

RULES FOR THE SURVEY AND CONSTRUCTION OF INLAND WATERWAY SHIPS

GUIDANCE FOR THE SURVEY AND CONSTRUCTION OF INLAND WATERWAY SHIPS

Rules for the Survey and Construction of Inland Waterway Ships
2020 AMENDMENT NO.2
Guidance for the Survey and Construction of Inland Waterway Ships
2020 AMENDMENT NO.2

Rule No.115 / Notice No.64 24 December 2020
Resolved by Technical Committee on 5 August 2020

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 THE SURVEY AND CONSTRUCTION OF INLAND WATERWAY SHIPS

RULES

2020 AMENDMENT NO.2

Rule No.115 24 December 2020

Resolved by Technical Committee on 5 August 2020

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

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

Amendment 2-1

Part 7 MACHINERY INSTALLATIONS

Chapter 4 SHAFTINGS

4.2 Materials, Construction and Strength

4.2.10 Stern Tube Bearings and Shaft Bracket Bearings*

Sub-paragraph -1 has been amended as follows.

1 The aftermost stern tube bearing or shaft bracket bearing which supports the weight of propeller is to comply with the following requirements ~~(1), (2) and to (3):~~

(1) In the case of ~~water oil~~ lubricated bearings of ~~lignum vitae~~.

~~(a) The bearing length is not to be less than 4 times the required diameter of the propeller shaft given by the formula in 4.2.4-1 or -2, or 3 times the actual shaft diameter, whichever is greater.~~

~~(b) Adequate means are to be provided to supply ample amount of clean water for lubrication and cooling.~~

~~(2a)~~ In the case of oil lubricated bearings of white metal.

~~(a)~~ The length of the bearing is not to be less than twice the required diameter of the propeller shaft given by the formulae in either 4.2.4-1 or -2, ~~or 1.5 times the actual diameter, whichever is greater.~~ However, where the nominal bearing pressure (determined by the static bearing reaction calculation taking into account shaft and propeller weight which is deemed to be exerted solely on the aft bearing divided by the projected area of the shaft in way of the bearing, hereinafter defined the same way in this chapter) is not more than 0.8 MPa and special consideration is given on the construction and arrangement in accordance with provisions specified elsewhere and specially approved by the Society, the length of the bearing may be fairly shorter than that specified above. However, the minimum length is to be not less than 1.5 times the actual diameter of the propeller shaft.

~~(b)~~ The stern tube is to be always filled with oil. Adequate means are to be provided to measure the temperature of oil in the stern tube.

~~(c)~~ In cases where a gravity tank supplying lubricating oil to the stern tube bearing is fitted, it is to be located above the designed maximum load line and provided with a low level alarm device. However, in cases where the lubricating system is designed to be used under the condition that the static oil pressure of the gravity tank is lower than the water pressure, the tank is not required to be above the designed maximum load line.

~~(d)~~ The lubricating oil is to be cooled by submerging the stern tube in the water of the after peak tank or by some other suitable means.

- ~~(3) In cases where bearing materials other than (1) and (2) above are intended to be used, the materials, construction and arrangement are to be approved by the Society. The length of these bearings is to comply with the following requirements in (a) and (b):~~
- ~~(a) In the case of oil lubricated bearing of synthetic materials other than white metal.~~
- ~~i) The materials, construction and arrangement are to be approved by the Society.~~
 - ~~ii) For bearings of synthetic rubber, reinforced resin or plastics materials which are approved for use as oil lubricated stern tube bearings, the length of the bearing is to be not less than twice the required diameter of the propeller shaft given by the formulae in either 4.2.4-1 or -2, or 1.5 times the actual diameter, whichever is greater. However, for where the nominal bearing pressure is not more than 0.6 MPa and bearings having a construction and arrangement specially approved by the Society, the length of the bearing may be fairly shorter than that specified above. However, the minimum length is to be not less than 1.5 times the actual diameter of the propeller shaft.~~
 - ~~iii) Notwithstanding the requirement given in ii), the Society may allow use of bearings whose nominal bearing pressure is more than 0.6 MPa where the material has proven satisfactory testing and operating experience.~~
- ~~(b) In the case of water lubricated bearings of synthetic materials.~~
- ~~(a) The materials, construction and arrangement are to be approved by the Society.~~
 - ~~(b) For bearings of synthetic materials which are approved for use as water lubricated stern tube bearings such as rubber or plastics, the length of the bearing is to be not less than 4 times the required diameter of the propeller shaft given by the formulae in either 4.2.4-1 or -2, or 3 times the actual diameter, whichever is greater. However, for bearings having a construction and arrangement specially approved by the Society, the length of the bearing may be fairly shorter than that specified above of synthetic materials, such as rubber or plastics, that are approved for use as water lubricated stern tube bearings and where special consideration is given to their construction and arrangement in accordance with provisions specified elsewhere, the length of the bearing may be fairly shorter than that specified above. However, minimum length is to be not less than twice the required diameter of the propeller shaft given by the formulae in either 4.2.4-1 or -2, or 1.5 times the actual diameter, whichever is greater.~~
- ~~(3) In the case of grease lubricated bearings.~~
- ~~In cases where the actual diameter of the propeller shaft is not more than 100 mm, grease lubricated bearings may be used. The length of the bearing is to be not less than 4 times the required diameter of the propeller shaft given by the formulae in either 4.2.4-1 or -2.~~

