21-440

GUIDANCE FOR THE SURVEY AND CONSTRUCTION OF STEEL SHIPS

Part N Ships Carrying Liquefied Gases in Bulk

Guidance for the Survey and Construction of Steel Ships
Part N **2021 AMENDMENT NO.1**

Notice No.28 30 June 2021
Resolved by Technical Committee on 22 January 2020 / 27 January 2021

ClassNK
NIPPON KAIJI KYOKAI

Notice No.28 30 June 2021
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:

Part N SHIPS CARRYING LIQUEFIED GASES IN BULK

Amendment 1-1

N6 MATERIALS OF CONSTRUCTION AND QUALITY CONTROL

N6.5 Welding of Metallic Materials and Non-destructive Testing

N6.5.5 Production Weld Tests

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

1 Production weld tests are to be in accordance with the requirements specified in **6.5.5**, **Part N** and **Chapter 11**, **Part D of the Rules** and are also to comply with the following requirements:
((1) to (4) are omitted.)
(5) Test specimens
(a) The shape and size of tensile test specimens are to be of the *U*2*A* or *U*2*B* test specimen specified in **Table M3.1**, **Part M of the Rules**.
(b) The shape and size of bend test specimens are to be of the *UB*-1, *UB*-2 and ~~*U*~~*B*-3 test specimens specified in **Table M3.2**, **Part M of the Rules**. For test specimens with a thickness ~~exceeding~~ not less than ~~20~~12 *mm*, side bend test specimens ~~are to~~may be substituted for face bend and root bend test specimens.
(c) Impact test specimens are to be the *U*4 test specimen specified in **Table K2.5**, **Part K of the Rules**. In the impact test, one set of test specimens comprising three pieces are to be taken from every test assembly.
The test specimens are to be taken alternately from the position *A* and from a position among *B* through *E* where the lowest value is recorded in the welding procedure qualification test, shows in **Fig. M4.4**, **Part M of the Rules**. This means that one set of three test specimens are taken from a test assembly at the position *A*, thence other set of three test specimens are taken in the subsequent test assembly from the position among *B* through *E* where the lowest value is recorded, and this procedure is repeated.
((6) to (8) are omitted.)

EFFECTIVE DATE AND APPLICATION (Amendment 1-1)

1. The effective date of the amendments is 30 June 2021.
2. Notwithstanding the amendments to the Guidance, the current requirements apply to tensile tests and bend tests for the butt welds of pipes conducted before the effective date.

Amendment 1-2

N5 PROCESS PRESSURE VESSELS AND LIQUID, VAPOUR, AND PRESSURE PIPING SYSTEMS

N5.4 Design Pressure

Paragraph N5.4.4 has been added as follows.

N5.4.4 Outer Ducts in Gas Fuel Piping Systems

The wording "design pressure of the outer pipe or duct" specified in **5.4.4, Part N of the Rules** means one of the following:

(1) The maximum pressure that can act upon the outer pipe or equipment enclosure after an inner pipe rupture. This pressure is to be documented by suitable calculations taking into account the venting arrangements; or

(2) For gas fuel systems with an inner pipe working pressure greater than 1 *MPa*, the maximum built-up pressure arising in the annular space after an inner pipe rupture. This pressure is to be calculated in accordance with **9.8.2, Part GF of the Rules**.

N5.6 Cargo Transfer Arrangements

Paragraph N5.6.5 has been amended as follows.

N5.6.5 Cargo Sampling Connections

1 The requirements of **5.6.5, Part N of the Rules** are only applicable in cases where a sampling system is fitted on board. Connections used for controlling the atmosphere in cargo tanks during inerting or gassing up, however, are not considered to be cargo sampling connections.

2 For the purpose of **5.6.5, Part N of the Rules**, two valves on the sample inlet are, in general, to be located at least 500 *mm* apart from each other, except where a smaller distance is permitted by the Society.

Paragraph N5.6.6 has been added as follows.

