RULES FOR HIGH SPEED CRAFT

GUIDANCE FOR HIGH SPEED CRAFT

Rules for High Speed Craft 2021 AMENDMENT NO.2
Guidance for High Speed Craft 2021 AMENDMENT NO.2

Rule No.65 / Notice No.62 27 December 2021
Resolved by Technical Committee on 28 July 2021

ClassNK
NIPPON KAIJI KYOKAI

An asterisk (*) after the title of a requirement indicates that there is also relevant information in the corresponding Guidance.

RULES FOR HIGH SPEED CRAFT

RULES

2021 AMENDMENT NO.2

Rule No.65 27 December 2021

Resolved by Technical Committee on 28 July 2021

An asterisk (*) after the title of a requirement indicates that there is also relevant information in the corresponding Guidance.

Rule No.65 27 December 2021
AMENDMENT TO THE RULES FOR HIGH SPEED CRAFT

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

Amendment 2-1

Part 7 EQUIPMENT AND PAINTING

Chapter 1 EQUIPMENT

1.1 Anchors, Chain Cables and Ropes

Paragraph 1.1.7 has been amended as follows.

1.1.7 Supporting Hull Structures of Anchor Windlasses and Chain Stoppers

1 The supporting hull structures of anchor windlasses and chain stoppers are to be sufficient to accommodate operating loads and sea loads

(1) Operating loads are to be taken as not less than the following:
  (a) For chain stoppers, 80% of the chain cable breaking load
  (b) For windlasses, where no chain stopper is fitted or a chain stopper is attached to the windlass, 80% of the chain cable breaking load
  (c) For windlasses, where chain stoppers are fitted but not attached to the windlass, 45% of the chain cable breaking load

(2) Sea loads are to be taken according to **2.1.6, Section 4, Chapter 11, Part 1 of Part CSR-B&T**

2 The permissible stresses for supporting hull structures of windlasses and chain stoppers~~, based on gross thicknesses,~~ are not to be greater than the following permissible values:

~~(1) Normal stress: 1.00 R_{eH}~~

~~(2) Shear stress: 0.60 R_{eH}~~

(1) For strength assessment by means of beam theory or grillage analysis:
  (a) Normal stress: 1.00 R_{eH}
  (b) Shear stress: 0.60 R_{eH}
  R_{eH}: The specified minimum yield stress of the material

(2) For strength assessments using finite element analysis:
  (a) Von Mises stress: 1.00 R_{eH}

(3) The normal stress referred to in **(1)** above is the sum of bending stress and axial stress with the corresponding shearing stress acting perpendicular to the normal stress. No stress concentration factors are to be considered.

(4) The followings are recommended to be followed for the strength assessment by means of finite element analysis referred to in **(2) above**.
  (a) The geometry is to be idealized as realistically as possible.
  (b) The ratio of element length to width is not to exceed 3.
  (c) Girders are to be modelled using shell or plane stress elements.
  (d) Symmetric girder flanges may be modelled by beam or truss elements.
  (e) The element height of girder webs is not to exceed one-third of the web height.
  (f) In way of small openings in girder webs the web thickness is to be reduced to a mean thickness over the web height.
  (g) Large openings are to be modelled

(h) Stiffeners may be modelled by using shell, plane stress, or beam elements.
(i) Stresses are to be read from the centre of the individual element.
(j) For shell elements the stresses are to be evaluated at the mid-plane of the element.

3 For strength assessments of supporting hull structures, beam theory or finite element analysis using net scantlings is to be applied as appropriate. In addition, the scantlings of supporting hull structure are to be built at least with the gross scantling obtained by adding the corrosion addition 2.0 *mm* to net scantlings obtained by the criteria specified in this section.

Chapter 3 BULWARKS, GUARDRAILS, FREEING ARRANGEMENTS, CARGO PORTS AND OTHER SIMILAR OPENINGS, SIDE SCUTTLES, VENTILATORS AND GANGWAYS

3.6 Ventilators

3.6.3 Closing Appliances*

Sub-paragraph -3 has been amended as follows.

