications or references to design documentation;
- .4** measurement results for each test mode for each electrical instrument connection point.

15 The test results are considered satisfactory when the following conditions are met:

.1 values of the total harmonic distortion K_u during tests and measurements do not exceed the values given in 2.2.1.3, Part XI "Electrical Equipment" of the Rules for the Classification and Construction;

.2 in case of exceeding the values given in 2.2.1.3, Part XI "Electrical Equipment" of the Rules for the Classification and Construction, the values of the total harmonic distortion K_u shall correspond to design values given in the equipment design documentation;

.3 electrical equipment remains operative in accordance with its purpose during and after tests and measurements. There is no deterioration (decrease) in performance or loss of functions defined in the relevant equipment standard and the manufacturer's technical documentation."

12 AUTOMATION EQUIPMENT

12.5 ADDITIONAL INSTRUCTIONS ON TESTING OF INDIVIDUAL AUTOMATION SYSTEMS AND DEVICES

New paras 12.5.5.1.14 and 12.5.5.1.15 are introduced reading as follows:

".14 pitch response test.

A full range of tests shall be carried out to get the pitch response and verify that it coincides with the combinator curve of the propeller (relationship between the propeller pitch setting and the propeller speed). The tests shall be carried out for at least three positions of the control lever in ahead and astern directions (e.g., dead slow ahead/astern, half ahead/astern, full ahead/astern) in normal and emergency operating conditions. Tests that are not affected by the control position may be carried out from one control position only. During the test, the list of the parameters established by the pitch control system manufacturer or integrator shall be recorded. The list shall be agreed with the Register and include at least the following parameters:

position of the control handle;

actual pitch indication (local, remote);

rotational speed of the propeller;

response time between the pitch change order (modification of the lever position) and the instant when the pitch and propeller speed have reached their final position;

propelling thrust variation during the transfer of the control from one location to another one;

.15 test of the fail-to-safe characteristics.

A test of the fail-to-safe characteristics of the propeller pitch control system shall be carried out to demonstrate that failures in the pitch command and control or feedback signals are alarmed and do not cause any change of thrust. Such failures shall be clearly identified and included in the test procedure. Test procedure shall be prepared and submitted by the pitch control system manufacturer or integrator for agreement by the Register.

Test results shall demonstrate:

that the propelling thrust is not significantly altered when transferring control from one location to another and in case of failures in the pitch command and control or feedback signals;

that the pitch response times measured during the test do not exceed the maximum value to be defined by the pitch control system manufacturer or integrator."

Russian Maritime Register of Shipping

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