

Review of Inspection Requirements for Gas Fuel Handling Equipment and Systems

Object of Amendment

Rules for the Survey and Construction of Steel Ships Parts B and N
Guidance for the Survey and Construction of Steel Ships Parts GF and N

Reason for Amendment

With the increased adoption of high-pressure gas fuel engines of the gas injection type, the number of ships equipped with reciprocating pumps has been increasing. However, Chapter 3, Annex 1 of both Part GF and Part N of the Guidance for the Survey and Construction of Steel Ships is based on requirements assuming centrifugal pumps, and reciprocating pumps are not explicitly covered. Therefore, it was decided to amend relevant requirements so as to reflect the current situation.

In addition, Chapter 4, Annex 1 of both Part GF and Part N of the Guidance for the Survey and Construction of Steel Ships specifies requirements for heat exchangers; however, the applicability of these requirements to pressure vessels such as buffer tanks is not clearly specified. Accordingly, it was decided to amend relevant requirements to clearly define the equipment to which they apply.

In conjunction with the above, a separate review of the requirements in both Part GF and Part N of the Rules for the Survey and Construction of Steel Ships also carried out, and it was decided to amend certain requirements for clarification purposes.

Based on the above review, relevant requirements in both Part GF and Part N of the Rules for the Survey and Construction of Steel Ships are amended for clarification purposes.

Outline of the Amendment

The main amendments are as follows:

- (1) Amend Chapter 3, Annex 1 of both Part GF and Part N of the Guidance for the Survey and Construction of Steel Ships Part GF and Part N to include requirements for reciprocating pumps.
- (2) Amend Chapter 4, Annex 1 of both Part GF and Part N of the Guidance for the Survey and Construction of Steel Ships Part GF and Part N to ensure that process pressure vessels are covered by the requirements.
- (3) Amend Annex 1, both Part GF and Part N of the Guidance for the Survey and Construction of Steel Ships to improve clarity of expression and consistency of the requirements.

Effective Date and application

- (1) Chapter 3, Annex 1 both Part GF and Part N of the Guidance for the Survey and Construction of Steel Ships
This amendment applies to ships for which the date of contract for construction is on or after 1 January 2027.
- (2) Chapter 4, Annex 1 of both Part GF and Part N of the Guidance for the Survey and Construction of Steel Ships

Effective date of the amendment is 1 January 2027.

(3) Other

Effective date of the amendment is 1 January 2027.

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

ID:DD26-05

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Amended-Original Requirements Comparison Table
(Review of Inspection Requirements for Gas Fuel Handling Equipment and Systems)

Amended	Original	Remarks			
RULES FOR THE SURVEY AND CONSTRUCTION OF STEEL SHIPS Part B CLASS SURVEYS Chapter 2 CLASSIFICATION SURVEYS 2.3 Alterations 2.3.1 Examinations of Altered Parts*	RULES FOR THE SURVEY AND CONSTRUCTION OF STEEL SHIPS Part B CLASS SURVEYS Chapter 2 CLASSIFICATION SURVEYS 2.3 Alterations 2.3.1 Examinations of Altered Parts*				
Table B2.3 Plans and Documents – Ships Carrying Liquefied Gases in Bulk					
Name*1	Notes	Submission			Maintained On Board
		Approval	Other	Finished Plans (Submission)	Finished Plans (On Board)
(1 to 53 are omitted.)					
54 Plans and documents for gas combustion units	(1) As specified in 1.3(1), Annex 2A, Part N of the Guidance.	○			
	(2) As specified in 1.3(2), Annex 2A, Part N of the Guidance.		○		
55 Plans and documents for high pressure gas fuel led engines	(1) As specified in 1.3 (1) and (3), Annex 16.1.1-2, Part N of the Rules.	⊖			
	(2) As specified in 1.3 (2), Annex 16.1.1-2, Part N of the Rules.		⊖		
5655 Plans and documents for low pressure gas-fuelled engines	(1) As specified in 1.3 (1) and (3), Annex 16.1.1-3, Part N of the Rules.	○	○		
	(2) As specified in 1.3 (2), Annex 16.1.1-3, Part N of the Rules.		○		

Review of requirements

Amended-Original Requirements Comparison Table
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Amended		Original				Remarks
5756	Plans of access to bows of tankers		○			Review of requirements
Notes						
*1 : For ships of not less than 500 <i>gross tonnage</i> engaged in international voyages, it is recommended submitted plans and documents be marked with <i>IMO</i> ship identification numbers.						
*2 : Plans and documents and plans approved by the Society or copies thereto.						
Table B2.5 Plans and Documents – Ships Using Low-flashpoint Fuels						
Name*1	Notes	Submission		Maintained On Board		
		Approval	Other	Finished Plans (On Board)		
(1 to 22 are omitted.)						
23 Plans and documents for high pressure gas fuel led engines	(1) As specified in 1.3(1) and (3), Annex 1.1.3-2, Part GF of the Rules.	⊖				
	(2) As specified in 1.3(2) and (3), Annex 1.1.3-2, Part GF of the Rules.		⊖			
2423 Plans and documents for low pressure gas-fuelled engines	(1) As specified in 1.3(1) and (3), Annex 1.1.3-3, Part GF of the Rules.	○				
	(2) As specified in 1.3(2) and (3), Annex 1.1.3-3, Part GF of the Rules.		○			
(2524 to 6362 are omitted.)						
Notes						
*1 : For ships of not less than 500 <i>gross tonnage</i> engaged in international voyages, it is recommended submitted plans and documents be marked with <i>IMO</i> ship identification numbers.						
*2 : Plans and documents approved by the Society or copies thereto.						

