

Review of the Organization of the Society's Rules for Machinery (Computer Based Systems)

Amended Rules and Guidance

- Rules for the Survey and Construction of Steel Ships Part D
- Rules for High Speed Craft
- Rules for the Survey and Construction of Inland Waterway Ships
- Guidance for the Survey and Construction of Steel Ships Parts B, and D
- Guidance for Automatic and Remote Control Systems
- Guidance for High Speed Craft
- Guidance for the Survey and Construction of Inland Waterway Ships
- Guidance for the Approval and Type Approval of Materials and Equipment for Marine Use

Reason for Amendment

ClassNK typically specifies requirements for relatively new equipment with insufficiently established service histories in annexes to the ClassNK Guidance instead of as formal requirements in the ClassNK Rules so as to allow some flexibility in the use and installation of such equipment. For this reason, detailed requirements for computer based systems were originally specified in Annex D18.1.1, Part D of the Guidance back in 2017. Since that time, however, the reliability of such systems and the effectiveness of the Society's requirements for them has been more than sufficiently established.

With this in mind and as part of an ongoing comprehensive review of the organization of requirements for machinery, the Society decided to transfer the requirements of the annex to the Part D of the Rules.

Accordingly, relevant requirements were amended so as to transfer the requirements in Annex D18.1.1 to Part D of the Rules. This is being done as part of a comprehensive review of the ClassNK Rules.

Outline of Amendment

Transferred requirements for computer based systems from Annex D18.1.1, Part D of the Guidance for the Survey and Construction of Steel Ships to Annex 18.1.1, Part D of the Rules for the Survey and Construction of Steel Ships.

“Rules for the survey and construction of steel ships” has been partly amended as follows:

Part D MACHINERY INSTALLATIONS

Chapter 18 AUTOMATIC AND REMOTE CONTROL

18.1 General

18.1.1 Scope*

Sub-paragraph -3 has been amended as follows.

3 Computer based systems, including the hardware and software which constitute such systems, are to be in accordance with ~~requirements specified otherwise by the Society~~ **Annex 18.1.1** in addition to those specified in **-1** and **-2** above and throughout the rest of this chapter for design, construction, commissioning, maintenance, etc.

18.1.3 Drawings and Data*

Sub-paragraphs (1) and (2) have been amended as follows.

Drawings and data to be submitted are generally, as follows. In cases where the Society deems it to be necessary, the submission of drawings and data other than those specified below may be requested.

- (1) Drawings and data for approval
 - (a) to (e) are omitted.)
 - (f) Drawings and data ~~deemed necessary by the Society~~ listed in 1.2(1), Annex 18.1.1 for computer based systems specified in **18.1.1-3**. With respect to computer based systems which have been already approved by the Society in accordance with Chapter 8, Part 7 of the Guidance for the Approval and Type Approval of Materials and Equipment for Marine Use, only drawings and data on parts that differ from ship to ship need to be submitted.
- (2) Drawings and data for reference
 - Drawings and data ~~deemed necessary by the Society~~ listed in 1.2(2), Annex 18.1.1 for computer based systems specified in **18.1.1-3**. With respect to computer based systems which have been already approved by the Society in accordance with Chapter 8, Part 7 of the Guidance for the Approval and Type Approval of Materials and Equipment for Marine Use, only drawings and data on parts that differ from ship to ship need to be submitted; this, however, excludes those specified in 1.2(2)(a) of the Annex.

Annex 18.1.1 has been added as follows.

Annex 18.1.1 COMPUTER BASED SYSTEMS

Chapter 1 INTRODUCTION

1.1 General

1.1.1 Scope

The requirements in this annex apply to computer based systems, including the hardware and software which constitute such systems, in accordance with **18.1.1-3, Part D of the Rules.**

1.1.2 References

For the purpose of application of this annex, the following identified standards may be used for the development of hardware/software of computer based systems. Other industry standards, however, may also be considered.

- (1) *IEC 61508* “Functional safety of electrical/electronic/programmable electronic safety-related systems”
- (2) *ISO/IEC 12207* “Systems and software engineering - Software life cycle processes”
- (3) *ISO 9001:2008* “Quality Management Systems – Requirements”
- (4) *ISO/IEC 90003* “Software engineering - Guidelines for the application of *ISO 9001:2008* to computer software”
- (5) *IEC 60092-504* “Electrical installations in ships - Part 504: Special features - Control and instrumentation”
- (6) *ISO/IEC 25000* “Systems and software engineering - Systems and software Quality Requirements and Evaluation (SQuaRE) - Guide to SQuaRE”
- (7) *ISO/IEC 25041* “Systems and software engineering - Systems and software Quality Requirements and Evaluation (SQuaRE) - Evaluation guide for developers, acquirers and independent evaluators”
- (8) *IEC 61511* “Functional safety - Safety instrumented systems for the process industry sector”
- (9) *ISO/IEC 15288* “Systems and software engineering - system life cycle process”

1.2 Submission of Drawings and Data

The following drawings and data are, in principle, to be submitted. In cases where deemed necessary by the Society, other drawings and data may be required. However, no submission is required for category I systems unless it is specifically requested by the Society.