EFFECTIVE DATE AND APPLICATION (Amendment 2-1)

1. The effective date of the amendments is 1 January 2021.

Part 7 MACHINERY INSTALLATIONS

Chapter 12 STEERING GEARS

12.3 Controls

Paragraph 12.3.1 has been amended as follows.

12.3.1 General*

1 Steering gear control is to be provided:

- (1) For the main steering gear, both on the navigating bridge and in the steering gear compartment;
- (2) In cases where the main steering gear is arranged in accordance with the requirements in **12.2.1-2**, by two independent control systems, both operable from the navigating bridge. This does not require duplication of the steering wheel or steering lever. In cases where the control system consists of a hydraulic telemotor, a second independent system need not be fitted.

((3) is omitted.)

2 Any main and auxiliary steering gear control system operable from the navigating bridge is to comply with the following:

((1) to (5) are omitted.)

3 For the control systems specified in the requirements of **1(2)** above, at least the following most probable failures that may cause reduced or erroneous system performance are to be automatically detected and individual visible and audible alarms are to be given on the navigation bridge:

- (1) Power supply failure
- (2) Earth fault on AC and DC circuits
- (3) Loop failure in closed loop systems, both command and feedback loops (normally short circuit, broken connections and earth faults)
- (4) Data communication errors
- (5) Programmable system failures (Hardware and software failures)
- (6) Hydraulic locking
- (7) In the case of closed loop systems, deviation between rudder order and feedback

Individual visible and audible deviation alarms are to be initiated on the navigation bridge when the rudder's actual position does not reach its set point within acceptable time limits (e.g., follow-up control and autopilot). The deviation alarm may be caused by mechanical, hydraulic or electrical failures.

4 For the control systems specified in the requirements of **-1(2)** above, the failures (as defined but not limited to those in **D15.3.1-4**) likely to cause uncontrolled movement of the rudder are to be clearly identified. In the event of that failure, following response is to be implemented:

- (1) the rudder is to stop in the angle when failure occurs without manual intervention, or
- (2) the rudder is to return to the midship/neutral position.

35 For the steering gears which are so arranged that more than one system (either power or control) can be simultaneously operated, where hydraulic locking, caused by a single failure, may lead to loss of steering, audible and visual alarms, which identifies the failed system, are to be provided on the navigation bridge.

EFFECTIVE DATE AND APPLICATION (Amendment 2-2)

1. The effective date of the amendments is 1 January 2021.
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.

GUIDANCE FOR THE SURVEY AND CONSTRUCTION OF INLAND WATERWAY SHIPS

GUIDANCE

2020 AMENDMENT NO.2

Notice No.64 24 December 2020

Resolved by Technical Committee on 5 August 2020

AMENDMENT TO THE GUIDANCE FOR THE SURVEY AND CONSTRUCTION OF INLAND WATERWAY SHIPS

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

Amendment 2-1

Part 2 CLASS SURVEYS

Chapter 9 PLANNED MACHINERY SURVEYS

9.1 Planned Machinery Surveys

9.1.2 Continuous Machinery Survey

Sub-paragraph -6(2) has been amended as follows.

