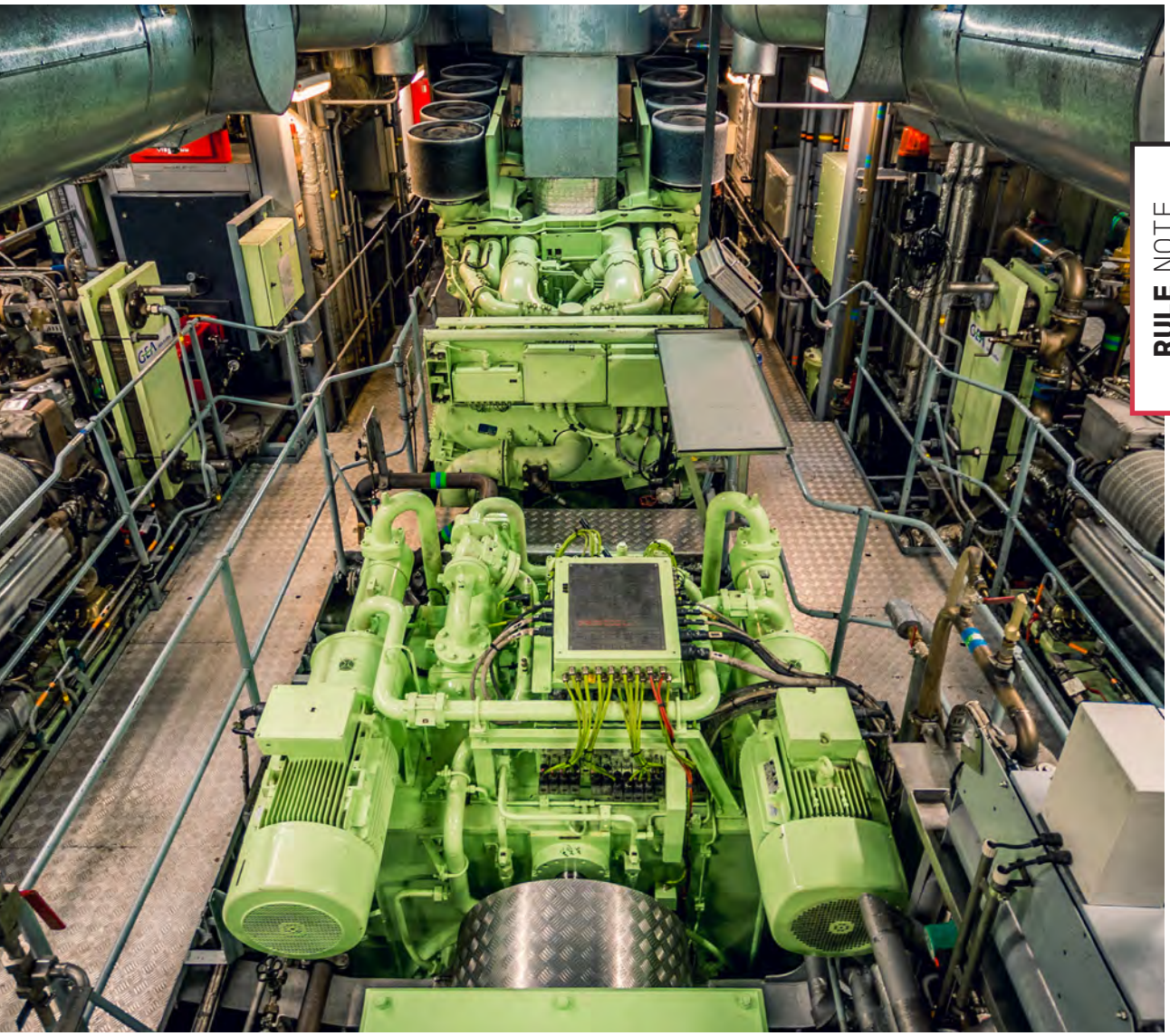
NR266 DT R07 MAY 2023

REQUIREMENTS FOR SURVEY OF MATERIALS AND EQUIPMENT FOR THE CLASSIFICATION OF SHIPS AND OFFSHORE UNITS

NR266 - MAY 2023



RULE NOTE

BUREAU VERITAS

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RULES, RULE NOTES AND GUIDANCE NOTES

NR266 DT R07 May 2023 takes precedence over previous revision.