- (1) Drawings and data for approval:
 - (a) Documents related to quality management:
 - i) Documents showing satisfaction of a quality system **(3.1.1-2)**
 - ii) Quality plan **(3.1.1-3)**
 - iii) Documents related to security policies **(3.4.1-1)**
 - (b) Test programs and procedures for intra-system integration testing **(3.1.3)**:
 - (c) Test program for simulation tests for final integration **(3.1.5-1)**:
 - (d) Test program for on board tests (includes tests related to wireless data links) **(3.1.5-2** and **5.2.2(3))**; and

- (e) Test reports of environmental tests specified in 18.7.1(1), Part D of the Rules or a certificate issued in accordance with Chapter 1, Part 7 of the Guidance for the Approval and Type Approval of Materials and Equipment for Marine Use (3.1.4 and Chapter 4).
- (2) Drawings and data for reference:
 - (a) List of computer based systems installed on board;
 - (b) Risk assessment report or justification for the omission of risk assessment (3.1.2);
 - (c) Documents related to software code creation and testing, etc.:
 - i) Software module functional descriptions and associated hardware descriptions for programmable devices
 - ii) Evidence of verification (detection and correction of software errors) for software modules in accordance with the selected software development standard
 - iii) Evidence of functional tests for programmable devices at the software module, subsystem, and system levels (The functional testing is to be designed to test the provisions of features used by the software but provided by the operating system, function libraries, customized layer of software and any set of parameters.)
 - iv) Functional description of software
 - v) List and versions of software installed in system
 - (d) other drawings and data concerning systems such as the following:
 - i) User manual including instructions for use during software maintenance
 - ii) List of interfaces between system and other vessel systems
 - iii) List of standards used for data links

1.3 Omission of Surveyor Attendance during Testing

For category I systems, the presence of the Surveyor at the tests specified in this Annex may be omitted.

Chapter 2 DEFINITIONS

2.1 Stakeholders

2.1.1 Owner

The owner is responsible for contracting the system integrator and/or suppliers regarding the provision of a hardware system, including software, according to the owner's specification. The owner may be the "ship builder integrator" (builder or shipyard) during initial construction. After vessel delivery, the owner may delegate some responsibilities to the vessel operating company.

2.1.2 System Integrator

At ship construction, the role of the system integrator is to be taken by the shipyard unless an alternative organization is specifically contracted or assigned this responsibility.

The system integrator is responsible for the integration of systems and products provided by suppliers into the system subject to the requirements specified herein and for providing the integrated system. The system integrator may also be responsible for integration of the systems in the vessel.

If there are multiple parties performing system integration at any one time, then a single party is to be responsible for overall system integration and coordinating the integration activities. If there are multiple stages of integration, then different system integrators may be responsible for the specific stages of integration; in such cases, however, a single party is to be responsible for defining and coordinating all of the stages of integration.

2.1.3 Supplier

The supplier is any contracted or subcontracted provider of system components or software under the coordination of the system integrator or shipyard. The supplier is responsible for providing software, programmable devices, sub-systems or systems to the system integrator. The supplier is to provide a description of the software functionality which meets the owner's specification, applicable international and national standards, and the requirements specified herein.

2.2 Objects

2.2.1 Object Definitions

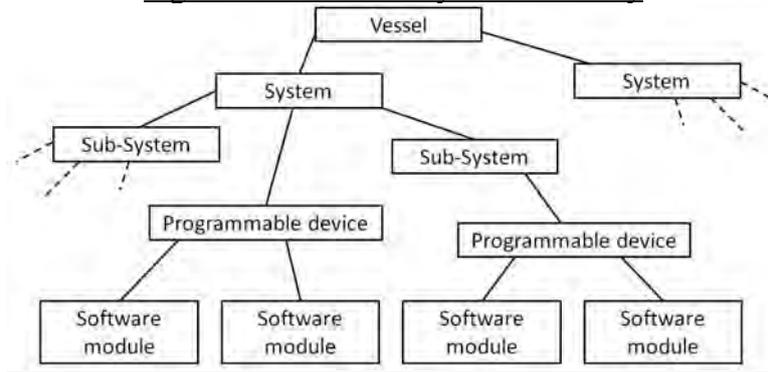
1 Fig. 2.1 shows the hierarchy and relationships of a typical computer based system.