3 In cases where ventilation louvers with means for closure are fitted to emergency generator rooms or closing appliances are fitted to ventilators serving emergency generator rooms, the requirements specified in the **1.2.5-2, Part 9** are to be satisfied.

Part 9 MACHINERY INSTALLATIONS

Chapter 1 GENERAL

1.2 General Requirements for Machinery Installations

1.2.5 Ventilating Systems for Machinery Spaces*

Sub-paragraph -2 has been amended as follows.

2 In cases where ventilation louvers with means for closure are fitted to emergency generator rooms ~~or~~ and closing appliances are fitted to ventilators serving emergency generator rooms, such louvers or closing appliances are to comply with the requirements specified in the following **(1)** to **(4)**:

(1) Louvers and closing appliances may either be hand-operated or power-operated (hydraulic, pneumatic or electric) and are to be operable under fire conditions.

(2) Hand-operated louvers and closing appliances are to ~~comply with the following **(a) and (b):**~~
~~(a) Louvers and closing appliances are to~~ be kept open during normal operation of the vessel~~; and~~.
~~(b)~~ In addition, ~~C~~corresponding instruction plates are to be provided at the location where hand-operation is provided.

(3) Power-operated louvers and closing appliances are to ~~comply with the following **(a) to (c):**~~
~~(a) Louvers and closing appliances are to~~ be of a fail-to-open type~~;~~.
~~(b)~~ However, ~~C~~closed power-operated louvers and closing appliances are acceptable during normal operation of the vessel~~; and~~.
~~(c)~~ Power-operated louvers and closing appliances are to open automatically whenever the emergency generator is starting or in operation.

(4) Ventilation openings~~, louvers and closing appliances~~ with means for closure are to ~~comply with the following **(a) to (c):**~~
~~(a) It is to~~ be possible to close ~~ventilation openings~~ by a manual operation from a clearly marked safe position outside the space where the closing operation can be easily confirmed~~;~~.
~~(b)~~ In addition, ~~T~~the louver status (open or closed) is to be indicated at ~~the~~ this position ~~of the manual operation specified in **(a)** above;~~ ,and
~~(c)~~ the ~~C~~closing of ~~the~~ louvers and closing appliances is not to be possible from any ~~other~~ remote position other than ~~the~~this position ~~of manual operation specified in **(a)** above~~.

EFFECTIVE DATE AND APPLICATION (Amendment 2-1)

1. The effective date of the amendments is 1 January 2022.

2. Notwithstanding the amendments to the Rules, the current requirements apply to ships for which the date of contract for construction* is before the effective date.

* "contract for construction" is defined in the latest version of IACS Procedural Requirement (PR) No.29.

IACS PR No.29 (Rev.0, July 2009)

1. The date of "contract for construction" of a vessel is the date on which the contract to build the vessel is signed between the prospective owner and the shipbuilder. This date and the construction numbers (i.e. hull numbers) of all the vessels included in the contract are to be declared to the classification society by the party applying for the assignment of class to a newbuilding.

2. The date of "contract for construction" of a series of vessels, including specified optional vessels for which the option is ultimately exercised, is the date on which the contract to build the series is signed between the prospective owner and the shipbuilder.

For the purpose of this Procedural Requirement, vessels built under a single contract for construction are considered a "series of vessels" if they are built to the same approved plans for classification purposes. However, vessels within a series may have design alterations from the original design provided:

(1) such alterations do not affect matters related to classification, or

(2) If the alterations are subject to classification requirements, these alterations are to comply with the classification requirements in effect on the date on which the alterations are contracted between the prospective owner and the shipbuilder or, in the absence of the alteration contract, comply with the classification requirements in effect on the date on which the alterations are submitted to the Society for approval.

The optional vessels will be considered part of the same series of vessels if the option is exercised not later than 1 year after the contract to build the series was signed.