Amended-Original Requirements Comparison Table
(Review of Inspection Requirements for Gas Fuel Handling Equipment and Systems)

Amended	Original	Remarks
RULES FOR THE SURVEY AND CONSTRUCTION OF STEEL SHIPS Part N SHIPS CARRYING LIQUEFIED GASES IN BULK Annex 16.1.1-3 GAS-FUELLED ENGINES Chapter 1 GENERAL 1.3 Drawings and Data The drawings and data to be submitted are as follows. (1) Drawings and data for approval ((a) to (u) are omitted.) (v) Other drawings and data as deemed necessary by the Society according to the type of gas-fuelled engines ((2) and (3) are omitted.)	RULES FOR THE SURVEY AND CONSTRUCTION OF STEEL SHIPS Part N SHIPS CARRYING LIQUEFIED GASES IN BULK Annex 16.1.1-3 GAS-FUELLED ENGINES Chapter 1 GENERAL 1.3 Drawings and Data The drawings and data to be submitted are as follows. (1) Drawings and data for approval ((a) to (u) are omitted.) (v) Other drawings and data as deemed necessary by the Society according to the type of <u>low pressure</u> gas-fuelled engines ((2) and (3) are omitted.)	Review of requirements

Amended-Original Requirements Comparison Table
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Amended	Original	Remarks
GUIDANCE FOR THE SURVEY AND CONSTRUCTION OF STEEL SHIPS Part GF SHIPS USING LOW-FLASHPOINT FUELS Annex 1 GUIDANCE FOR EQUIPMENT AND FITTINGS OF SHIPS USING LOW-FLASHPOINT FUELS Chapter 2 FUEL VAPOUR COMPRESSORS 2.6 Tests and Inspections 2.6.1 Type <u>Approval</u> 1 Each size and type of gas compressor is to be subjected to <u>approval</u> tests in the presence of a Society surveyor and type approved in accordance with Chapter 2, Part 6 of the Guidance for the Approval of Materials and Equipment for Marine Use. 2 The <u>approval</u> testing in the preceding -1 is to be consistent with the applicable standard as applied for the design assessment in 2.3.1. In addition, at least the following (1) to (6) tests and inspections are to be carried out. ((1) to (6) are omitted.)	GUIDANCE FOR THE SURVEY AND CONSTRUCTION OF STEEL SHIPS Part GF SHIPS USING LOW-FLASHPOINT FUELS Annex 1 GUIDANCE FOR EQUIPMENT AND FITTINGS OF SHIPS USING LOW-FLASHPOINT FUELS Chapter 2 FUEL VAPOUR COMPRESSORS 2.6 Tests and Inspections 2.6.1 Type <u>Tests</u> 1 Each size and type of gas compressor is to be subjected to <u>type</u> tests in the presence of a Society surveyor and type approved in accordance with Chapter 2, Part 6 of the Guidance for the Approval of Materials and Equipment for Marine Use. 2 The <u>type</u> testing in the preceding -1 is to be consistent with the applicable standard as applied for the design assessment in 2.3.1. In addition, at least the following (1) to (6) tests and inspections are to be carried out. ((1) to (6) are omitted.)	Terminology alignment Terminology alignment Terminology alignment

Amended-Original Requirements Comparison Table
(Review of Inspection Requirements for Gas Fuel Handling Equipment and Systems)

Amended	Original	Remarks
Chapter 3 FUEL PUMPS 3.1 General 3.1.1 Application 1 The requirements in this chapter apply to submerged type, deepwell type and deck-mounted type centrifugal pumps <u>and reciprocating type pumps</u> according to the requirements in 1.1.3-1, Part GF of the Rules. (-2 is omitted.) 3.3 Materials, Construction and Strength 3.3.1 General 2 For the design assessments of pumps, <i>ISO</i> 13709:2009, <i>ISO</i> 24490:2016 <u>and ISO 13710:2004</u>, as applicable, may be used, or other applicable recognised standards acceptable to the Society may be considered. 3.3.2 Materials 4 The main structural parts of <u>pump</u> specified in this chapter <u>mean generally</u> those <u>as given</u> in the following (1) and (2): (1) <u>Centrifugal type pump</u> (a) <u>Casings</u> (including fuel discharge outlet in the case of deepwell type) (b) <u>Impellers</u> (c) <u>Inducers</u> (d) <u>Shaft and shaft couplings</u>	Chapter 3 FUEL PUMPS 3.1 General 3.1.1 Application 1 The requirements in this chapter apply to submerged type, deepwell type and deck-mounted type centrifugal pumps according to the requirements in 1.1.3-1, Part GF of the Rules. (-2 is omitted.) 3.3 Materials, Construction and Strength 3.3.1 General 2 For the design assessments of pumps, <i>ISO</i> 13709:2009 <u>and ISO</u> 24490:2016, as applicable, may be used, or other applicable recognised standards acceptable to the Society may be considered. 3.3.2 Materials 4 The main structural parts of <u>the pumps</u> specified in this chapter, <u>in general, refer to</u> those in the following (1) <u>to (6)</u>: (1) <u>casings</u> (including fuel discharge outlet in the case of deepwell type), (2) <u>impellers</u>, (3) <u>inducers</u>, (4) <u>shafts and shaft couplings</u>	Outline of Amendment (1) Addition of inspection requirement for reciprocating type pumps Outline of Amendment (1) Outline of Amendment (1)