The PDF electronic version of this document available at the Bureau Veritas Marine & Offshore website https://marine-offshore.bureauveritas.com/ is the official version and shall prevail if there are any inconsistencies between the PDF version and any other available version.

These rules are provided within the scope of the Bureau Veritas Marine & Offshore General Conditions, enclosed at the end of Part A of NR467, Rules for the Classification of Steel Ships. The current version of these General Conditions is available at the Bureau Veritas Marine & Offshore website.

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NR266

REQUIREMENTS FOR SURVEY OF MATERIALS AND EQUIPMENT FOR THE CLASSIFICATION OF SHIPS AND OFFSHORE UNITS

May 2023

Table of Content

Section 1 General

1 Scope of application

1.1 Purpose

1.1.1 Rule Note NR266 summarizes the certification requirements for materials and equipment (generally referred to as «products») which are covered by the class and used or fitted on board the following units:

- Ships surveyed by the Society during construction in accordance with NR467 Rules for the Classification of Steel Ships,
- Offshore units surveyed by the Society during construction in accordance with NR445 Rules for the Classification of Offshore Units, and
- Naval ships surveyed by the Society during construction in accordance with NR483 Rules for the Classification of Naval Ships,

unless otherwise specified therein.

2 Application

2.1 General

2.1.1 The requirements for materials and equipment covered by the class and used or fitted on board are given in the relevant parts of:

- NR467 Rules for the Classification of Steel Ships,
- NR445 Rules for the Classification of Offshore Units,
- NR483 Rules for the Classification of Naval Ships,

as applicable.

2.1.2 In case of inconsistency, the requirements of the applicable Classification Rules for the concerned unit prevail over the provisions of the present NR266.

2.1.3 The certification scheme of materials and equipment covered by the Class is given in NR320 Certification Scheme of Materials and Equipment for the Classification of Marine Units.

2.1.4 In the case of a discrepancy between the provisions of the applicable International and National Statutory Regulations and those of the Society's Rules, the former takes normally precedence. A valid certification to MED 2014/90/EU is to be recognised for classification purpose.

2.1.5 The Society reserves the right to modify the requirements given in the present NR266 to formulate new ones or to change their application in order to take into account the particulars of a given construction, as well as local circumstances.

2.1.6 The particular conditions and requirements expressed by National Flag Authorities, owners, shipyards or manufacturers may lead to additional surveys or other services to be specified and agreed in each case by the concerned parties.

2.1.7 Shipboard tests or tests on board (both at the moorings and during trials) are not covered by this NR266 and are additional to the workshop tests. Refer to relevant provisions of NR467, NR445 or NR483 regarding shipboard tests, i.e. see NR467, Pt C, Ch 1, Sec 15 for Machinery systems (typical).

2.2 Explanatory notes, symbols and abbreviations

2.2.1 Symbols used in the tables implemented in Section 2 have the following meaning:

"C" indicates that a BV product certificate is required with invitation of the Surveyor to attend the tests unless otherwise agreed, in addition to the manufacturer's document stating the results of the tests performed and/or compliance with the approved type as applicable.

"W" indicates that a manufacturer's document is required, stating the results of the tests performed and/or stating compliance with the approved type (as applicable). Also see item O (General) regarding acceptance of Works certificate "W": Manufacturer's document (i.e. material inspection certificates type EN 10204 - 3.1).

"X" indicates that examinations and tests are required.

Where fitted, each additional index (h, ndt) indicates a specific type of test:

h : Hydraulic pressure test (or equivalent)

ndt : Non-destructive tests as per Rules.

2.2.2 Column 1 (item code)

Column 1 contains an alpha-numeric code for ease of reference equipment or component.

2.2.3 Column 2 (item name)

Column 2 contains the name of the equipment or component with, eventually, its sub-systems.

