

RULES FOR THE SURVEY AND CONSTRUCTION OF STEEL SHIPS

GUIDANCE FOR THE SURVEY AND CONSTRUCTION OF STEEL SHIPS

Part GF

Ships Using Low-Flashpoint Fuels

Rules for the Survey and Construction of Steel Ships
Part GF **2023 AMENDMENT NO.2**
Guidance for the Survey and Construction of Steel Ships
Part GF **2023 AMENDMENT NO.2**

Rule No.67 / Notice No.63 22 December 2023

Resolved by Technical Committee on 26 January 2022 / 27 July 2023

ClassNK
NIPPON KAIJI KYOKAI

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

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Rule No.67 22 December 2023

AMENDMENT TO 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:

Chapter 2 DEFINITIONS

2.2 Definitions (IGF Code 2.2)

2.2.1 Terms*

Sub-paragraph -44 has been added as follows.

44 “Ship constructed on or after 1 January 2024” means ships that fall under any of the following.

- (1) for which the building contract is placed on or after 1 January 2024;
- (2) in the absence of a building contract, the keels of which are laid or which are at a similar stage of construction on or after 1 July 2024; or
- (3) the delivery of which is on or after 1 January 2028.

Chapter 6 FUEL CONTAINMENT SYSTEM

6.7 Pressure Relief System (IGF Code 6.7)

6.7.1 General

Sub-paragraph -1 has been amended as follows.

1 All fuel storage tanks are to be provided with a pressure relief system appropriate to the design of the fuel containment system and the fuel being carried. Fuel storage hold spaces, interbarrier spaces, and tank connection spaces ~~and tank cofferdams~~, which may be subject to pressures beyond their design capabilities, are also not to be provided with a suitable pressure relief system. Pressure control systems specified in **6.9** are to be independent of the pressure relief systems.

6.8 Loading Limit for Liquefied Gas Fuel Tanks (IGF Code 6.8)

6.8.1 Loading Limit

Sub-paragraph -3 has been added as follows.

1 Storage tanks for liquefied gas are not to be filled to more than a volume equivalent to 98 % full at the reference temperature as defined in **2.2.1-36**. A loading limit curve for actual fuel loading temperatures is to be prepared from the following formula:

$$LL = FL \frac{\rho_R}{\rho_L}$$

LL : loading limit as defined in **2.2.1-27**, expressed in per cent

FL : filling limit as defined in **2.2.1-16** expressed in per cent, here 98 %

ρ_R : relative density of fuel at the reference temperature

ρ_L : relative density of fuel at the loading temperature

2 In cases where the tank insulation and tank location make the probability very small for the tank contents to be heated up due to an external fire, special considerations may be made to allow a higher loading limit than calculated using the reference temperature, but never above 95 %. This also applies in cases where a second system for pressure maintenance is installed, (refer to **6.9**). However, if the pressure can only be maintained / controlled by fuel consumers, the loading limit as calculated in **6.8.1-1** is to be used.

3 Notwithstanding-2 above, for the ships constructed on or after 1 January 2024, in cases where the tank insulation and tank location make the probability very small for the tank contents to be heated up due to an external fire, special consideration may be made to allow a higher loading limit than calculated using the reference temperature, but never above 95 %.

Chapter 9 FUEL SUPPLY TO CONSUMERS

9.5 Fuel Distribution Outside of Machinery Space (*IGF Code 9.5*)

9.5.1 Fuel Pipes*

Where fuel pipes pass through enclosed spaces in the ship, they are to be protected by a secondary enclosure. This enclosure can be a ventilated duct or a double wall piping system. The duct or double wall piping system is to be mechanically underpressure ventilated with 30 air changes per hour, and gas detection as required in **15.8** is to be provided. Other solutions providing an equivalent safety level may also be accepted by the Society.

Title of Paragraph 9.5.2 has been amended as follows.

9.5.2 Fuel Gas Vent Pipes

The requirement in **9.5.1** need not be applied for fully welded fuel gas vent pipes led through mechanically ventilated spaces.

Paragraphs 9.5.3 to 9.5.6 have been added as follows.

9.5.3 Alternative Arrangement

Requirements 9.5.4 to 9.5.6 apply to ships constructed on or after 1 January 2024 in lieu of requirements 9.5.1 and 9.5.2.

9.5.4 Gaseous Fuel Pipes*

Where gaseous fuel pipes pass through enclosed spaces in the ship, they are to be protected by a secondary enclosure. This enclosure can be a ventilated duct or a double wall piping system. The duct or double wall piping system is to be mechanically under pressure ventilated with 30 air changes per hour, and gas detection as required in 15.8 is to be provided. Other solutions providing an equivalent safety level may also be accepted by the Administration.