2 "Vessel" is the ship or offshore unit where the system is to be installed.

3 "System", "sub-system" and "programmable device" are as specified in **18.1.2, Part D of the Rules.**

4 "Software module" is a standalone piece of code which provides specific and closely coupled functionality.

Fig. 2.1 Illustrative system hierarchy



2.2.2 System Categories

Systems are typically assigned category I, II or III as shown in **Table 2.1** based upon their effect upon system functionality. The exact category, however, is dependent upon the risk assessment for all operational scenarios.

Table 2.1 System categories

Category	Effects	Typical system functionality
I	Those systems, failure of which will not lead to dangerous situations for human safety, safety of the vessel and/or threat to the environment.	- Monitoring function for informational or administrative tasks
II	Those systems, failure of which could eventually lead to dangerous situations for human safety, safety of the vessel and/or threat to the environment.	- Alarm and monitoring functions - Control functions which are necessary to maintain the vessel in its normal operational and habitable conditions
III	Those systems, failure of which could immediately lead to dangerous situations for human safety, safety of the vessel and/or threat to the environment.	- Control functions for maintaining the vessel's propulsion and steering - Vessel safety functions

Notes:

1 The following systems typically belong to Category III:

- (1) vessel propulsion systems, which is defined as the means to generate and control mechanical thrust in order to move the vessel (devices used only during maneuvering, such as bow tunnel thrusters, do not fall under the scope of this requirement);
- (2) steering system control systems;
- (3) electric power systems (including power management system);
- (4) vessel safety systems covering fire detection and fighting, flooding detection and fighting, internal communication systems involved in evacuation phases, vessel systems involved in operation of life saving appliances equipment;
- (5) dynamic positioning systems of equipment classes 2 and 3 according to *IMO MSC/Circ.645*, as amended;
- (6) drilling systems; and
- (7) other systems deemed necessary by the Society.

2 The following systems typically belong to Category II:

- (1) liquid cargo transfer control systems,
- (2) bilge level detection and associated pump control systems,
- (3) fuel oil treatment systems,
- (4) ballast transfer valve remote control systems,
- (5) stabilization and ride control systems,
- (6) alarm and monitoring systems for propulsion systems, and
- (7) other systems deemed necessary by the Society.

2.3 Other Terminology

2.3.1 Simulation Tests

“Simulation test” is a control system testing where the equipment under control is partly or fully replaced with simulation tools, or where parts of the communication network and lines are replaced with simulation tools.

Chapter 3 REQUIREMENTS FOR SOFTWARE AND SUPPORTING HARDWARE

3.1 Life Cycle Approach

A global top-to-bottom approach is to be undertaken regarding software and its integration into a system, spanning the software lifecycle. This approach is to be accomplished according to software development standards as listed herein or other standards recognized by the Society.

3.1.1 Quality System

1 System integrators and suppliers are to operate a quality system regarding software development and testing and associated hardware such as ISO 9001 taking into account ISO 90003.

2 Satisfaction of the requirement specified in -1 above is to be demonstrated through either of the following (1) or (2):

- (1) The quality system being certified as compliant to the recognized standard by an organization with accreditation under a national accreditation scheme, or
- (2) The quality system being confirmed compliance with a recognized standard by the Society through a specific assessment.

3 The quality system specified in -1 above is to include a quality plan documenting the items listed in the following (1) to (4):

- (1) Relevant procedures regarding responsibilities, system documentation, configuration management and competent staff.
- (2) Relevant procedures regarding software lifecycle and associated hardware. These procedures are to include the following (a) to (c):
 - (a) the organization set in place for acquisition of related hardware and software from suppliers,
 - (b) the organization set in place for software code writing and verification, and
 - (c) the organization set in place for system validation before integration in the vessel.
- (3) For category II and III systems, the information specified in the following (a) to (c):
 - (a) Specific procedures for verification of software code at the level of systems, sub-systems and programmable devices and modules,
 - (b) Drawings and data submitted for the Society and tests witnessed by the Surveyor, and
 - (c) Specific procedures for software modification and installation on board the vessel defining interactions with owners.
- (4) Relevant procedures regarding application of the quality management system for the specific computer based system.