Amended-Original Requirements Comparison Table
(Review of Inspection Requirements for Gas Fuel Handling Equipment and Systems)

Amended	Original	Remarks
<u>(e) Guide vane</u> <u>(f) Others as designated by the Society according to the structural type</u> <u>(2) Reciprocating type pump</u> <u>(a) Cylinder cover and cylinder liner</u> <u>(b) Valve cover</u> <u>(c) Piston and piston rod / connecting rod</u> <u>(d) Crankshaft and shaft coupling</u> <u>(e) Crankcase</u>	<u>(5) guide vane, and</u> <u>(6) others as required by the Society according to structural type.</u>	
The effective date of the amendment is according to EFFECTIVE DATE AND APPLICATION (B)		

Amended-Original Requirements Comparison Table
(Review of Inspection Requirements for Gas Fuel Handling Equipment and Systems)

Amended	Original	Remarks
3.6 Tests and Inspections 3.6.1 Type <u>Approval</u> 1 Each size and type of pump is to be subjected to <u>approval</u> tests in the presence of a Society surveyor and type approved in accordance with Chapter 2, Part 6 of the Guidance for the Approval of Materials and Equipment for Marine Use. 2 The <u>approval</u> tests specified in -1 above are to be the tests and inspections specified in the following (1) to (6). ((1) to (6) are omitted.) 3.6.2 <u>Shop Tests</u> (-1 is omitted.) 2 The presence of a Society surveyor for the tests and inspections specified in -1, may be omitted upon manufacturer request when the following (1) to (3) are satisfied. (1) Pumps have been approved in accordance with the <u>approval</u> tests specified in 3.6.1-2. ((2) and (3) are omitted.)	3.6 Tests and Inspections 3.6.1 Type <u>Tests</u> 1 Each size and type of pump is to be subjected to <u>type</u> tests in the presence of a Society surveyor and type approved in accordance with Chapter 2, Part 6 of the Guidance for the Approval of Materials and Equipment for Marine Use. 2 The <u>type</u> tests specified in -1 above are to be the tests and inspections specified in the following (1) to (6). ((1) to (6) are omitted.) 3.6.2 <u>Product Inspections</u> (-1 is omitted.) 2 The presence of a Society surveyor for the tests and inspections specified in -1, may be omitted upon manufacturer request when the following (1) to (3) are satisfied. (1) Pumps have been approved in accordance with the <u>type</u> tests specified in 3.6.1-2. ((2) and (3) are omitted.)	Terminology alignment Terminology alignment Terminology alignment Terminology alignment Terminology alignment

Amended-Original Requirements Comparison Table
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Amended	Original	Remarks
Chapter 4 <u>PROCESS PRESSURE VESSELS</u> 4.1 General 4.1.1 Application 1 The requirements in this chapter apply to <u>process pressure vessels</u> in accordance with the requirements in 1.1.3-1, Part GF of the Rules. 2 For the purpose of this chapter, “<u>process pressure vessels</u>” means the pressure vessels specified in GF1.1.3-2, Part GF of the Guidance, including heat exchangers. 4.2 Materials, Construction and Strength 4.2.1 Materials 1 Materials used for <u>the pressure parts of fuel liquids or vapours</u> are to be in accordance with relevant requirements in Part K of the Rules and in 7.4, Part GF of the Rules. 4.3 Tests and Inspections 4.3.2 <u>Shop Tests</u> 1 All <u>process pressure vessels</u> are to be tested in accordance with the requirements in 10.9, Part D of the	Chapter 4 <u>HEAT EXCHANGERS</u> 4.1 General 4.1.1 Application The requirements in this chapter apply to <u>heat exchangers</u> in accordance with the requirements in 1.1.3-1, Part GF of the Rules. (Newly added) 4.2 Materials, Construction and Strength 4.2.1 Materials 1 Materials used for <u>structural parts which come in contact with fuel liquids or vapours</u> are to be in accordance with relevant requirements in Part K of the Rules and in 7.4, Part GF of the Rules. 4.3 Tests and Inspections 4.3.2 <u>Product Inspections</u> 1 All <u>heat exchangers</u> are to be tested in accordance with the requirements in 10.9, Part D of the Rules.	Outline of Amendment (2) Clarification that this chapter is also applicable to pressure vessels such as buffer tanks Outline of Amendment (2) Outline of Amendment (2) Revision to align with the requirements equivalent to 10.2.1-1, Part D of the Rules Terminology alignment Outline of Amendment (2)