3. If a contract for construction is later amended to include additional vessels or additional options, the date of "contract for construction" for such vessels is the date on which the amendment to the contract, is signed between the prospective owner and the shipbuilder. The amendment to the contract is to be considered as a "new contract" to which **1.** and **2.** above apply.

4. If a contract for construction is amended to change the ship type, the date of "contract for construction" of this modified vessel, or vessels, is the date on which revised contract or new contract is signed between the Owner, or Owners, and the shipbuilder.

Note:
This Procedural Requirement applies from 1 July 2009.

Amendment 2-2

Part 9 MACHINERY INSTALLATIONS

Chapter 2 RECIPROCATING INTERNAL COMBUSTION ENGINES

2.1 General

2.1.1 General*

Sub-paragraph -3 has been deleted, Sub-paragraphs -4 to -6 have been renumbered to Sub-paragraphs -3 to -5.

~~**3 Electronically-controlled engines which are used as the main propulsion machinery are to be in accordance with the requirements specified otherwise by the Society in addition to those in this Chapter.**~~

~~**4**~~**3** (Omitted)
~~**5**~~**4** (Omitted)
~~**6**~~**5** (Omitted)

2.1.2 Terminology

Sub-paragraph -3 has been added as follows.

3 For electronically-controlled engines, the terminology is as specified in the following **(1)** to **(10)**:
(1) "Electronically-controlled engines" are engines whose fuel injection and/or Exhaust valve operation etc. are electronically controlled.
(2) "Accumulators" are small pressure vessels fitted to cylinders which provide hydraulic oil to those actuators attached to fuel injection devices or exhaust valve driving gears.
(3) "Common accumulators" are pressure vessels common to all cylinders for providing hydraulic oil or pressurized fuel oil.
(4) "Control valves" are components to control the delivery of hydraulic oil to drive actuators. The name control valve is generic for on-off-controlled solenoid valves, proportional-controlled valves or variable-controlled valves, etc.
(5) "Fuel oil pressure pumps" are pumps which provide pressurized fuel oil for common accumulators.
(6) "Hydraulic oil pressure pumps" are pumps to provide hydraulic oil for equipment, e.g. fuel injection devices, exhaust valve driving gears or control valves, through common accumulators.
(7) "Functional blocks" are blocks used to classify by function all items making up whole systems into the groups of systems, sub-systems, components, assemblies and parts.
(8) "Reliability block diagrams" are logical figures showing the relationship between functional blocks on an analytic level.
(9) "Normal operation" of main propulsion machinery means those operations at normal out-put conditions, using governors and all safety devices.
(10) "High-pressure" piping means piping in the down-stream of fuel oil pressure pumps or hydraulic oil pressure pumps.

2.1.5 Materials, Construction and Strength*

Sub-paragraph -7 has been added as follows.

7 Essential components are to be so arranged that normal operation of main propulsion machinery is capable of being sustained or restored even though one of these components becomes inoperable, except in cases where special consideration and approval is given by the Society to the reliability of single arrangements. Single components provided for cylinders, which do not require a spare, may be acceptable in cases where any failed parts can be isolated.

2.3 Associated Installations

Paragraphs 2.3.6 to 2.3.10 have been added as follows.

2.3.6 Control Valves for Electronically-controlled Engines which are used as the Main Propulsion Machinery

1 Control valves are to be capable of retaining their expected ability to function properly for a period of time set by manufacturers.

2 Control valves are to be independently provided for each function (e.g. fuel injection, exhaust valve driving).

3 Means are to be provided to prevent fuel oil from continuously flowing into cylinders due to control valve failure.

2.3.7 Accumulators and Common Accumulators for Electronically-controlled Engines which are used as the Main Propulsion Machinery

1 Accumulators and common accumulators are to comply with the requirements in **Chapter 10, Part D of the Rules for the Survey and Construction of Steel Ships**. However, notwithstanding this requirement, materials and non-destructive tests as well as surface inspections and dimension inspections are to be in accordance with **Table D2.1, Part D of the Rules for the Survey and Construction of Steel Ships** and hydrostatic tests are to be in accordance with **Table D2.6, Part D of the Rules for the Survey and Construction of Steel Ships.**

2 Accumulators are to be capable of retaining their expected ability to function properly for a period of time set by manufacturers.

