
RULES FOR THE SURVEY AND CONSTRUCTION OF STEEL SHIPS

RULES

Part N

Ships Carrying Liquefied Gases in Bulk

2023 AMENDMENT NO.2

Rule No.67 22 December 2023

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

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

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:

Part N SHIPS CARRYING LIQUEFIED GASES IN BULK

Chapter 2 SHIP SURVIVAL CAPABILITY AND LOCATION OF CARGO TANKS

2.7 Survival Requirements

2.7.1 Survival Requirements (IGC Code 2.7)*

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

2 In any stage of flooding

- (1) The waterline, taking into account sinkage, heel and trim, is to be below the lower edge of any opening through which progressive flooding or downflooding may take place. Such openings are to include air pipes and openings which are closed by means of weathertight doors or hatch covers and may exclude those openings closed by means of watertight manhole covers and watertight flush scuttles, small watertight cargo tank hatch covers which maintain the high integrity of the deck, remotely operated watertight sliding doors, hinged watertight access doors with open/closed indication locally and at the navigation bridge of the quick-acting or single-action type that are normally closed at sea, hinged watertight doors that are permanently closed at sea, and sidescuttles of the non-opening type;

((2) and (3) are omitted.)

Chapter 6 MATERIALS OF CONSTRUCTION AND QUALITY CONTROL

6.5 Welding of Metallic Materials and Non-destructive Testing (*IGC Code 6.5*)

6.5.3 Welding Procedure Tests for Cargo Tanks, Process Pressure Vessels and Secondary Barriers*

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

5 Each test is to satisfy the following requirements:

- (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 **4.18.1(3)** with regard to the requirements 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.

GUIDANCE FOR THE SURVEY AND CONSTRUCTION OF STEEL SHIPS

Part N

Ships Carrying Liquefied Gases in Bulk

GUIDANCE

2023 AMENDMENT NO.2

Notice No.63 22 December 2023

Resolved by Technical Committee on xx 25 January 2023 / 27 July 2023

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 2-1

N4 CARGO CONTAINMENT

N4.20 Construction Processes

N4.20.3 Testing

Sub-paragraph -4 has been amended as follows.

4 In accordance with ~~the requirements~~ in **4.20.3-5** and **5.13.2-5, Part N of the Rules** the following ~~tests~~ **(1)** and **(2)** tests are to be conducted in the ~~attendance~~ presence of the Surveyor to verify the performance of the cargo containment installations and cargo handling equipment:

~~((1) is omitted.)~~

(2) Cargo full loading test

On items given in ~~Table N4.20.3-2 (a) and (b)~~, tests are to be conducted after completion of all the construction work to verify that the cargo containment installations, cargo handling equipment and instrumentation satisfy the design conditions under the fully loaded condition of cargo. ~~However, for this test, the attendance of the Surveyor may be omitted for ships, other than those carrying liquefied methane (LNG) in bulk, whose cargo containment and cargo transfer installations can be regarded as of the same specification of those which have previously been built and tested at the same shipyard.~~ In addition, the documents specified in (c) are to be submitted to the Surveyor. Furthermore, it is acceptable to carry out the items specified in (a) and (b) during gas trials, except for those specified to be carried out during cargo full loading tests.

(a) During loading operations

When attending at first full cargo loading, priority is to be given to latter stages of loading.

i) Verify the satisfactory functionality of the emergency shutdown systems during testing

ii) Satisfactory operation of gas detection systems

iii) Satisfactory operation of cargo tank pressure monitoring systems

iv) Satisfactory operation of interbarrier space and insulation space pressure monitoring systems, as applicable

v) Satisfactory operation of cargo tank temperature monitoring systems

vi) Satisfactory operation of cargo tank level indicating systems

vii) Satisfactory operation of interbarrier space and inner hull temperature monitoring systems, as applicable