6 Confirmatory Survey

In ships deemed by the Society as maintaining their machinery and equipment well, overhaul inspections according to the CMS Program specified in -3 by the shipowner (or the ship management company) may forgo the open-up examination performed in the presence of Surveyors by conducting the following confirmatory surveys, provided that the machinery and equipment are overhauled as part of the ship's maintenance practices and the records from such overhauls are kept in good order. In this case, the due date of the next open-up examination is 6 *years* from the date of its last overhaul and inspection.

((1) is omitted.)

(2) Items applicable to the confirmatory survey

Items of machinery and equipment applicable to the confirmatory surveys are as follows.

- (a) Reciprocating internal combustion engines used as main propulsion machinery
- (b) Reciprocating internal combustion engines used for driving generators, auxiliary machinery essential for main propulsion or auxiliary machinery for manoeuvring and safety of the ship
- (c) Intermediate shafts, thrust shafts and bearings
- (d) Auxiliary machinery (air compressors, pumps, turbines used for driving cargo oil pumps, heat exchangers, air reservoirs, deck machinery and distilling plants)

((3) is omitted.)

EFFECTIVE DATE AND APPLICATION (Amendment 2-1)

1. The effective date of the amendments is 24 December 2020.

Part 7 MACHINERY INSTALLATIONS

Chapter 4 SHAFTINGS

4.2 Materials, Construction and Strength

Paragraph 4.2.10 has been amended as follows.

4.2.10 Stern Tube Bearings and Shaft Bracket Bearings

1 The wording “provisions specified elsewhere ~~and specially approved by the Society~~” in **4.2.10-1(21)(a)i), Part 7 of the Rules** means the following:

~~When the length of a bearing may be is less than twice the required diameter that required in accordance with by 4.2.10-1(21)(a)i), Part 7 of the Rules, the following (1) and (2) are, in principle, to be satisfied. however, the minimum length of the bearing is not to be less than 1.5 times the actual diameter of the propeller shaft.~~

- (1) Shaft alignment calculations are to be carried out in accordance with the requirements in **Annex D6.2.13 “GUIDANCE FOR CALCULATION OF SHAFT ALIGNMENT”, Part D of the Guidance for the Survey and Construction of Steel Ships.**
- (2) For improving the lubricating condition of the bearing, the following measures are to be taken:
 - (a) A lubricating oil inlet is to be provided at the aft end of the bearing to ensure the forced circulation of the lubricating oil.
 - (b) Either of the following devices to measure stern tube bearing metal temperature at the aft end bottom along with high temperature alarms (with a preset value of 60 °C or below) is to be provided:
 - i) Two or more temperature sensors embedded in the metal; or
 - ii) An embedded temperature sensor, replaceable from inboard the ship, and a spare temperature sensor.In this case, the replacement of such sensors according to procedures submitted beforehand is to be demonstrated.
 - (c) Low level alarms are to be provided for lubricating oil sump tanks.

2 The wording “construction and arrangement specially approved by the Society” in **4.2.10-1(31)(ab)ii), Part 7 of the Rules** means the following:

~~When the length of a bearing may be is less than twice the required diameter that required in accordance with by 4.2.10-1(31)(ab)ii), Part 7 of the Rules, the following (1) and (2) are, in principle, to be satisfied. however, the minimum length of a bearing is not to be less than 1.5 times the actual diameter of the propeller shaft.~~

- (1) Nominal bearing pressure ~~(determined by the static bearing reaction divided by the projected area of the shaft in way of the bearing, hereinafter defined the same way in this Chapter), etc.~~ calculated in accordance with **Annex D6.2.13 “GUIDANCE FOR CALCULATION OF SHAFT ALIGNMENT”, Part D of the Guidance for the Survey and Construction of Steel Ships** are to be within the allowable limits specified in the Type Approval Certificate.
- (2) The measures for lubricating condition specified in **-1(2)** are to be taken.