3 In principle, at least two common accumulators are to be provided. However, in cases where results of fatigue analysis upon fluctuating stress are submitted and approved by the Society, a single arrangement may be acceptable.

2.3.8 Fuel Oil Piping Systems and Hydraulic Oil Piping Systems for Electronically-controlled Engines which are used as the Main Propulsion Machinery

1 At least two fuel oil pressure pumps and hydraulic oil pressure pumps are to be provided for their respective lines and are to be capable of supplying a sufficient amount of oil at the maximum continuous output of main propulsion machinery. In such cases, even though a single one of these pumps may become inoperable, the remaining pumps are to be capable of supplying a sufficient amount of fuel under normal service conditions. In cases where one or more of these pumps are provided as a stand-by pump, the pumps are to always be connected and ready for use.

2 Piping arrangements from fuel oil pressure pumps to the fuel injection devices and from hydraulic oil pressure pumps to exhaust valve driving gears are to be protected with jacketed piping systems or oil tight enclosures, to prevent any spread of oil from igniting.

3 Two common piping arrangements from fuel oil pressure pumps or a hydraulic oil pressure

pumps to common accumulators, from one common accumulator to another common accumulator and from common accumulators to those positions where distribution to cylinders are to be respectively provided. In cases where results of fatigue analysis upon fluctuating stress are submitted and approved by the Society, a single arrangement may be acceptable.

4 Valves or cocks provided on piping connected to equipment, e.g. accumulators or pumps, are to be located as close to such equipment as practicable.

5 In high-pressure piping, high-pressure alarms are to be provided. Relief valves are also to be provided at proper positions, so as to lead any released oil to lower-pressure sides.

6 In cases where pressure gauges using bourdon-tubes are provided in high-pressure piping, such gauges are to be ones that comply with recognized industrial standards, e.g. *JIS*, and be vibration-proof and heat-resistant types.

2.3.9 Electronic Control Systems for Electronically-controlled Engines which are used as the Main Propulsion Machinery

1 Systems are to be so arranged that the function of an entire system is capable of being sustained or restored in cases where there is a single failure in any equipment part or circuit.

2 Controllers for systems are to comply with the following:

(1) At least two main controllers which are integrated to control every function, e.g. fuel injection, exhaust valve drive, cylinder lubrication and supercharge, are to be provided.

(2) Notwithstanding the requirement in **(1)** above, a single main controller may be acceptable, in cases where normal operation of main propulsion machinery is available by using control systems independent from main controllers.

3 At least two sensors essential for the operation of main propulsion machinery, e.g. for the following uses, are to be independently provided. In cases where normal operation of main propulsion machinery is available without any feedback from such sensors, single arrangements may be acceptable.

(1) Number of revolutions

(2) Crank angles

(3) Fuel pressure in common accumulators

4 Power for control systems is to be supplied from two independent sources, one of which is to be supplied from a battery, and through two independent circuits.

5 Power for driving solenoid valves is to be supplied from two independent sources, and through two independent circuits.

6 Electronic-control systems of main propulsion machinery which comply with the requirements given in **-1** through **-5** above are regarded as the same as those which comply with the following requirements.

(1) **18.2.4-5(1), Part D of the Rules for the Survey and Construction of Steel Ships**.

(2) **18.3.2-3(3), Part D of the Rules for the Survey and Construction of Steel Ships**.