2.2.4 Column 3 (design assessment/approval index)

Column 3 contains the design assessment / approval index. The meaning of letters TA and DA is the following:

TA : Type Approval is required

TA (HBV): Type Approval is required with work's recognition (HBV scheme as per NR320)

DA : Design assessment / Appraisal of the product is required; this one may be carried out as applicable:

- either for a specific unit, or
- using the Type Approval procedure.

Note 1: Where nothing is mentioned in column 3, a design assessment/approval of the specific unit is not required (or the unit is a sub-system whose DA is already addressed within the scope of the Main system approval).

2.2.5 Column 4 (raw material certificate)

Column 4 indicates the nature of the document that is to be submitted by the manufacturer or supplier of the concerned raw material. Consistently with the Rules or agreed specifications, this document includes data such as material tests (chemical composition and mechanical properties), non-destructive tests and surface hardness (if hardened).

2.2.6 Column 5 (examination and testing)

Column 5 indicates that examination and/or testing are required, and are to be carried out by the manufacturer. For the type of examination and/or testing required, reference is to be made to the relevant provisions of NR467, NR445 or NR483.

Note 1: As a general rule, even if a cross "X" is not fitted in a cell under column 5, examination and tests during fabrication may be required with invitation/attendance of the Society's Surveyor.

2.2.7 Column 6 (product certificate)

Column 6 indicates the nature of the document to be supplied by the manufacturer of the concerned product.

2.2.8 Column 7 (remarks)

Column 7 indicates the remarks (if any) associated to the concerned equipment or component.

2.3 Notice regarding columns 3 to 7 (product certification)

2.3.1 Column 3, column 4, column 5 column 6 and column 7 summarize the product certification process or steps to be completed by the manufacturer within the scope of Survey of Materials and Equipment at Works by the Society.

2.4 Notice regarding electrical equipment

2.4.1 Due to the great variety of electrical equipment (item K), it has not been possible to give herewith the details of the surveys to which this electrical equipment is to be submitted. For certain given types of equipment, special type tests leading to their approval are required; the programmes for such type tests are set up for each category of equipment, together with the requirements for their carrying out, and the conditions of validity of the Type approval certificate are given in the relevant provisions of NR467, NR445 or NR483.

As defined in NR467, Pt C, Ch 2, Sec 1, the auxiliaries considered as essential are typically as follows:

a) Equipment for **primary 'essential services'** (services which need to be maintained in continuous operation):

- steering gear
- actuating systems of controllable pitch propellers
- scavenging air blowers, fuel oil supply pumps, fuel valve cooling pumps, lubricating oil pumps and cooling water pumps for main and auxiliary engines and turbines necessary for the propulsion
- forced draught fans, feed water pumps, water circulating pumps, condensate pumps, oil burning installations, for steam plants or steam turbines ship, and also for auxiliary boilers on ship where steam is used for equipment supplying primary essential services
- azimuth thrusters which are the sole means for propulsion/steering with lubricating oil pumps, cooling water pumps
- electrical equipment for electric propulsion plant with lubricating oil pumps and cooling water pumps

- electric generators and associated power sources supplying the above equipment
- hydraulic pumps supplying the above equipment
- viscosity control equipment for heavy fuel oil
- control, monitoring and safety devices/systems for equipment for primary essential services
- speed regulators dependent on electrical energy for main or auxiliary engines necessary for propulsion
- starting equipment of diesel engines and gas turbines.

The main lighting system for those parts of the ship normally accessible to, and used by, personnel and passengers is also considered (included as) a primary essential service.

b) Equipment for **secondary 'essential services'**:

1) Services which need not necessarily be in continuous operation:
   - windlasses
   - Towing equipment
   - thrusters
   - fuel oil transfer pumps and fuel oil treatment equipment
   - lubrication oil transfer pumps and lubrication oil treatment equipment
   - preheaters for heavy fuel oil
   - sea water pumps
   - starting air and control air compressors
   - bilge, ballast and heeling pumps
   - fire pumps and other fire-extinguishing medium pumps
   - ventilation fans for engine and boiler rooms
   - services considered necessary to maintain dangerous cargo in a safe condition
   - navigation lights, aids and signals
   - internal safety communication equipment
   - fire detection and alarm systems
   - electrical equipment for watertight closing appliances
   - electric generators and associated power supplying the above equipment
   - hydraulic pumps supplying the above mentioned equipment
   - control, monitoring and safety for cargo containment systems
   - control, monitoring and safety devices/systems for equipment for secondary essential services
   - cooling system of environmentally controlled spaces.