N5.6.6 Cargo Filters

A means to indicate that "filters are becoming blocked" as specified in **5.6.6, Part N of the Rules** and that filter maintenance is required is to be provided for fixed in-line filter arrangements and portable filter installations where dedicated filter housing piping is provided. In cases where portable filters for fitting to manifold presentation flanges are used without dedicated filter housing, no additional arrangements for indicating blockage or facilitating drainage are required if these filters can be visually inspected after each loading and discharging operation.

N5.13 Testing Requirements

N5.13.2 System Testing Requirements

Sub-paragraph -2 has been renumbered to Sub-paragraph -3, and Sub-paragraph -2 has been added as follows.

1 For the purpose of **5.13.2-3, Part N of the Rules**, the leak test of piping systems are to be conducted at a pressure which are 90% of the design pressure of the piping. Test pressures, however,

may be modified when the test is conducted using a liquid which has high leak detecting ability.

2 The wording "maximum pressure at gas pipe rupture" specified in **5.13.2-4, Part N of the Rules** is the maximum pressure to which the outer pipe or duct is subjected after the inner pipe rupture. For testing purposes, it is the same as the design pressure specified in **5.4.4, Part N of the Rules**.

~~**2**~~**3** For the purpose of **5.13.2-5, Part N of the Rules**, tests are to be conducted according to the requirements in **N4.20.3-4** to **-7**.

N6 MATERIALS OF CONSTRUCTION AND QUALITY CONTROL

N6.5 Welding of Metallic Materials and Non-destructive Testing

N6.5.6 Non-destructive Testing

Sub-paragraph -5 has been amended as follows.

5 For the purpose of the requirements in **6.5.6-8**, **Part N of the Rules**, radiographic tests of secondary barriers where the hull structure acts as the secondary barrier are to be carried out for butt welded joints of the double bottom tank top platings and bulkhead platings in addition to the objects of inspections specified in ~~**Annex M1.4.2-3(1) "GUIDANCE FOR NON-DESTRUCTIVE INSPECTIONS ON INTERNAL IMPERFECTIONS OF THE WELDED JOINTS OF HULL CONSTRUCTIONS"**~~ **Chapter 8**, **Part M of the Rules**. Acceptance criteria of radiographic tests are to be in accordance with the requirements specified in ~~**Annex M1.4.2-3(1)**~~ **Chapter 8**, **Part M of the Rules**.

N13 INSTRUMENTATION AND AUTOMATION SYSTEMS

N13.6 Gas Detection Requirements

Paragraph N13.6.4 has been added as follows.

N13.6.4 Oxygen Deficiency Monitoring Equipment

Two oxygen sensors are to be positioned at appropriate locations in the space or spaces containing the inert gas system, in accordance with **Annex 1** "**Guidance for Equipment and Fittings of Ships Carrying Liquefied Gases in Bulk**" and paragraph 15.2.2.4.5.4 of the *FSS Code*, for all gas carriers, irrespective of the carriage of cargo indicated by an "**A**" in column "**f**" of **Table N19.1**.

N16 USE OF CARGO AS FUEL

N16.7 Special Requirements for Gas-fired Internal Combustion Engines

Paragraph N16.7.1 has been amended as follows.

N16.7.1 Arrangements

1 In applying **16.7.1-4, Part N of the Rules**, pressure relief systems are not to continuously discharge exhaust gas into enclosed spaces.

2 A suitable pressure relief system is to be provided for air inlet manifolds, scavenge spaces and exhaust systems which are not designed to accommodate the worst-case overpressure due to ignited gas leaks or justified by the safety concept of the engine. A detailed evaluation regarding the hazard potential of overpressure in air inlet manifolds, scavenge spaces and exhaust systems is to be carried out and reflected in the safety concept of the engine. In the case of crankcases, explosion relief valves, as required in **2.4.3, Part D of the Rules**, are considered suitable for the gas operation of the engine. For engines not covered by **2.4.3, Part D of the Rules**, a detailed evaluation regarding the hazard potential of fuel gas accumulation in the crankcase is to be carried out.

N18 OPERATING REQUIREMENTS

N18.3 Cargo Emergency Shutdown (*ESD*) System

N18.3.1 Cargo Emergency Shutdown (*ESD*) System

Sub-paragraph -7 has been added as follows.