2.3.10 Failure Mode Effect Analysis for Electronically-controlled Engines which are used as the Main Propulsion Machinery

Failure Mode Effect Analysis (FMEA) is to be carried out, for electronic control systems, in order to confirm that any one equipment or circuits in such systems which lose function may not cause any malfunction or deterioration in other equipment or circuits, in accordance with the following:

(1) Systems are to be divided into functional blocks and drawn out in reliability block diagrams in which such functional blocks are systematically organized.

(2) Analytic levels are to be sufficient up to the extent of those functional blocks regarding sub-systems and components.

(3) FMEA results are to be created in table form as shown in **Table 9.2.1** or be of equivalent

forms thereto.

(4) If FMEA results show that corrective action is demanded, then FMEA is to be carried out again after the corrective action to confirm the effectiveness of the corrective action.

(5) For failure modes, every possible failure from minor to catastrophic is to be considered.

Table 9.2.1 Failure Mode Effect Analysis Table for Electronically-controlled Engines which are used as the Main Propulsion Machinery

Systems					Elements								
ID Number	Component	Sub-system	Operating mode	Failure mode	Failure cause	Failure detection Means	Alarm / Notification Means	Effect of failure			Failure severity	Corrective action	Remarks
								On component	On sub-system	On system			

Examples of Operating Mode: ack-up operations, fuel cost priority operations, NOx reduction operations, etc.

Examples of Failure Mode: piston pin stuck, connecting rod broken, lubricating oil leaked out, etc. (Failed parts are to be shown.)

Failure Severity:

(a) Catastrophic: loss of complete function, explosion, loss of life (Design change is to be compulsory.)

(b) Major: loss or deterioration of part of the ability to function properly (Possible design change is to be investigated.)

(c) Minor: negligible affect on ability to function properly (Design change may not be required.)

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.

Chapter 13 SPARE PARTS, TOOLS AND INSTRUMENTS

13.2 Spare Parts, Tools and Instruments

13.2.1 Spare Parts

Sub-paragraphs -5 and -6 have been renumbered to Sub-paragraphs -6 and -7, and Sub-paragraph -5 has been added as follows.

5 The following parts are to be provided as the spare parts for electronically-controlled engines used as main propulsion machinery.
(1) Control valves: 1 of each type
(2) Accumulator diaphragms: 2 of each type
(3) Sensors provided for each cylinder (Spare parts may be omitted in cases where normal operation of main propulsion machinery is available without these sensors.): 1 of each type

Sub-paragraphs -6 and -7 have been amended as follows.

~~5~~6 The spare parts for the machinery installations specified in **-1** to **-~~4~~5** are those required for each one set of the machinery installations. In the case where the craft is installed with two or more sets of the machinery installations of the same type for the same service, only one set of spare parts for the machinery installations may be acceptable.

However, the number of water gauge glasses of round type and flat type is required to be the number specified in **-3** for each boiler, and the number of flat type water gauge frames is required to be one for each two boilers.

~~6~~7 Notwithstanding the requirement specified in **-~~5~~6** no spare parts are required for the machinery installations specified in following **(1)** to **(4)**.
((1) to (4) are omitted.)

EFFECTIVE DATE AND APPLICATION (Amendment 2-2)

1. The effective date of the amendments is 1 January 2022.

Amendment 2-3

Part 9 MACHINERY INSTALLATIONS

Chapter 6 BOILERS, THERMAL OIL HEATERS, INCINERATORS AND PRESSURE VESSELS

6.1 Boilers

Paragraph 6.1.1 has been amended as follows.

6.1.1 Drawings and Data

Drawings and data to be submitted are generally as follows:

(1) Drawings (with materials and scantlings)

((a) to (k) are omitted.)

(2) Data

(a) Particulars of the boiler (design pressure, design temperature, maximum evaporation, heating surface, etc.)

((b) and (c) are omitted.)

EFFECTIVE DATE AND APPLICATION (Amendment 2-3)

1. The effective date of the amendments is 1 January 2022.

2. Notwithstanding the amendments to the Rules, the current requirements apply to ships for which the date of contract for construction is before the effective date.