3.1.2 Design Phase

Risk assessments of systems are to be according to the following (1) to (4):

(1) This step is to be undertaken to determine the risks to the system throughout its lifecycle by identifying and evaluating the hazards associated with each function of the system. A risk assessment report is to be submitted to the Society in cases where deemed necessary by the Society.

This document is normally to be submitted by the system integrator or the supplier, and is to include any data coming from other suppliers.

(2) IEC/ISO 31010 “Risk management - Risk assessment techniques” may be applied in order to determine the method of risk assessment. The method of risk assessment is to be agreed to by the Society.

- (3) Based upon the risk assessment, a revised system category may need to be agreed upon by the Society and the system supplier.
- (4) In cases where the risks associated with a computer based system are well understood, it is permissible for the risk assessment to be omitted; in such cases, however, the supplier or the system integrator is to provide a justification for the omission. The justification is to give consideration to the following (a) to (c):
 - (a) How the risks are known.
 - (b) The equivalence of the context of use of the current computer based system and the computer based system initially used to determine the risks.
 - (c) The adequacy of existing control measures in the current context of use.

3.1.3 Integration Testing before Installation On Board

1 Intra-system integration testing is to be done between system and sub-system software modules before being integrated on board. The objective is to check the following (1) to (3):

- (1) the software functions are properly executed,
- (2) the software and the hardware it controls interact and function properly together, and
- (3) the software systems react properly in the case of failures.

2 Faults are to be simulated as realistically as possible to demonstrate appropriate system fault detection and system response. The results of any required failure analysis are to be observed.

3 Functional and failure testing may be demonstrated by simulation tests.

4 Category II and III systems are to comply with the following (1) to (3) in addition to the requirements in -1 to -3 above:

- (1) Test programs and procedures for functional tests and failure tests are to be submitted to the Society. A FMEA may be requested by the Society in order to support containment of failure tests programs.
- (2) Factory acceptance test including functional and failure tests is to be witnessed by the Society.

5 In applying -1 to -4 above, the tests are to be carried out when the computer based system acquires approval of use in accordance with **Chapter 1, Part 7 of the Guidance for the Approval and Type Approval of Materials and Equipment for Marine Use** or for each product.

3.1.4 Approval of Programmable Devices for Category II and III Systems

1 Approval is to be granted on a case-by-case basis, except in cases where the programmable device has received approval of use in accordance with the requirements specified in **Chapter 1, Part 7 of the Guidance for the Approval and Type Approval of Materials and Equipment for Marine Use**.

2 The application for the approval of a programmable device integrated inside a system is to be made by the system integrator or supplier.

3 With respect to -1 above, documentation for approval is recommended to address the information specified in the following (1) to (3):

- (1) the compatibility of the programmable device in the vessel's application
- (2) the necessity to have on board tests during vessel integration, and
- (3) the components of the systems using the approved programmable device.

3.1.5 Final Integration and On Board Testing

1 For computer based systems integrated with other computer based systems, simulation tests are to be undertaken before installation in cases where it is found necessary to check safe interaction with the other computer based systems and functions which are unable to be previously tested.

2 On board tests are to check whether a computer based system in its final environment and which is integrated with all other systems with which it interacts is as follows:

- (1) performing the functions for which it was designed,
- (2) reacting safely in the case of failures originating internally or by devices external to the

system, and

(3) interacting safely with other systems implemented into on board systems.

3 In applying the requirements specified in -1 and -2 above, for category II and III systems, the following requirements are to be applied:

(1) Test specifications are to be submitted to the Society for approval.

(2) The tests are to be witnessed by a surveyor assigned by the Society.

3.2 Limited Approval

3.2.1 General

1 Sub-systems and programmable devices may be approved by the Society for limited applications with service restrictions in cases where the vessel systems in which they will be integrated into is not known. In such cases, sub-systems and programmable devices may be granted limited approval mentioning the required checks and tests performed.

2 In cases specified in -1 above, requirements about quality systems specified in 3.1.1 may need to be satisfied as deemed necessary by the Society. Additional drawings, details, tests reports and surveys related to the standard declared by the supplier may be required by the Society upon request.

3.3 Modifications during Operation

3.3.1 Responsibilities

1 Organizations in charge of software modifications are to be clearly identified by owner to the Society.

2 A system integrator is to be designated by the owner as appropriate and is to satisfy the requirements specified in 3.1.

3 Limited life cycle steps may be considered for modifications already considered and accepted in the scope of initial approval.

4 The level of documentation necessary to be provided for modifications is to be determined by the Society on a case-by-case basis.