3 The wording “~~construction and arrangement~~ provisions specified elsewhere ~~specially approved by the Society~~” in **4.2.10-1(32)(b), Part 7 of the Rules** means the following:

~~When the length of a bearing may be is less than 4 times the required diameter of the propeller shaft or less than 3 times the actual diameter, whichever is greater, that required in accordance with~~

~~by 4.2.10-1(32)(b), Part 7 of the Rules, the following (1) and (2) are, in principle, to be satisfied. however, the minimum length of a bearing is not to be less than 2 times the required diameter of the propeller shaft given by the formula in 4.2.4-1, Part 7 of the Rules or 1.5 times the actual diameter, whichever is greater.~~

- ~~(1) Nominal bearing pressure, under the assumption that the weight of shaft and propeller are loaded solely on the aftermost bearing,~~ is to be within the allowable limit specified in the Type Approval Certificate.
- (2) Forced lubrication using water pumps is to be adopted and a non-flow alarm is to be provided at the lubricating water inlet.

EFFECTIVE DATE AND APPLICATION (Amendment 2-2)

1. The effective date of the amendments is 1 January 2021.

Part 7 MACHINERY INSTALLATIONS

Chapter 12 STEERING GEARS

12.3 Controls

Paragraph 12.3.1 has been amended as follows.

12.3.1 General

(-1 to -3 are omitted.)

~~4 The control systems specified in the requirements of 12.3.1 1(2), Part 7 of the Rules are to be provided with the following failure detection functions:~~

~~(1) At least the following failures that may cause reduced or erroneous system performance are to be automatically detected and individual visible and audible alarms are to be given on the navigation bridge:~~

~~(a) Power supply failure~~

~~(b) Earth fault on AC and DC circuits~~

~~(c) Loop failure in closed loop systems, both command and feedback loops (normally short circuit, broken connections and earth faults)~~

~~(d) Data communication errors~~

~~(e) Programmable system failures (Hardware and software failures)~~

~~(f) Hydraulic locking~~

~~(g) In the case of closed loop systems, deviation between rudder order and feedback~~

~~Individual visible and audible deviation alarms are to be initiated on the navigation bridge when the rudder's actual position does not reach its set point within acceptable time limits (e.g. follow up control and autopilot). The deviation alarms may be caused by mechanical, hydraulic or electrical failure.~~

~~5 For the control systems specified in the requirements of 12.3.1 1(2), Part 7 of the Rules, the rudder is to be stopped in either of the following positions in cases where a failure (as defined but not limited to those in 12.3.1 4) likely to cause uncontrolled movement of the rudder occurs:~~

~~(1) the rudder angle when failure occurs, or~~

~~(2) the midship/neutral position~~

~~64~~ Amplifiers, relays, etc., included in control systems may also be used for automatic pilot systems.

~~75~~ For electrohydraulic steering gears equipped with power units comprising variable-displacement pumps, two sets each of hydraulic servo cylinders and associated hydraulic systems (including pump driving electric motors and control equipment) or electric servo motors for controlling displacement of pump plungers are to be provided.

~~86~~ In general, the following cases are not considered to be one of the cases “where hydraulic locking, caused by a single failure, may lead to loss of steering” that is specified in 12.3.1-45, Part 7 of the Rules.

(1) Steering systems with performance at least equal to that required for auxiliary steering gear are fitted as stand-by systems and are operable from navigation bridges. In such cases, stand-by systems are to be designed so that they do not run parallel using interlocking devices, etc.

(2) Not less than 3 systems are operated parallel and, in the case of a single failure, steering capability at least equal to that required for auxiliary steering gears is maintained.

- (3) Steering gears designed to avoid leading to any loss of steering by automatically by-passing failed systems using duplicated control valve systems. These arrangements are subject to special consideration with respect to any reduced reliability due to increased complexity.

~~97~~ Those “audible and visual alarms, which identify failed systems” specified in **12.3.1-45, Part 7 of the Rules**, are, in general, to be activated under the following conditions:

- (1) In cases where positions of variable displacement pump control systems do not correctly respond to given commands.
- (2) In cases where incorrect positions of 3-way full flow valves or similar constant delivery pump systems are detected.

~~108~~ The location of sensors for those alarms specified in the aforementioned ~~97~~, are to be as near as possible to actuators. However, in cases where two or more pumps are mechanically interconnected by floating bars or by similar devices, special consideration does not need to be given to their breakage. An example of some acceptable locations of alarm sensors is given in **Fig. 7.12.3.1-4**.

EFFECTIVE DATE AND APPLICATION (Amendment 2-3)

1. The effective date of the amendments is 1 January 2021.
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.