3. Notwithstanding the provision of preceding **2.**, the amendments to the Rules may apply to ships for which the date of contract for construction is before the effective date upon request of the owner.

Amendment 2-4

Part 9 MACHINERY INSTALLATIONS

Chapter 7 PIPES, VALVES, PIPE FITTINGS AND AUXILIARIES

7.1 General

7.1.2 Materials*

Sub-paragraph -5 has been amended as follows.

5 ~~Such s~~Special materials such as rubber hoses, plastic pipes~~,~~ (including vinyl pipes) complying with **Annex 12.1.6, Part D of the Rules for the Survey and Construction of Steel Ships**, aluminium alloys, etc., (notwithstanding **-3** above)~~,~~ may be used in cases where approved by the Society in accordance with requirements specified otherwise after taking into account their safety against fire and flooding as well as their service conditions.

EFFECTIVE DATE AND APPLICATION (Amendment 2-4)

1. The effective date of the amendments is 1 July 2022.

2. Notwithstanding the amendments to the Rules, the current requirements apply to plastic piping systems other than those which fall under the following:

(1) plastic piping systems for which the application for approval of use is submitted to the Society on or after the effective date;

(2) plastic piping systems for which the date of renewal of approval of use is on or after the effective date; or

(3) plastic piping systems used on ships for which the date of contract for construction* is on or after the effective date.

* "contract for construction" is defined in the latest version of IACS Procedural Requirement (PR) No.29.

IACS PR No.29 (Rev.0, July 2009)

1. The date of "contract for construction" of a vessel is the date on which the contract to build the vessel is signed between the prospective owner and the shipbuilder. This date and the construction numbers (i.e. hull numbers) of all the vessels included in the contract are to be declared to the classification society by the party applying for the assignment of class to a newbuilding.

2. The date of "contract for construction" of a series of vessels, including specified optional vessels for which the option is ultimately exercised, is the date on which the contract to build the series is signed between the prospective owner and the shipbuilder.

For the purpose of this Procedural Requirement, vessels built under a single contract for construction are considered a "series of vessels" if they are built to the same approved plans for classification purposes. However, vessels within a series may have design alterations from the original design provided:

(1) such alterations do not affect matters related to classification, or

(2) If the alterations are subject to classification requirements, these alterations are to comply with the classification requirements in effect on the date on which the alterations are contracted between the prospective owner and the shipbuilder or, in the absence of the alteration contract, comply with the classification requirements in effect on the date on which the alterations are submitted to the Society for approval.

The optional vessels will be considered part of the same series of vessels if the option is exercised not later than 1 year after the contract to build the series was signed.

3. If a contract for construction is later amended to include additional vessels or additional options, the date of "contract for construction" for such vessels is the date on which the amendment to the contract, is signed between the prospective owner and the shipbuilder. The amendment to the contract is to be considered as a "new contract" to which **1.** and **2.** above apply.

4. If a contract for construction is amended to change the ship type, the date of "contract for construction" of this modified vessel, or vessels, is the date on which revised contract or new contract is signed between the Owner, or Owners, and the shipbuilder.

Note:
This Procedural Requirement applies from 1 July 2009.

GUIDANCE FOR HIGH SPEED CRAFT

GUIDANCE

2021 AMENDMENT NO.2

Notice No.62 27 December 2021

Resolved by Technical Committee on 28 July 2021

Notice No.62 27 December 2021
AMENDMENT TO THE GUIDANCE FOR HIGH SPEED CRAFT

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

Amendment 2-1

Part 2 CLASS SURVEYS

Chapter 3 PERIODICAL SURVEYS AND PLANNED MACHINERY SURVEYS

3.9 Propeller Shaft and Stern Tube Shaft Surveys

3.9.4 Partial Surveys

Sub-paragraph -1(2) has been amended as follows.