5 At the vessel level, it is the responsibility of the owner to manage traceability of modifications. For category II and III systems, the software registry which contains the following (1) and (2) is to be updated. The achievement of this responsibility may be supported by system integrators updating the software registry:

(1) the lists and versions of software installed in systems, and

(2) the results of the security scans as described in 3.4.1-3.

3.3.2 Change Management

1 The owner is to ensure that necessary procedures for software and hardware change management exist on board, and that any software modifications or upgrades are performed according to the procedures.

2 All changes to computer based systems in the operational phase are to be recorded and be traceable.

3.4 System Security

3.4.1 General

1 Owners, system integrators and suppliers are to adopt security policies and include these in their quality systems and procedures.

2 Physical and logical security measures are to be in place to prevent unauthorized or unintentional modification of software, whether undertaken at the physical system or remotely.

3 Prior to installation, all artefacts (intermediate work products produced during the development of software), software code, executables and the physical medium used for installation on the vessel are to be scanned for viruses and malicious software. Results of the scan are to be documented and kept with the software registry.

Chapter 4 REQUIREMENTS FOR HARDWARE REGARDING ENVIRONMENT

4.1 General

Environmental tests for hardware, which includes systems and/or sub-systems, are to comply with the requirements specified in **18.7.1(1), Part D of the Rules**. However, this requirement is not mandatory for category I systems.

Chapter 5 REQUIREMENTS FOR DATA LINKS

5.1 Requirements for Data Links

5.1.1 General Requirements

- 1 The requirements of this chapter apply to category II and III systems, unless otherwise specified.
- 2 Loss of a data link is to be specifically addressed in risk assessment analysis.
- 3 A single failure in data link hardware is to be automatically treated in order to restore proper working of system. For category III systems, a single failure in data link hardware is not to influence the proper working of the system.
- 4 Characteristics of data links are to prevent overloading in any operational condition of system.
- 5 Data links are to be self-checking, detecting failures on the link itself and data communication failures on nodes connected to the link. Detected failures are to initiate an audible and visual alarm.

5.2 Specific Requirements for Wireless Data Links

5.2.1 Requirements for Category III Systems

Category III systems are not to use wireless data links unless specifically considered by the Society on the basis of an engineering analysis carried out in accordance with an international or national standard acceptable to the Society.

5.2.2 Requirements for Category II Systems

Category II systems may use wireless data links in accordance with the following (1) to (3) requirements:

- (1) Recognised international wireless communication system protocols incorporating the following (a) to (d) are to be employed:
 - (a) Message integrity
Fault prevention, detection, diagnosis, and correction so that the received message is not corrupted or altered when compared to the transmitted message.
 - (b) Configuration and device authentication
Only connection of devices included in the system design are to be permitted.
 - (c) Message encryption
Protection of the confidentiality and or criticality of the data content.
 - (d) Security management
Protection of network assets, prevention of unauthorized access to network assets.
- (2) The internal wireless system within the vessel is to comply with the radio frequency and power level requirements of the International Telecommunication Union and flag state requirements.
- (3) For wireless data communication equipment, tests during harbour and sea trials are to be conducted to demonstrate the following (a) and (b):
 - (a) Radio-frequency transmission does not cause failure of any equipment during expected operations.
 - (b) Radio-frequency transmission does not cause itself to fail as a result of electromagnetic interference during expected operating conditions during expected operations.

“Rules for high speed craft” has been partly amended as follows:

Part 9 MACHINERY INSTALLATIONS

Chapter 12 AUTOMATIC AND REMOTE CONTROL

12.1 General

12.1.1 Scope*

Sub-paragraph -3 has been amended as follows.

3 Computer based systems, including the hardware and software which constitute such systems, are to be in accordance with ~~requirements specified otherwise by the Society~~ **Annex 18.1.1, Part D of the Rules for the Survey and Construction of Steel Ships** in addition to those specified in -1 and -2 above and throughout the rest of this chapter for design, construction, commissioning, maintenance, etc.

12.1.3 Drawings and Data*

Sub-paragraphs (1) and (2) have been amended as follows.

Drawings and data to be submitted are generally, as follows. In cases where the Society deems it to be necessary, the submission of drawings and data other than those specified below may be requested.