Amended-Original Requirements Comparison Table
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Amended	Original	Remarks
Rules. 4.3.3 Test after Installation On Board <u>Process pressure vessels</u> are to be subjected to service tests specified in 16.7.3-5, Part GF of the Rules after installation on board. Chapter 5 VALVES 5.3 Tests and Inspections 5.3.1 Type <u>Approval</u> (Omitted) 5.3.2 <u>Shop Tests</u> (Omitted) Chapter 6 RELIEF VALVES 6.4 Tests and Inspections 6.4.1 <u>Type Approval</u> 1 Relief valves, not including those whose design temperatures are -55_°C or higher, fitted to fuel piping and process piping, are to be subjected to <u>approval</u> tests, and are to be type approved in accordance with Chapter 2, Part 6 of the Guidance for the Approval of Materials and Equipment for Marine Use. The tests are to verify that the	4.3.3 Test after Installation On Board <u>Heat exchangers</u> are to be subjected to service tests specified in 16.7.3-5, Part GF of the Rules after installation on board. Chapter 5 VALVES 5.3 Tests and Inspections 5.3.1 Type <u>Tests</u> (Omitted) 5.3.2 <u>Product Inspections</u> (Omitted) Chapter 6 RELIEF VALVES 6.4 Tests and Inspections 6.4.1 <u>Prototype Tests</u> 1 Relief valves, not including those whose design temperatures are -55°C or higher, fitted to fuel piping and process piping, are to be subjected to <u>prototype</u> tests, and are to be type approved in accordance with Chapter 2, Part 6 of the Guidance for the Approval of Materials and Equipment for Marine Use. The tests are to verify that the	Outline of Amendment (2) Terminology alignment Terminology alignment Terminology alignment Terminology alignment

Amended-Original Requirements Comparison Table
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Amended	Original	Remarks
relief valves possess necessary performance. 2 <u>Approval</u> tests are to be conducted in accordance with test plans approved by the Society. Test plans are to include details of procedures for verifying the following (1) to (9) items depending upon the type of relief valve. Parts of such tests (not including (1), (3), (4) and (5)) may be dispensed with for valves having sufficient service records and deemed appropriate by the Society. ((1) to (9) are omitted.) 6.4.3 <u>Shop Tests</u> Chapter 7 BELLOWS AND EXPANSION JOINTS (For Fuel Piping and Process Piping Systems) 7.3 Tests and Inspections 7.3.1 Type <u>Approval</u> Bellows and expansion joints, not including those used for piping with open pipe ends and installed in fuel tanks, are to be subjected to the <u>approval</u> tests specified in 16.7.2, Part GF of the Rules for each type and are to be type approved in accordance with Chapter 2, Part 6 of the Guidance for the Approval of Materials and Equipment for Marine Use. 7.3.2 <u>Shop Tests</u> (Omitted)	relief valves possess necessary performance. 2 <u>Prototype</u> tests are to be conducted in accordance with test plans approved by the Society. Test plans are to include details of procedures for verifying the following (1) to (9) items depending upon the type of relief valve. Parts of such tests (not including (1), (3), (4) and (5)) may be dispensed with for valves having sufficient service records and deemed appropriate by the Society. ((1) to (9) are omitted.) 6.4.3 <u>Manufacturing Plant Tests</u> Chapter 7 BELLOWS AND EXPANSION JOINTS (For Fuel Piping and Process Piping Systems) 7.3 Tests and Inspections 7.3.1 Type <u>Tests</u> Bellows and expansion joints, not including those used for piping with open pipe ends and installed in fuel tanks, are to be subjected to the <u>type</u> tests specified in 16.7.2, Part GF of the Rules for each type and are to be type approved in accordance with Chapter 2, Part 6 of the Guidance for the Approval of Materials and Equipment for Marine Use. 7.3.2 <u>Product Inspections</u> (Omitted)	Terminology alignment Terminology alignment Terminology alignment Terminology alignment

Amended-Original Requirements Comparison Table
(Review of Inspection Requirements for Gas Fuel Handling Equipment and Systems)

Amended	Original	Remarks
Chapter 8 INERT GAS GENERATOR/STORAGE SYSTEM AND LIQUID NITROGEN TANK 8.2 Inert Gas Generators (<i>IGG</i>) 8.2.5 Shop Tests (Omitted) Chapter 14 OXYGEN CONTENT MEASURING EQUIPMENT 14.4 Tests and Inspections 14.4.1 <u>Prototype</u> Tests for Portable-type Oxygen Content Measuring Equipment (Omitted) 14.4.2 <u>Type Approval</u> for Fixed-type Oxygen Content Measuring Equipment The <u>fixed</u>-type oxygen content measuring equipment is to <u>be subjected to</u> the tests specified in 14.4.4 for each type and are to be type approved in accordance with Chapter 2, Part 6 of the Guidance for the Approval of Materials and Equipment for Marine Use. Such tests, however, are not required in cases where the tests are carried out for individual equipment.	Chapter 8 INERT GAS GENERATOR/STORAGE SYSTEM AND LIQUID NITROGEN TANK 8.2 Inert Gas Generators (<i>IGG</i>) 8.2.5 Shop Tests <u>and Inspections</u> (Omitted) Chapter 14 OXYGEN CONTENT MEASURING EQUIPMENT 14.4 Tests and Inspections 14.4.1 <u>Approval</u> Tests for Portable-type Oxygen Content Measuring Equipment (Omitted) 14.4.2 <u>Approval Tests</u> for Fixed-type Oxygen Content Measuring Equipment <u>Fixed</u>-type oxygen content measuring equipment is to <u>pass</u> the tests specified in 14.4.4 for each type. Such tests, however, are not required in cases where the tests are carried out for individual equipment.	Terminology alignment Terminology alignment Terminology alignment Terminology alignment Clarification that, where individual testing is not carried out, type approval in accordance with the Guidance for the approval of Materials and Equipment for Marine Use is required

Amended-Original Requirements Comparison Table
(Review of Inspection Requirements for Gas Fuel Handling Equipment and Systems)