9.5.5 Fuel Gas Vent Pipes

Requirement 9.5.4 need not be applied to fully welded fuel gas vent pipes led through mechanically ventilated spaces.

9.5.6 Liquefied Fuel Pipes

Liquefied fuel pipes are to be protected by a secondary enclosure able to contain leakages. If the piping system is in a fuel preparation room or a tank connection space, the Administration may waive this requirement. Where gas detection as required in 15.8.1(2) is not fit for purpose, the secondary enclosures around liquefied fuel pipes are to be provided with leakage detection by means of pressure or temperature monitoring systems, or any combination thereof. The secondary enclosure is to be able to withstand the maximum pressure that may build up in the enclosure in case of leakage from the fuel piping. For this purpose, the secondary enclosure may need to be arranged with a pressure relief system that prevents the enclosure from being subjected to pressures above their design pressures.

Chapter 10 POWER GENERATION INCLUDING PROPULSION AND OTHER GAS CONSUMERS

10.3 Internal Combustion Engines of Piston Type (*IGF Code 10.3*)

10.3.1 General*

Sub-paragraph -1 has been amended as follows.

1 The exhaust system is to be equipped with explosion relief ventilation sufficiently dimensioned to prevent excessive explosion pressures in the event of ignition failure of one cylinder followed by ignition of the unburned gas in the system. Ships constructed on or after 1 January 2024 are to comply with the following requirements.

- (1) The exhaust system is to be equipped with explosion relief systems unless designed to accommodate worst case overpressure due to ignited gas leaks or justified by the safety concept of the engine.
- (2) Detailed evaluations of the potential for unburnt gas in exhaust systems are to be undertaken covering the complete system from the cylinders up to the open end.
- (3) The evaluations specified in (2) are to be reflected in the safety concept of the engine.

Chapter 11 FIRE SAFETY

11.3 Fire Protection (*IGF Code 11.3*)

11.3.1 General*

Sub-paragraph -3 has been amended as follows:

3 The space containing fuel containment system is to be separated from the machinery spaces of category A or other rooms with high fire risks. The separation is to be done by a cofferdam of at least 900 mm with insulation of “A-60” class. When determining the insulation of the space containing fuel containment system from other spaces with lower fire risks, the fuel containment system is to be considered as a machinery space of category A, in accordance with **Chapter 9, Part R**. ~~The boundary between spaces containing fuel containment systems is to be either a cofferdam of at least 900 mm or “A-60” class division.~~ For type C tanks, the fuel storage hold space may be considered as a cofferdam.

(1) Notwithstanding the last sentence of -3 above, for ships constructed on or after 1 January 2024, the fuel storage hold space may be considered as a cofferdam provided that:

- (a) the type C tank is not located directly above machinery spaces of category A or other rooms with high fire risk; and
- (b) the minimum distance to the “A-60” boundary from the outer shell of the type C tank or the boundary of the tank connection space, if any, is not less than 900 mm.

Section 11.8 has been added as follows.

11.8 Fuel Preparation Room Fire-Extinguishing Systems (*IGF Code 11.8*)

11.8.1 General

For ships constructed on or after 1 January 2024, fuel preparation rooms containing pumps, compressors or other potential ignition sources are to be provided with a fixed fire-extinguishing system complying with the requirements specified in **Chapter 25 to Chapter 27, Part R** and taking into account the necessary concentrations/application rate required for extinguishing gas fires.

Chapter 14 ELECTRICAL INSTALLATIONS

14.3 General Requirements (*IGF Code 14.3*)

Paragraph 14.3.7 has been amended as follows.

14.3.7 Low-liquid Level Alarm*

Arrangements are to be made to alarm in low-liquid level and automatically shutdown the motors in the event of low-low liquid level. The automatic shutdown may be accomplished by sensing low pump discharge pressure, low motor current, or low-low liquid level. This shutdown is to give an audible and visual alarm on the navigation bridge, continuously manned central control station or onboard safety centre.

Chapter 15 CONTROL, MONITORING AND SAFETY SYSTEMS

15.4 Bunkering and Liquefied Gas Fuel Tank Monitoring (*IGF Code 15.4*)

Paragraph 15.4.10 has been amended as follows.

15.4.10 Protective Devices for Submerged Fuel-pump Motors*

For submerged fuel-pump motors and their supply cables, arrangements are to be made to alarm in low-liquid level and automatically shutdown the motors in the event of low-low liquid level. The automatic shutdown may be accomplished by sensing low pump discharge pressure, low motor current, or low-low liquid level. This shutdown is to give an audible and visual alarm on the navigation bridge, continuously manned central control station or onboard safety centre.

Chapter 16 MANUFACTURE, WORKMANSHIP AND TESTING

16.3 Welding of Metallic Materials and Non-destructive Testing for the Fuel Containment System (with reference to *IGF Code 16.3*)

16.3.3 Welding Procedure Tests for Fuel Tanks and Process Pressure Vessels*

Sub-paragraph -5(1) has been amended as follows.