- (1) Drawings and data for approval
 - (a) to (e) are omitted.)
 - (f) Drawings and data ~~deemed necessary by the Society~~ **listed in 1.2(1), Annex 18.1.1, Part D of the Rules for the Survey and Construction of Steel Ships** for computer based systems specified in **12.1.1-3**. **With respect to computer based systems which have been already approved by the Society in accordance with Chapter 8, Part 7 of the Guidance for the Approval and Type Approval of Materials and Equipment for Marine Use, only drawings and data on parts that differ from ship to ship need to be submitted.**
- (2) Drawings and data for reference
 - Drawings and data ~~deemed necessary by the Society~~ **listed in 1.2(2), Annex 18.1.1, Part D of the Rules for the Survey and Construction of Steel Ships** for computer based systems specified in **12.1.1-3**. **With respect to computer based systems which have been already approved by the Society in accordance with Chapter 8, Part 7 of the Guidance for the Approval and Type Approval of Materials and Equipment for Marine Use, only drawings and data on parts that differ from ship to ship need to be submitted; this, however, excludes those specified in 1.2(2)(a) of the Annex.**

“Rules for the survey and construction of inland waterway ships” has been partly amended as follows:

Part 7 MACHINERY INSTALLATIONS

Chapter 14 AUTOMATIC AND REMOTE CONTROL

14.1 General

14.1.1 Scope*

Sub-paragraph -3 has been amended as follows.

3 Computer based systems, including the hardware and software which constitute such systems, are to be in accordance with ~~requirements specified otherwise by the Society~~ **Annex 18.1.1, Part D of the Rules for the Survey and Construction of Steel Ships** in addition to those specified in -1 and -2 above and throughout the rest of this chapter for design, construction, commissioning, maintenance, etc.

14.1.3 Drawings and Data*

Sub-paragraphs (1) and (2) have been amended as follows.

Drawings and data to be submitted are generally, as follows. However, other drawings and data may be required in cases where deemed necessary by the Society.

(1) Drawings and ~~data~~ data for approval:

((a) to (e) are omitted.)

(f) Drawings and data ~~deemed necessary by the Society~~ listed in **1.2(1), Annex 18.1.1, Part D of the Rules for the Survey and Construction of Steel Ships** for computer based systems specified in **14.1.1-3**. With respect to computer based systems which have been already approved by the Society in accordance with Chapter 8, Part 7 of the Guidance for the Approval and Type Approval of Materials and Equipment for Marine Use, only drawings and data on parts that differ from ship to ship need to be submitted.

(2) Drawings and data for reference

Drawings and data ~~deemed necessary by the Society~~ listed in **1.2(2), Annex 18.1.1, Part D of the Rules for the Survey and Construction of Steel Ships** for computer based systems specified in **14.1.1-3**. With respect to computer based systems which have been already approved by the Society in accordance with Chapter 8, Part 7 of the Guidance for the Approval and Type Approval of Materials and Equipment for Marine Use, only drawings and data on parts that differ from ship to ship need to be submitted; this, however, excludes those specified in 1.2(2)(a) of the Annex.

“Guidance for the survey and construction of steel ships” has been partly amended as follows:

Part B CLASS SURVEYS

B9 PLANNED MACHINERY SURVEYS

B9.1 Planned Machinery Surveys

B9.1.4 Condition Based Maintenance Scheme (CBM)

Sub-paragraph -5(2) has been amended as follows.

5 Approval of CBM

((1) is omitted.)

(2) Condition monitoring system

The condition monitoring system is to satisfy the following requirements specified in **(a)** to **(h)**. In cases where this system is modified, that modification is to be approved by the Society.

((a) is omitted.)

(b) The hardware and software of the computer is to comply with **B9.1.3-4(5)(a)** to **(e)** and **Annex ~~D18.1.1 “COMPUTER BASED SYSTEMS”~~, Part D of the Guidance Rules.**

((c) to (h) are omitted.)

Part D MACHINERY INSTALLATIONS

D18 AUTOMATIC AND REMOTE CONTROL

D18.1 General

Paragraph D18.1.1 has been amended as follows.

D18.1.1 Scope

~~1~~ In cases where dynamic positioning systems (DPS), which are regarded as part of the automatic and remote control systems of main propulsion machinery, are installed, the requirements of **Chapter 18, Part D of the Rules** are to apply.

~~2~~ The “requirements specified otherwise by the Society” referred to in ~~18.1.1 3, Part D of the Rules~~ means ~~Annex D18.1.1 “COMPUTER BASED SYSTEMS”~~

Paragraph D18.1.3 has been deleted.

~~D18.1.3 Drawings and Data~~

~~1~~ The “drawings and data deemed necessary by the Society” stipulated in ~~18.1.3(1)(f), Part D of the Rules~~ refer to the items specified in ~~1.2(1) of Annex D18.1.1 “COMPUTER BASED SYSTEMS”~~ as a standard. With respect to computer based systems which have been already approved by the Society in accordance with ~~Chapter 8, Part 7 of the Guidance for the Approval and Type Approval of Materials and Equipment for Marine Use~~, only drawings and data on parts that differ from ship to ship need to be submitted.