Amended	Original	Remarks
14.4.3 <u>Tests after Installation On Board</u> (Omitted) Chapter 17 WATER SPRAY SYSTEM 17.5 Tests and Inspection 17.5.1 <u>Prototype</u> Tests for Nozzles (Omitted) 17.5.2 <u>Tests after Installation On Board</u> (Omitted) Chapter 19 MECHANICAL VENTILATION SYSTEMS 19.4 Tests and Inspections 19.4.1 <u>Shop</u> Tests (Omitted)	14.4.3 <u>Shipboard Inspections</u> (Omitted) Chapter 17 WATER SPRAY SYSTEM 17.5 Tests and Inspection 17.5.1 <u>Approval</u> Tests for Nozzles (Omitted) 17.5.2 <u>Shipboard Inspection</u> (Omitted) Chapter 19 MECHANICAL VENTILATION SYSTEMS 19.4 Tests and Inspections 19.4.1 <u>Approval</u> Tests (Omitted)	Terminology alignment Terminology alignment Terminology alignment Terminology alignment

Amended-Original Requirements Comparison Table
(Review of Inspection Requirements for Gas Fuel Handling Equipment and Systems)

Amended	Original	Remarks
Chapter 20 FUEL HOSES 20.5 Tests and Inspections 20.5.1 Type <u>Approval</u> 1 In principle, fuel hoses are to be subjected to the <u>approval</u> tests in -2 for each type and hose bore. In addition, fuel <u>hoses</u> are to be type approved in accordance with Chapter 2, Part 6 of the Guidance for the Approval of Materials and Equipment for Marine Use. 2 <u>Approval</u> test methods are to be in accordance with the following (1) to (6): ((1) to (4) are omitted.) (5) Hose lengths, not including end fittings, for <u>approval</u> tests are to be approximately 1.5 or more times the allowable bend radius. ((6) is omitted.) 3 Hoses subjected to <u>approval</u> tests are not to be used in actual loading/unloading. 20.5.2 <u>Shop Tests</u> (Omitted)	Chapter 20 FUEL HOSES 20.5 Tests and Inspections 20.5.1 Type <u>approval Tests</u> 1 In principle, fuel hoses are to be subjected to the <u>prototype</u> tests in -2 for each type and hose bore. In addition, fuel <u>hose</u> are to be type approved in accordance with Chapter 2, Part 6 of the Guidance for the Approval of Materials and Equipment for Marine Use. 2 <u>Prototype</u> test methods are to be in accordance with the following (1) to (6): ((1) to (4) are omitted.) (5) Hose lengths, not including end fittings, for <u>prototype</u> tests are to be approximately 1.5 or more times the allowable bend radius. ((6) is omitted.) 3 Hoses subjected to <u>prototype</u> tests are not to be used in actual loading/unloading. 20.5.2 <u>Product Inspections</u> (Omitted)	Terminology alignment Terminology alignment Terminology alignment Terminology alignment Terminology alignment

Amended-Original Requirements Comparison Table
(Review of Inspection Requirements for Gas Fuel Handling Equipment and Systems)

Amended	Original	Remarks
Chapter 21 REMOVABLE FUEL HANDLING EQUIPMENT 21.5 Tests and Inspections 21.5.1 <u>Shop Tests</u> (Omitted) 21.5.3 <u>Tests after Installation On Board</u> (Omitted)	Chapter 21 REMOVABLE FUEL HANDLING EQUIPMENT 21.5 Tests and Inspections 21.5.1 <u>Inspections During Manufacturing</u> (Omitted) 21.5.3 <u>Inspections at Installation</u> (Omitted)	 Terminology alignment Terminology alignment

Amended-Original Requirements Comparison Table
(Review of Inspection Requirements for Gas Fuel Handling Equipment and Systems)

Amended	Original	Remarks
GUIDANCE FOR THE SURVEY AND CONSTRUCTION OF STEEL SHIPS Part N SHIPS CARRYING LIQUEFIED GASES IN BULK Annex 1 GUIDANCE FOR EQUIPMENT AND FITTINGS OF SHIPS CARRYING LIQUEFIED GASES IN BULK Chapter 2 CARGO COMPRESSORS 2.6 Tests and Inspections 2.6.1 Type <u>Approval</u> 1 Each size and type of gas compressor is to be subjected to <u>approval</u> tests in the presence of a Society surveyor and type approved in accordance with Chapter 2, Part 6 of the Guidance for the Approval of Materials and Equipment for Marine Use. 2 The <u>approval</u> testing in the preceding -1 is to be consistent with the applicable standard as applied for the design assessment in 2.3.1. In addition, at least the following (1) to (6) tests and inspections are to <u>be carried</u> out. ((1) to (6) are omitted.)	GUIDANCE FOR THE SURVEY AND CONSTRUCTION OF STEEL SHIPS Part N SHIPS CARRYING LIQUEFIED GASES IN BULK Annex 1 GUIDANCE FOR EQUIPMENT AND FITTINGS OF SHIPS CARRYING LIQUEFIED GASES IN BULK Chapter 2 CARGO COMPRESSORS 2.6 Tests and Inspections 2.6.1 Type <u>Tests</u> 1 Each size and type of gas compressor is to be subjected <u>type</u> tests in the presence of a Society surveyor and type approved in accordance with Chapter 2, Part 6 of the Guidance for the Approval of Materials and Equipment for Marine Use. 2 The <u>type</u> testing in the preceding -1 is to be consistent with the applicable standard as applied for the design assessment in 2.3.1. In addition, at least the following (1) to (6) tests and inspections are to <u>becarried</u> out. ((1) to (6) are omitted.)	Terminology alignment Terminology alignment Terminology alignment