viii) Satisfactory operation of cargo compressors

ix) Inert gas generators, if operating

- x) Nitrogen generating plants, if operating
 - xi) Nitrogen pressure control systems for insulation, interbarrier and annular spaces, as applicable
 - xii) Reliquefaction plants, if fitted
 - xiii) Equipment fitted for the burning of cargo vapours such as boilers, engines, gas combustion units, etc., if operating
 - xiv) Examination of on-deck cargo piping systems, including expansion and supporting arrangements
 - xv) Verification and examination of all piping systems, including valves, fittings and associated equipment for handling cargoes or vapours, as specified in **5.13.2-5, Part N of the Rules.**
 - xvi) Advise masters to carry out cold spot examinations of the hull and external insulation during transit voyages to unloading ports and record the results in ship's logbooks
 - xvii) Advise masters to test high-level alarms with liquid cargoes during voyages and record the results in ship's logbooks, when loading conditions permit
 - xviii) Continuous loading rates
- (b) During discharging operations
When attending at first full cargo unloading, priority is to be given to the commencement of unloading.
- i) Examination of on-deck cargo piping systems including expansion and supporting arrangements
 - ii) Review logbook entries of emergency shutdown systems testing prior to commencement of unloading
 - iii) Review cargo logs and alarm reports for cargo tank pressure, temperature and level indicating systems*
 - iv) Satisfactory operation of cargo compressors
 - v) Satisfactory operation of cargo pumps
 - vi) Inert gas generators, if operating
 - vii) Nitrogen generating plants, if operating
 - viii) Nitrogen pressure control systems for insulation, interbarrier and annular spaces, as applicable
 - ix) Review of records for satisfactory operation of reliquefaction plants, if fitted*
 - x) Review of records for equipment fitted for the burning of cargo vapours such as boilers, engines, gas combustion units, etc.
 - xi) On ships fitted with membrane tanks, review records of cofferdam and inner hull temperature sensors to verify their readings are not below the allowable temperature for the selected grade of steel*
 - xii) Cofferdam heating systems, if in operation*
 - xiii) Review logbook entries for cold spot examinations*
 - xiv) Review logbook entries for the testing of high-level alarms with liquid cargoes*
 - xv) Discharging rates
- * These items are to be carried out during cargo full loading tests, not during gas trials.
- (c) Documentation to be requested to the masters
To demonstrate satisfactory functionality of the verifications, the masters are required to arrange and provide surveyors with the following materials:
- i) Trends of cargo tank pressures and temperatures
 - ii) Trends of pressure and temperature distributions of interbarrier spaces and insulation spaces, and temperature distributions of inner hulls, as applicable

- iii) Trends record of performance of cofferdam heating systems, if fitted
- iv) Trends record of nitrogen gas consumption, and whether any abnormalities have been observed
- v) List of any gas alarm activated, if any
- vi) Cargo tanks containment system cold spot inspection statements
- vii) Activation of cargo tanks high-level alarms and overfill protection tests

Sub-paragraph -6 has been amended as follows.

6 The quantities of the real cargo and vapour used in the gas trials and cargo full loading tests referred to in the preceding -4 are to be sufficient to conducting the tests specified in said -4. However, in cases where cargo conditions do not permit operation tests of high level alarms, such tests are to be carried out at the first occasion in which cargo conditions allow for said testing. In such cases, the logbook entries for testing and relevant records are to be reviewed no later than the first Annual Survey specified in 1.1.3-1, Part B of the Rules.

Table N4.20.3-1 has been amended as follows.