~~2~~ The “drawings and data deemed necessary by the Society” stipulated in ~~18.1.3(2), Part D of the Rules~~ refer to the items specified in ~~1.2(2) of Annex D18.1.1 “COMPUTER BASED SYSTEMS”~~ as a standard. With respect to computer based systems which have been already approved by the Society in accordance with ~~Chapter 8, Part 7 of the Guidance for the Approval and Type Approval of Materials and Equipment for Marine Use~~, only drawings and data on parts that differ from ship to ship need to be submitted; this, however, excludes those specified in ~~1.2(2)(a) of the Annex.~~

Annex D18.1.1 has been deleted.

~~Annex D18.1.1 — COMPUTER BASED SYSTEMS~~

~~(Omitted)~~

“Guidance for automatic and remote control systems” has been partly amended as follows:

Chapter 2 SURVEYS OF AUTOMATIC AND REMOTE CONTROL SYSTEMS

2.2 Registration Surveys

2.2.1 Drawings and Data

Sub-paragraph -2 has been amended as follows.

(-1 is omitted)

2 In applying **2.2.1(1)(a)** and **(2)(a) of the Rules**, in cases where the automatic and remote control system includes computer based systems subject to **18.1.1-3, Part D of the Rules for the Survey and Construction of Steel Ships**, the drawings and data stipulated in **1.2, Annex D18.1.1 “COMPUTER BASED SYSTEMS”, Part D of the ~~Guidance~~ Rules for the Survey and Construction of Steel Ships** are to be submitted. However, for computer based systems which have been already approved by the Society in accordance with **Chapter 8, Part 7 of the Guidance for the Approval and Type Approval of Materials and Equipment for Marine Use**, only drawings and data on parts that differ from ship to ship need to be submitted; this, however, excludes those specified in **1.2(2)(a)** of the said Annex.

(-3 is omitted)

“Guidance for high speed craft” has been partly amended as follows:

Part 9 MACHINERY INSTALLATIONS

Chapter 12 AUTOMATIC AND REMOTE CONTROL

12.1 General

12.1.1 Scope

Sub-paragraph -2 has been deleted.

~~2—The “requirements specified otherwise by the Society” referred to in 12.1.1-3, Part 9 of the Rules means Annex D18.1.1 “COMPUTER BASED SYSTEMS”, Part D of the Guidance for the Survey and Construction of Steel Ships.~~

Paragraph 12.1.3 has been deleted.

~~12.1.3 Drawings and Data~~

~~1—The “drawings and data deemed necessary by the Society” stipulated in 12.1.3(1)(f), Part 9 of the Rules refer to the items specified in 1.2(1), Annex D18.1.1 “COMPUTER BASED SYSTEMS”, Part D of the Guidance for the Survey and Construction of Steel Ships as a standard. With respect to computer based systems which have been already approved by the Society in accordance with Chapter 8, Part 7 of the Guidance for the Approval and Type Approval of Materials and Equipment for Marine Use, only drawings and data on parts that differ from ship to ship need to be submitted.~~

~~2—The “drawings and data deemed necessary by the Society” stipulated in 12.1.3(2), Part 9 of the Rules refer to the items specified in 1.2(2), Annex D18.1.1 “COMPUTER BASED SYSTEMS”, Part D of the Guidance for the Survey and Construction of Steel Ships as a standard. With respect to computer based systems which have been already approved by the Society in accordance with Chapter 8, Part 7 of the Guidance for the Approval and Type Approval of Materials and Equipment for Marine Use, only drawings and data on parts that differ from ship to ship need to be submitted; this, however, excludes those specified in 1.2(2)(a) of the Annex.~~

“Guidance for the survey and construction of inland waterway ships” has been partly amended as follows:

Part 7 MACHINERY INSTALLATIONS

Chapter 14 AUTOMATIC AND REMOTE CONTROL

14.1 General

14.1.1 Scope

Sub-paragraph -2 has been deleted.

~~2— The “requirements specified otherwise by the Society” referred to in 14.1.1.3, Part 7 of the Rules means Annex D18.1.1 “COMPUTER BASED SYSTEMS”, Part D of the Guidance for the Survey and Construction of Steel Ships.~~

Paragraph 14.1.3 has been deleted.