Amended-Original Requirements Comparison Table
(Review of Inspection Requirements for Gas Fuel Handling Equipment and Systems)

Amended	Original	Remarks
2.6.2 <u>Shop Tests</u> (-1 is omitted.) 2 The presence of a Society surveyor at the tests and inspections specified in the preceding -1, may be omitted upon manufacturer request when by the following (1) to (3) are satisfied. (1) Gas compressors have been approved in accordance with the <u>approval</u> tests specified in 2.6.1-2. ((2) and (3) are omitted.)	2.6.2 <u>Product Inspections</u> (-1 is omitted.) 2 The presence of a Society surveyor at the tests and inspections specified in the preceding -1, may be omitted upon manufacturer request when by the following (1) to (3) are satisfied. (1) Gas compressors have been approved in accordance with the <u>type</u> tests specified in 2.6.1-2. ((2) and (3) are omitted.)	Terminology alignment Terminology alignment
The effective date of the amendment is according to EFFECTIVE DATE AND APPLICATION (A)		

Amended-Original Requirements Comparison Table
(Review of Inspection Requirements for Gas Fuel Handling Equipment and Systems)

Amended	Original	Remarks
Chapter 3 CARGO PUMPS 3.3 Materials, Construction and Strength 3.3.1 General (-1 is omitted.) 2 For the design assessments of pumps, <i>ISO</i> 13709:2009, <i>ISO</i> 24490:2016 and <i>ISO</i> 13710:2004, as applicable, may be used, or other applicable recognised standards acceptable to the Society may be considered. 3.3.2 Materials (-1 to -3 are omitted.) 4 The main structural parts of pump specified in this Chapter mean generally those as given in the following (1) and (2): (1) <u>Centrifugal type pump</u> (a) Casing (including cargo discharge outlet in the case of deepwell type) (b) Impeller (c) Inducer (d) Shaft and shaft coupling (e) Guide vane (f) Others as designated by the Society according to the structural type (2) <u>Reciprocating type pump</u> (a) <u>Cylinder cover and cylinder liner</u> (b) <u>Valve cover</u> (c) <u>Piston and piston rod / connecting rod</u>	Chapter 3 CARGO PUMPS 3.3 Materials, Construction and Strength 3.3.1 General (-1 is omitted.) 2 For the design assessments of pumps, <i>ISO</i> 13709:2009 and <i>ISO</i> 24490:2016, as applicable, may be used, or other applicable recognised standards acceptable to the Society may be considered. 3.3.2 Materials (-1 to -3 are omitted.) 4 The main structural parts of pump specified in this Chapter mean generally those as given in the following (1) through (6): (1) Casing (including cargo discharge outlet in the case of deepwell type) (2) Impeller (3) Inducer (4) Shaft and shaft coupling (5) Guide vane (6) Others as designated by the Society according to the structural type	Outline of Amendment (1) Addition of inspection requirement for reciprocating type pumps Outline of Amendment (1)

Amended-Original Requirements Comparison Table
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Amended	Original	Remarks
<u>(d) Crankshaft and shaft coupling</u> <u>(e) Crankcase</u>		
The effective date of the amendment is according to EFFECTIVE DATE AND APPLICATION (B)		

Amended-Original Requirements Comparison Table
(Review of Inspection Requirements for Gas Fuel Handling Equipment and Systems)

Amended	Original	Remarks
3.6 Tests and Inspections 3.6.1 Type <u>Approval</u> 1 Each size and type of pump is to be subjected to <u>approval</u> tests in the presence of a Society surveyor and type approved in accordance with Chapter 2, Part 6 of the Guidance for the Approval of Materials and Equipment for Marine Use. 2 The <u>approval</u> tests specified in -1 above are to be the tests and inspections specified in the following (1) to (6). ((1) to (6) are omitted.) 3.6.2 <u>Shop Tests</u> (-1 is omitted.) 2 The presence of a Society surveyor for the tests and inspections specified in the preceding -1, may be omitted upon manufacturer request when the following (1) to (3) are satisfied. (1) Pumps have been approved in accordance with the <u>approval</u> tests specified in 3.6.1-2. ((2) and (3) are omitted.)	3.6 Tests and Inspections 3.6.1 Type <u>Tests</u> 1 Each size and type of pump is to be subjected to <u>type</u> tests in the presence of a Society surveyor and type approved in accordance with Chapter 2, Part 6 of the Guidance for the Approval of Materials and Equipment for Marine Use. 2 The <u>type</u> tests specified in -1 above are to be the tests and inspections specified in the following (1) to (6). ((1) to (6) are omitted.) 3.6.2 <u>Product Inspections</u> (-1 is omitted.) 2 The presence of a Society surveyor for the tests and inspections specified in the preceding -1, may be omitted upon manufacturer request when the following (1) to (3) are satisfied. (1) Pumps have been approved in accordance with the <u>type</u> tests specified in 3.6.1-2. ((2) and (3) are omitted.)	Terminology alignment Terminology alignment Terminology alignment Terminology alignment Terminology alignment