5 Each test is to satisfy the following:

- (1) Tensile tests: cross-weld tensile strength is not to be less than the specified minimum tensile strength for the appropriate parent materials. For materials such as aluminium alloys, reference is to be made to **6.4.12(1)(a)iii**) with regard to the regulations for weld metal strength of under-matched welds (where the weld metal has a lower tensile strength than the parent metal). In every case, the position of fracture is to be recorded for information;
- ((2) and (3) are omitted.)

EFFECTIVE DATE AND APPLICATION

1. The effective date of the amendments is 1 January 2024.

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AMENDMENT TO THE GUIDANCE FOR THE SURVEY AND CONSTRUCTION OF STEEL SHIPS

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

Amendment 2-1

GF9 FUEL SUPPLY TO CONSUMERS

GF9.5 Fuel Distribution Outside of Machinery Spaces

GF9.5.1 Fuel Pipes

In cases where double wall piping with vacuum used as secondary enclosure is adopted as “other solutions” specified in **9.5.1, Part GF of the Rules**, appropriate means capable of detecting loss of vacuum are to be provided, in addition to applying **2.2.1-37, Part GF of the Rules**.

Paragraph GF9.5.4 has been added as follows.

GF9.5.4 Gaseous Fuel Pipes

In cases where double wall piping with vacuum used as secondary enclosure is adopted as “other solutions” specified in **9.5.4, Part GF of the Rules**, appropriate means capable of detecting loss of vacuum are to be provided, in addition to applying **2.2.1-37, Part GF of the Rules**.

EFFECTIVE DATE AND APPLICATION (Amendment 2-1)

1. The effective date of the amendments is 1 January 2024.

GF11 FIRE SAFETY

GF11.3 Fire Protection

GF11.3.1 General

Sub-paragraph -2 has been amended as follows.

2 In applying **11.3.1-1, Part GF of the Rules**, any enclosed spaces containing equipment for fuel preparation such as pumps or compressors or other potential ignition sources are to be provided with a fixed fire extinguishing system complying with any one of the requirements specified in Chapter 25 to Chapter 27, Part R of the Rules and taking into account the necessary concentrations / application rate required for extinguishing gas fires comply with **11.8.1, Part GF of the Rules**.

EFFECTIVE DATE AND APPLICATION (Amendment 2-2)

1. The effective date of the amendments is 1 January 2024.
2. Notwithstanding the amendments to the Guidance, the current requirements apply to ships other than ships that fall under the following:
 - (1) for which the contract for construction is placed on or after the effective date; or
 - (2) in the absence of a contract for construction, the keels of which are laid or which are at *a similar stage of construction* on or after 1 July 2024; or
 - (3) the delivery of which is on or after 1 January 2028.

(Note) The term “*a similar stage of construction*” means the stage at which the construction identifiable with a specific ship begins and the assembly of that ship has commenced comprising at least 50 *tonnes* or 1% of the estimated mass of all structural material, whichever is the less.

GF10 POWER GENERATION INCLUDING PROPULSION AND OTHER GAS CONSUMERS

GF10.2 Functional Requirements

GF10.2.2 Additional Requirements

Sub-paragraph -1 has been amended as follows.

- 1** In applying **10.2.2-2, Part GF of the Rules**, air inlet manifolds and scavenge spaces which are not capable of withstanding a pressure *7 times* the design pressure are to be provided with pressure relief systems approved by the Society in accordance with **Chapter 6, Part 13 of the Guidance for the Approval and Type Approval of Materials and Equipment for Marine Use.**
- 2** In applying **10.2.2-2, Part GF of the Rules**, pressure relief systems are not to continuously discharge exhaust gas into enclosed spaces.

GF10.3 Internal Combustion Engines of Piston Type

Paragraph GF10.3.1 has been amended as follows.

GF10.3.1 General

- 1** In applying **10.3.1-1, Part GF of the Rules**, explosion relief ventilation provided for exhaust gas manifolds composing exhaust systems are to be approved by the Society in accordance with **Chapter 6, Part 13 of the Guidance for the Approval and Type Approval of Materials and Equipment for Marine Use.**
- 2** An example of means provided to “monitor and detect poor combustion or misfiring” specified in **10.3.1-6, Part GF of the Rules** is sensors fitted to monitor the exhaust gas temperature and the status of knocking.

EFFECTIVE DATE AND APPLICATION (Amendment 2-3)

1. The effective date of the amendments is 1 July 2024.
2. Notwithstanding the amendments to the Guidance, the current requirements apply to internal combustion engines for which the application for approval is submitted to the Society or internal combustion engines installed in 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.