7 In applying **Note 1)d** of **Table N18.1**, a hardware system such as an electric or mechanical interlocking device is to be provided to prevent inadvertent operation of cargo pumps and inadvertent opening of manifold ESD valves.

N18.4 Operating Requirements

Paragraph N18.4.8 has been added as follows.

N18.4.8 Cargo Sampling

The requirements specified in **18.4.8, Part N of the Rules** are to be applied in accordance with **N5.6.5-1**.

EFFECTIVE DATE AND APPLICATION (Amendment 1-2)

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

Amendment 1-3

N8 CARGO TANK VENT SYSTEMS

N8.1 General

Paragraph N8.1.1 has been amended as follows.

N8.1.1 General

For the purpose of the requirements in **8.1.1, Part N of the Rules**, the pressure relief systems of hold spaces and interbarrier spaces ~~is~~are to be in accordance with the following requirements **(1)** to **(3)**:

((1) is omitted.)

(2) The pressure relief systems of hold spaces regarded as the interbarrier space or part thereof ~~is~~are to conform to the requirements in the following **(3)** and **N8.2.2**.

(3) The sizes of interbarrier spaces pressure relief devices ~~is~~are to conform to the following requirements **(a)** to ~~**(c)**~~**(d)**:

((a) to (d) are omitted.)

~~(e) The interbarrier space pressure relief devices specified in the preceding **(a)** to **(c)** are emergency devices for protecting the hull structure from being unduly overstressed in case of a pressure rise in the interbarrier space due to primary barrier failure. Therefore, such devices need not comply with the requirements of **8.2.10** and **8.2.11, Part N of the Rules**.~~

EFFECTIVE DATE AND APPLICATION (Amendment 1-3)

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

2. Notwithstanding the amendments to the Guidance, the current requirements apply to ships for which the date of contract for construction* is before 1 January 2021.

* "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 1-4

Annex 1 GUIDANCE FOR EQUIPMENT AND FITTINGS OF SHIPS CARRYING LIQUEFIED GASES IN BULK

Chapter 1 GENERAL

1.3 Tests

Sub-paragraph -3 has been amended as follows.

3 The tests specified in the preceding **-1** and **-2** are to be conducted at the manufacturing plant. However, when the Society deems appropriate at the request of the manufacturer, part or the whole of the test may be conducted after being installed on board the ship. To implement surveys of shop tests, in lieu of traditional ordinary surveys where the Surveyor is in attendance, the Society may approve survey methods which it considers to be able to obtain information equivalent to that obtained through traditional ordinary surveys.

Annex 2 GUIDANCE FOR DUAL FUEL BOILERS

Chapter 4 TESTS

4.2 Shop Tests

Sub-paragraph -3 has been amended as follows.

3 Tests specified in **-2** above may be substituted with the tests specified in **4.3** when deemed appropriate by the Society. To implement surveys of tests, in lieu of traditional ordinary surveys where the Surveyor is in attendance, the Society may approve survey methods which it considers to be able to obtain information equivalent to that obtained through traditional ordinary surveys.

Annex 3 GUIDANCE FOR HIGH PRESSURE DUAL FUEL ENGINES

Chapter 5 TESTS

5.2 Shop Test

Paragraph 5.2.2 has been amended as follows.

5.2.2 Shop Trials

High pressure DF engines are to be tested as specified in **D2.6.1-3, Part D of the Guidance**. To implement surveys of tests, in lieu of traditional ordinary surveys where the Surveyor is in attendance, the Society may approve survey methods which it considers to be able to obtain information equivalent to that obtained through traditional ordinary surveys.

Annex 4 GUIDANCE FOR LOW PRESSURE DUAL FUEL ENGINES

Chapter 5 TESTS

5.2 Shop Test

Paragraph 5.2.2 has been amended as follows.

5.2.2 Shop Trials

Low pressure DF engines are to be tested as specified in **D2.6.1-2, Part D of the Guidance**. To implement surveys of tests, in lieu of traditional ordinary surveys where the Surveyor is in attendance, the Society may approve survey methods which it considers to be able to obtain information equivalent to that obtained through traditional ordinary surveys.

EFFECTIVE DATE AND APPLICATION (Amendment 1-4)

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