1 The "reference standards deemed appropriate by the Society" referred to in **3.9.4-1(2)(b)i), Part 2 of the Rules** means the reference standards specified in the following **(1)** and **(2)**:

(1) (Omitted)

(2) The following **(a)** and **(b)** upper limits for IR Oxidation and separated water; however, in the case of environmentally acceptable lubricants (EAL), regardless of the following **(a)**, observation of any trends (such as TAN (total acid number), viscosity and change in colour etc.) based on periodical oil analysis ~~can~~ may be made. In such cases, observations of TAN trends are to be made based on sequential analysis in conjunction with limits for continued use in service defined by oil makers.

(a) IR oxidation @ 5.85μm: 10 (*Abs.unit/cm*)

(b) Separated water: 1.0 *%*

Part 9 MACHINERY INSTALLATIONS

Chapter 2 RECIPROCATING INTERNAL COMBUSTION ENGINES

2.1 General

2.1.1 General

Sub-paragraph -2 has been deleted, and Sub-paragraph -3 has been renumbered to Sub-paragraph -2.

~~**2 The wording "the requirements specified otherwise by the Society" in 2.1.1-3, Part 9 of the Rules means "GUIDANCE FOR THE ADDITIONAL REQUIREMENTS ON ELECTRONICALLY-CONTROLLED ENGINES" in Annex D2.1.1, Part D of the Guidance for the Survey and Construction of Steel Ships.**~~

Sub-paragraph -2 has been amended as follows.

~~**3**~~**2** The wording "the requirements specified otherwise by the Society" in **2.1.1-~~6~~5, Part 9 of the Rules** means **Annex 3 "GUIDANCE FOR HIGH PRESSURE GAS-FUELLED ENGINES"** or **Annex 4 "GUIDANCE FOR LOW PRESSURE GAS-FUELLED ENGINES" of Part GF**.

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.~~

EFFECTIVE DATE AND APPLICATION (Amendment 2-1)

1. The effective date of the amendments is 1 January 2022.

Amendment 2-2

Part 9 MACHINERY INSTALLATIONS

Chapter 1 GENERAL

1.2 General Requirements for Machinery Installations

Paragraph 1.2.5 has been deleted.

~~**1.2.5 Ventilating Systems for Machinery Spaces**~~

~~The wording "louvers" specified in **1.2.5-2, Part 9 of the Rules** means the following:~~

~~(1) Those which are hand-operated;~~

~~(2) Those which are power-operated;~~

~~(3) Those which are of fixed type with a hand-operated closing door; and~~

~~(4) Those which are of fixed type with an automatic closing door.~~

EFFECTIVE DATE AND APPLICATION (Amendment 2-2)

1. The effective date of the amendments is 1 January 2022.

2. Notwithstanding the amendments to the Guidance, the current requirements apply to ships for which the date of contract for construction* is before the effective date.

* "contract for construction" is defined in the latest version of IACS Procedural Requirement (PR) No.29.

IACS PR No.29 (Rev.0, July 2009)

1. The date of "contract for construction" of a vessel is the date on which the contract to build the vessel is signed between the prospective owner and the shipbuilder. This date and the construction numbers (i.e. hull numbers) of all the vessels included in the contract are to be declared to the classification society by the party applying for the assignment of class to a newbuilding.

2. The date of "contract for construction" of a series of vessels, including specified optional vessels for which the option is ultimately exercised, is the date on which the contract to build the series is signed between the prospective owner and the shipbuilder.

For the purpose of this Procedural Requirement, vessels built under a single contract for construction are considered a "series of vessels" if they are built to the same approved plans for classification purposes. However, vessels within a series may have design alterations from the original design provided:

(1) such alterations do not affect matters related to classification, or

(2) If the alterations are subject to classification requirements, these alterations are to comply with the classification requirements in effect on the date on which the alterations are contracted between the prospective owner and the shipbuilder or, in the absence of the alteration contract, comply with the classification requirements in effect on the date on which the alterations are submitted to the Society for approval.