Amended-Original Requirements Comparison Table
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Amended	Original	Remarks
Chapter 4 <u>PROCESS PRESSURE VESSELS</u> 4.1 General 4.1.1 Application This chapter applies to <u>process pressure vessels</u> (including heat exchangers) used for liquid or vapour cargo as referred to in <u>N5.1.2</u>. 4.2 Materials, Construction and Strength 4.2.1 Materials <u>1</u> Materials used for parts subjects to the pressure of cargo liquid or vapour are to conform to the relevant requirements in Part K of the Rules and in Chapter 6, Part N of the Rules. 4.3 Tests and Inspections 4.3.2 <u>Shop Tests</u> <u>1</u> All <u>process pressure vessels</u> are to be tested in accordance with the requirements in 10.9, Part D of the Rules. (-2 is omitted.)	Chapter 4 <u>HEAT EXCHANGERS</u> 4.1 General 4.1.1 Application This chapter applies to heat exchangers used for liquid or vapour cargo. 4.2 Materials, Construction and Strength 4.2.1 Materials <u>1</u> The structural materials in contact with cargo liquid or vapour are to conform to the relevant requirements in Part K of the Rules and in Chapter 6, Part N of the Rules. 4.3 Tests and Inspections 4.3.2 <u>Product Inspections</u> <u>1</u> All <u>heat exchangers</u> are to be tested in accordance with the requirements in 10.9, Part D of the Rules. (-2 is omitted.)	Outline of Amendment (2) Clarification that this chapter is also applicable to pressure vessels such as buffer tanks Outline of Amendment (2) Revision to align with the requirements equivalent to 10.2.1-1, Part D of the Rules Terminology alignment Outline of Amendment (2)

Amended-Original Requirements Comparison Table
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Amended	Original	Remarks
4.3.3 Test after Installation On Board <u>Process pressure vessels</u> are to be subjected to service tests specified in N4.20.3-4 to -7 after installation on board. Chapter 5 VALVES 5.3 Tests and Inspections 5.3.1 Type <u>Approval</u> (Omitted) 5.3.2 <u>Shop Tests</u> (Omitted) Chapter 6 RELIEF VALVES 6.4 Tests and Inspection 6.4.1 <u>Type Approval</u> 1 Relief valves other than those fitted to cargo piping and process piping with a design temperature of -55 °C or above are to be subjected to <u>approval</u> tests to verify that they possess the necessary performance and are to be type approved in accordance with Chapter 2, Part 6 of the Guidance for the Approval of Materials and Equipment for Marine Use.	4.3.3 Test after Installation On Board <u>Heat exchangers</u> are to be subjected to service tests specified in N4.20.3-4 to -7 <u>of the Guidance</u> after installation on board. Chapter 5 VALVES 5.3 Tests and Inspections 5.3.1 Type <u>Test</u> (Omitted) 5.3.2 <u>Product Inspections</u> (Omitted) Chapter 6 RELIEF VALVES 6.4 Tests and Inspection 6.4.1 <u>Prototype Test</u> 1 Relief valves other than those fitted to cargo piping and process piping with a design temperature of -55 °C or above are to be subjected to <u>prototype</u> tests to verify that they <u>are</u> possess the necessary performance and are to be type approved in accordance with Chapter 2, Part 6 of the Guidance for the Approval of Materials and Equipment for Marine Use.	Outline of Amendment (2) Terminology alignment Terminology alignment Terminology alignment Terminology alignment

Amended-Original Requirements Comparison Table
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Amended	Original	Remarks
2 The <u>approval</u> test is to be conducted in accordance with the test plan approved by the Society. In the test plan, details of procedures to verify the following items (1) to (9) are to be specified depending on the type of relief valves. However, part of this test (except for (1), (3), (4) and (5)) for valves having sufficient service records and approved by the Society may be omitted. ((1) to (9) are omitted.) 6.4.3 <u>Shop</u> Tests (Omitted) Chapter 7 EXPANSION JOINTS (For Cargo Piping and Process Piping Systems) 7.3 Tests and Inspections 7.3.1 <u>Type Approval</u> Expansion joints, except for those provided in the piping with open pipe ends and installed in the cargo tanks, are to be subjected to the <u>approval</u> test specified in 5.13.1-2, Part N of the Rules for each type. In addition, such expansion joints are to be type approved in accordance with Chapter 2, Part 6 of the Guidance for the Approval of Materials and Equipment for Marine Use. 7.3.2 <u>Shop</u> Tests (Omitted)	2 The <u>prototype</u> test is to be conducted in accordance with the test plan approved by the Society. In the test plan, details of procedures to verify the following items (1) to (9) are to be specified depending on the type of relief valves. However, part of this test (except for (1), (3), (4) and (5)) for valves having sufficient service records and approved by the Society may be omitted. ((1) to (9) are omitted.) 6.4.3 Tests <u>at Manufacturing Plants</u> (Omitted) Chapter 7 EXPANSION JOINTS (For Cargo Piping and Process Piping Systems) 7.3 Tests and Inspections 7.3.1 <u>Type Test</u> Expansion joints, except for those provided in the piping with open pipe ends and installed in the cargo tanks, are to be subjected to the <u>type</u> test specified in 5.13.1-2, Part N of the Rules for each type. In addition, such expansion joints are to be type approved in accordance with Chapter 2, Part 6 of the Guidance for the Approval of Materials and Equipment for Marine Use. 7.3.2 <u>Product</u> Tests (Omitted)	Terminology alignment Terminology alignment Terminology alignment Terminology alignment Terminology alignment

Amended-Original Requirements Comparison Table
(Review of Inspection Requirements for Gas Fuel Handling Equipment and Systems)