~~14.1.3 Drawings and Data~~

~~1— The “drawings and data deemed necessary by the Society” stipulated in 14.1.3(1)(f), Part 7 of the Rules refer to the items specified in 1.2(1), Annex D18.1.1 “COMPUTER BASED SYSTEMS”, Part D of the Guidance for the Survey and Construction of Steel Ships as a standard. With respect to computer based systems which have been already approved by the Society in accordance with Chapter 8, Part 7 of the Guidance for the Approval and Type Approval of Materials and Equipment for Marine Use, only drawings and data on parts that differ from ship to ship need to be submitted.~~

~~2— The “drawings and data deemed necessary by the Society” stipulated in 14.1.3(2), Part 7 of the Rules refer to the items specified in 1.2(2), Annex D18.1.1 “COMPUTER BASED SYSTEMS”, Part D of the Guidance for the Survey and Construction of Steel Ships as a standard. With respect to computer based systems which have been already approved by the Society in accordance with Chapter 8, Part 7 of the Guidance for the Approval and Type Approval of Materials and Equipment for Marine Use, only drawings and data on parts that differ from ship to ship need to be submitted; this, however, excludes those specified in 1.2(2)(a) of the Annex.~~

“Guidance for the approval and type approval of materials and equipment for marine use” has been partly amended as follows:

Part 7 CONTROL AND INSTRUMENTATION EQUIPMENT AND ELECTRICAL INSTALLATIONS

Chapter 1 APPROVAL OF USE OF AUTOMATIC DEVICES AND EQUIPMENT

Table 7.1-1 has been amended as follows.

Table 7.1-1 Environmental Test Items, Testing Conditions, Methods, and Criteria

Test Item	Testing condition and method		Criteria
External examination	(Omitted)		(Omitted)
Operation test and performance test			
Electrical power supply failure test			
Electrical power supply fluctuation test			
Power supply fluctuation test			
Insulation resistance test			
High voltage test			
Pressure test			
Dry heat test			
Damp heat test			
Vibration test			
Inclination test			
Cold test			
Salt mist test			
Electrostatic discharge immunity test			
Radiated radio frequency immunity test	(Omitted)		(Omitted)
	(Omitted)	(Omitted)	
	- If for tests of equipment an input signal with a modulation frequency of 1 kHz is necessary a modulation frequency of 400 Hz may be chosen. - If equipment is intended to receive radio signals for the purpose of radio communication (e.g. wifi router, remote radio controller), then the immunity limits at its communication frequency do not apply, subject to the provisions in 5.2 of Annex D18.1.1, Part D of the Rules for the Survey and Construction of Steel Ships. - Detailed test methods are according to Level 3 of IEC 61000-4-3.		

Table 7.1-1 Environmental Test Items, Testing Conditions, Methods, and Criteria (continued)

Test Item	Testing condition and method		Criteria	
Conducted low frequency immunity test	(Omitted)		(Omitted)	
Conducted high frequency immunity test				
Electrical burst/fast transient immunity test				
Surge immunity test				
Radiated emission test	(Omitted)		(Omitted)	
	Frequency range: Up to 1 GHz	(Omitted)		
	Frequency range: Above 1 GHz	(Omitted)		(Omitted)
		(Omitted)		(Omitted)
		- Distance between equipment and antenna is to be 3 m. - Equipment intended to transmit radio signals for the purpose of radio communication (e.g. wifi router, remote radio controller) may be exempted from limits, within its communication frequency range, subject to the provisions in 5.2 of Annex D18.1.1, Part D of the Guidance Rules for the Survey and Construction of Steel Ships. - Detailed test methods are according to <i>CISPR</i> 16-2-3.		
Conducted emission test	(Omitted)		(Omitted)	
Flame retardant test				

(Remarks are omitted.)

Chapter 8 APPROVAL OF USE OF COMPUTER BASED SYSTEMS

8.1 General

8.1.1 Scope

Sub-paragraph -1 has been amended as follows.

1 The requirements in this chapter apply to tests and inspection for “approval of use” of computer based systems belong to category II or III specified in **2.2.2, Annex D18.1.1 “Computer Based Systems”, Part D of the Guidance Rules for the Survey and Construction of Steel Ships** (hereinafter referred to as “the Annex” in this chapter) in accordance with **D18.1.3, Part D of the Guidance Rules for the Survey and Construction of Steel Ships, 2.2.1-2 of the Guidance Rules for Automatic and Remote Control System, 12.1.3, Part 9 of the Guidance for High Speed Craft, 14.1.3, Part 7 of the Guidance Rules for the Survey and Construction of Inland Waterway Ships and 3.1.3-1 of the Annex.**