The optional vessels will be considered part of the same series of vessels if the option is exercised not later than 1 year after the contract to build the series was signed.

3. If a contract for construction is later amended to include additional vessels or additional options, the date of "contract for construction" for such vessels is the date on which the amendment to the contract, is signed between the prospective owner and the shipbuilder. The amendment to the contract is to be considered as a "new contract" to which **1.** and **2.** above apply.

4. If a contract for construction is amended to change the ship type, the date of "contract for construction" of this modified vessel, or vessels, is the date on which revised contract or new contract is signed between the Owner, or Owners, and the shipbuilder.

Note:
This Procedural Requirement applies from 1 July 2009.

Amendment 2-3

Part 9 MACHINERY INSTALLATIONS

Chapter 7 PIPES, VALVES PIPE FITTINGS AND AUXILIARIES

7.1 General

Paragraph 7.1.2 has been amended as follows.

7.1.2 Materials

~~1~~ The wording "~~where approved by the Society~~ requirements specified otherwise" in **7.1.2, Part 9 of the Rules** means as follows~~:~~.

(1) In ~~the~~ cases where rubber hoses, ~~t~~Teflon hoses or nylon hoses are used for the following pipes, ~~those~~ only materials approved ~~under the requirements of~~ in accordance with the **Guidance for the Approval and Type Approval of Materials and Equipment for Marine Use** are to be used~~:~~.

(a) Pipes of Group I or Group II

(b) Pipes likely to cause fire or flooding in case of their fracture

(2) ~~In the case where~~ Only plastics pipes (including vinyl pipes) approved by the Society in accordance with **Chapter 6, Part 6 of the Guidance for the Approval and Type Approval of Materials and Equipment for Marine Use** are to be used~~, the requirements specified in the Annex D12.1.6-2 "Guidance for the Survey and Construction of Plastic Pipes" are to be complied with~~.

(3) When aluminium alloy pipes are used, the following requirements are to be complied with:

(a) (Omitted)

(b) (Omitted)

(c) The required thickness of aluminium alloy pipes subject to an internal pressure is to be determined using the formula in **12.2.1-1, Part D of the Rules for the Survey and Construction of Steel Ships**. In this case, allowable stress (f) is to be of the minimum value of the following values. However, when the design temperature is not in the creep region of the material, no consideration may be required for the value of f_3.

$$f_1 = \frac{R_{20}}{4.0},\ f_2 = \frac{E_t}{1.5},\ f_3 = \frac{S_R}{1.6}$$

where:

R_{20} : Specifi~~c~~ed minimum tensile strength (N/mm^2) of the material at room temperature (less than 50°C)

E_t : 0.2% proof stress (N/mm^2) of the material at the design temperature

S_R : Mean value of creep breaking stress (N/mm^2) of the material after 100,000 hours at the design temperature

(4) (Omitted)

EFFECTIVE DATE AND APPLICATION (Amendment 2-3)

1. The effective date of the amendments is 1 July 2022.

2. Notwithstanding the amendments to the Guidance, the current requirements apply to plastic piping systems other than those which fall under the following:

(1) plastic piping systems for which the application for approval of use is submitted to the Society on or after the effective date;

(2) plastic piping systems for which the date of renewal of approval of use is on or after the effective date; or

(3) plastic piping systems used on ships for which the date of contract for construction* is on or after the effective date.

* "contract for construction" is defined in the latest version of IACS Procedural Requirement (PR) No.29.

IACS PR No.29 (Rev.0, July 2009)

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The optional vessels will be considered part of the same series of vessels if the option is exercised not later than 1 year after the contract to build the series was signed.

3. If a contract for construction is later amended to include additional vessels or additional options, the date of "contract for construction" for such vessels is the date on which the amendment to the contract, is signed between the prospective owner and the shipbuilder. The amendment to the contract is to be considered as a "new contract" to which **1.** and **2.** above apply.

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Note:
This Procedural Requirement applies from 1 July 2009.