Amended	Original	Remarks
Chapter 8 INERT GAS GENERATOR/STORAGE SYSTEM AND LIQUID NITROGEN TANK 8.2 Inert Gas Generators (<i>IGG</i>) 8.2.5 Shop Tests (Omitted) Chapter 14 OXYGEN CONTENT MEASURING EQUIPMENT 14.4 Tests and Inspection 14.4.1 <u>Prototype</u> Tests for <u>Portable</u>-type Oxygen Content Measuring Equipment (Omitted) 14.4.2 <u>Type</u> Approval for Fixed-type Oxygen Content Measuring Equipment The fixed-type oxygen content measuring equipment is to <u>be subjected to</u> the tests specified in 14.4.4 for each type and is to be type approved in accordance with <u>Chapter 2, Part 6 of the Guidance for the Approval of Materials and Equipment for Marine Use</u>. However, when tests are conducted for individual equipment, no approval may be required for its use.	Chapter 8 INERT GAS GENERATOR/STORAGE SYSTEM AND LIQUID NITROGEN TANK 8.2 Inert Gas Generators (<i>IGG</i>) 8.2.5 Shop Tests <u>and Inspections</u> (Omitted) Chapter 14 OXYGEN CONTENT MEASURING EQUIPMENT 14.4 Tests and Inspection 14.4.1 <u>Approval</u> Tests for <u>Portage</u>-type Oxygen Content Measuring Equipment (Omitted) 14.4.2 <u>Approval Tests</u> for Fixed-type Oxygen Content Measuring Equipment The fixed-type oxygen content measuring equipment is to <u>pass</u> the tests specified in 14.4.4 for each type. However, when tests are conducted for individual equipment, no approval may be required for its use.	Terminology alignment Terminology alignment Terminology alignment Terminology alignment Clarification that, where individual testing is not carried out, type approval in accordance with the Guidance for the approval of Materials and Equipment for Marine Use is required

Amended-Original Requirements Comparison Table
(Review of Inspection Requirements for Gas Fuel Handling Equipment and Systems)

Amended	Original	Remarks
14.4.3 <u>Tests after Installation On Board.</u> (Omitted) Chapter 17 WATER SPRAY SYSTEM 17.5 Tests and Inspection 17.5.1 <u>Prototype</u> Tests for Nozzles (Omitted) 17.5.2 <u>Test after Installation On Board</u> (Omitted) Chapter 19 MECHANICAL VENTILATION SYSTEM 19.4 Tests and Inspection 19.4.1 <u>Prototype</u> Tests (Omitted)	14.4.3 <u>Shipboard Inspection</u> (Omitted) Chapter 17 WATER SPRAY SYSTEM 17.5 Tests and Inspection 17.5.1 <u>Approval</u> Tests for Nozzles (Omitted) 17.5.2 <u>Shipboard Inspection</u> (Omitted) Chapter 19 MECHANICAL VENTILATION SYSTEM 19.4 Tests and Inspection 19.4.1 <u>Approval</u> Tests (Omitted)	Terminology alignment Terminology alignment Terminology alignment Terminology alignment

Amended-Original Requirements Comparison Table
(Review of Inspection Requirements for Gas Fuel Handling Equipment and Systems)

Amended	Original	Remarks
Chapter 20 CARGO HOSES 20.5 Tests and Inspection 20.5.1 Type <u>Approval</u> 1 In principle, cargo hoses are to be subjected to the <u>approval</u> tests in -2 for each type and hose bore and are to be type approved in accordance with Chapter 2, Part 6 of the Guidance for the Approval of Materials and Equipment for Marine Use. 2 The <u>approval</u> test is to conform to the following requirements (1) to (6): ((1) to (6) are omitted.) 3 The hoses subjected to the <u>approval</u> test are not to be used in actual cargo operation. 20.5.2 <u>Type Approval</u> (Omitted)	Chapter 20 CARGO HOSES 20.5 Tests and Inspection 20.5.1 Type <u>approval Tests</u> 1 In principle, cargo hoses are to be subjected to the <u>prototype</u> tests in -2 for each type and hose bore and are to be type approved in accordance with Chapter 2, Part 6 of the Guidance for the Approval of Materials and Equipment for Marine Use. 2 The <u>prototype</u> test is to conform to the following requirements (1) to (6): ((1) to (6) are omitted.) 3 The hoses subjected to the <u>prototype</u> test are not to be used in actual cargo operation. 20.5.2 <u>Product Inspection</u> (Omitted)	Terminology alignment Terminology alignment Terminology alignment Terminology alignment Terminology alignment
Chapter 21 REMOVABLE CARGO HANDLING EQUIPMENT 21.5 Tests and Inspection 21.5.1 <u>Shop Tests</u> (Omitted)	Chapter 21 REMOVABLE CARGO HANDLING EQUIPMENT 21.5 Tests and Inspection 21.5.1 <u>Inspection during Manufacture</u> (Omitted)	Terminology alignment

Amended-Original Requirements Comparison Table
(Review of Inspection Requirements for Gas Fuel Handling Equipment and Systems)

Amended	Original	Remarks
21.5.3 <u>Tests after Installation On Board</u> (Omitted)	21.5.3 <u>Inspection at Installation</u> (Omitted)	Terminology alignment
The effective date of the amendment is according to EFFECTIVE DATE AND APPLICATION (A)		
EFFECTIVE DATE AND APPLICATION (A) 1. The effective date of the amendments is 1 January 2027. EFFECTIVE DATE AND APPLICATION (B) 1. The effective date of the amendments is 1 January 2027. 2. Notwithstanding the amendments, the current requirements apply to ships for which the date of contract for construction is before the effective date.		