Table N4.20.3-1 Test Items at ~~the~~ Gas Trials

Test item	◎:Attendance of the Surveyor ○:Submission of the records	Inspection equipment	Survey item
1. Drying test	○	• Inert gas generator (<i>IGG</i>)	• Dew point • Change of dryness in cargo tanks and hold spaces
2. Inerting test	○	• Inert gas generator	• Operation of the inert gas generator • Measuring of atmosphere in cargo tanks
3. Inert gas purge test using cargo vapour	◎/○	• Cargo vapourizer • Compressor	• Change of O ₂ /temperature of cargo vapour in cargo tanks • Quantity of cargo vapour (or liquid) supply • Capacity of the vapourizer • Capacity of the compressor
4. Cool-down test	◎/○	• Spray pump • Compressor • Cargo piping • Temperature indicators for cargo tank • Spray piping	• Temperature curve of cargo tanks • Inspection of hold spaces/condition of insulation of tanks ¹⁾ (after cool-down) • Cooling condition of spray piping • Cooling condition of cargo piping • Capacity of spray pump • Cargo consumption • Capacity of Compressor (property of return gas) • Temperature/pressure in cargo tank • Shrinkage of cargo tank ²⁾
5. Loading test of cargo liquid	◎/○	• Compressor • Cargo piping related for loading • Level gauge/temperature indicator	• Temperature/pressure level in cargo tanks • Temperature/pressure in hold spaces • Temperature/pressure of cargo liquid/gas at manifolds • Service condition of cargo piping
6. Operation test of cargo pump	◎/○	• All cargo pumps	• Discharge pressure/current of cargo pumps • Liquid level/pressure in cargo tanks • Stripping
7. Operation test of pressure/temperature control system	◎/○	• Depend on the type of controls	• Depend on the type of controls

Notes:

- 1) The Society may approve omission in consideration of the quality control status and manufacturing records of the insulation materials.
- 2) To be verified only in the case of independent tanks.

Table N4.20.3-2 has been deleted.

~~Table N4.20.3-2 Survey Items of Full Loading Test~~

	Survey items
1. At loading operation¹⁾	<ul style="list-style-type: none"> • Continuous loading rate • Proper operation of gas detection systems⁴⁾ • Proper operation of cargo control and monitoring systems such as level gauging equipment, temperature sensors, pressure gauges, cargo pumps, compressors and cargo heat exchangers⁴⁾ • Proper operation of over flow control systems⁵⁾ • Proper operation of nitrogen generating plants or inert gas generators and pressure control systems for insulation, interbarrier and annular spaces⁴⁾ • Proper operation of cofferdam heating systems, if fitted⁴⁾ • Proper operation of reliquefaction plants, if fitted⁴⁾ • Proper operation of equipment fitted for the burning of cargo vapours⁴⁾ • On deck cargo piping system • Topping off process for cargo tanks including proper operation of high level alarms
2. After full loading or during voyage²⁾	<ul style="list-style-type: none"> • Cargo tanks and supports • Hull adjacent to cargo tanks (cold spot) • Insulation capacity of cargo tanks and supports (cold spot) • Atmosphere in hold spaces • Capacity of pressure/temperature indicator
3. At discharging operation³⁾	<ul style="list-style-type: none"> • Emergency shutdown system testing prior to commencement of unloading • Discharging rate • Conditions of related installations such as those listed in 1. • On membrane vessels, verification that the readings of the cofferdam and inner hull temperature sensors are not below the allowable temperature for the selected grade of steel • On deck cargo piping system • Other operation of discharging • Submission/Survey of related records such as cold spot examination records⁶⁾, cargo logs, operation logs of installations related to cargo operations and alarm reports where no attendance during the cargo loaded voyage of 2.

~~Notes:~~

- ~~1) Priority is to be given to latter stages of loading (approximately last 6 hours).~~
- ~~2) May be exempted from the presence of Surveyors. In such cases, each survey item is to be recorded in order that the Surveyors can check this record.~~
- ~~3) Priority is to be given to the commencement of unloading (approximately first 4-6 hours).~~
- ~~4) Overall inspection may be accepted where an installation are not in operation.~~
- ~~5) In case where implementation is difficult, the verification of operation may be made by suitable other method.~~
- ~~6) Surveyors are to check the sampling of cold spot records, if possible.~~

EFFECTIVE DATE AND APPLICATION (Amendment 2-1)

1. The effective date of the amendments is 1 January 2024.
2. Notwithstanding the amendments to the Guidance, the current requirements apply to ships the keel of which were laid or which were at a similar stage of construction before the effective date.
(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.

N16 USE OF CARGO AS FUEL

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

N16.7.1 Arrangements

Sub-paragraph -2 has been amended as follows.

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. Pressure relief systems provided for air inlet manifolds, scavenge spaces and 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. 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.

EFFECTIVE DATE AND APPLICATION (Amendment 2-2)

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.