2) Services for maintaining conditions of habitability for people on board:
   - cooking
   - heating
   - domestic refrigeration
   - mechanical ventilation
   - sanitary and fresh water
   - electric generators and associated power sources supplying the above equipment.

In the case of installations to be granted an additional class notation, all the electrical equipment used for these installations is to be considered as assuming an 'essential service'; such is to be the case, for example, of driving motors for compressors of refrigerating plants constructed and surveyed by the Society, lifting appliances for ships classed with **ALP** or **ALM** notations, etc.

The Society reserves the right to add other auxiliaries to this list, whenever deemed necessary and more especially for installations of peculiar type.

2.5 Notice regarding welded equipment

2.5.1 Welding specifications and Welding Procedure Qualification Records are to be compliant to NR216 Rules on Materials and Welding for the Classification of Marine Units.

2.5.2 Welder qualifications are to be compliant to NR476 Approval Testing of Welders.

2.5.3 Non destructive tests when not performed by the manufacturer are to be carried out by supplier approved against NR669 Recognition of Non-Destructive Testing Suppliers.

Section 2 Equipment and Materials Certification Requirements

1 Summary (tables)

1.1 Foreword

1.1.1 The materials and equipment are organized in different families labelled "Item" followed by a letter (**A** to **V**), and a number for its sub-items where applicable; this constitutes an alphanumeric code for ease of reference equipment or component as specified in Section 1 of this NR266.

For each "Item" (and its sub-items where applicable), the certification requirements are summarized in a corresponding table. These tables are not to be considered as an alternative or a substitute to the applicable Classification Rule requirements. Materials or equipment which are not considered in these tables are to be dealt with as per relevant provisions of applicable Classification Rules and/or as per criteria set up in agreement with the Society.

Item	Title
A	Raw materials and components for hull, machinery and cargo equipment
B	Hull outfittings
C	Fire protection, detection and extinction systems
D	Cargo environmental control, IG (inert gas) systems
E	Main diesel engines and their auxiliaries
F	Main turbines, main boilers, and their auxiliaries
G	Auxiliary machinery
H	Cargo handling and containment systems of liquefied gas carriers
I	Cargo handling and containment systems of oil / FLS tankers or chemical tankers
J	Fire fighting ships
K	Electrical equipment
L	Specific equipment for offshore units
M	Refrigerating installation covered by additional class notations **REF** (**REF-CARGO**, **REF-CONT**, **REF-STORE**
N	Automation systems covered by additional class notations **AUT**
O	Lifting appliances for ships and offshore units
P	Container lashing equipment for ships with additional class notation **LASHING**
Q	Installations covered by additional class notation **SPM** (Single point mooring)
R	Installations covered by additional class notation **DYNAPOS** (Dynamic positioning)
S	Pollution prevention installation covered by additional class notations **CLEANSHIP** (**CLEANSHIP**, **CLEANSHIP SUPER**, and other notations)
T	Availability of machinery covered by additional class notations **AVM** (**AVM-APS**, **AVM-DPS**, **AVP-IPS**)
U	Stainless or high alloy steel for membrane of liquefied gas fuel ships
V	Integrated communication, monitoring and digital systems

Item A - Raw Materials and Components for Hull, Machinery and Cargo Equipment

RAW MATERIALS AND COMPONENTS FOR HULL, MACHINERY AND CARGO EQUIPMENT - ITEM A						
No.	Item	Product certification				Remarks
		Design assessment / Approval	Raw material certificate	Examination and testing	Product certificate	
A1	Steel plates, profiles, bars and pipes for main structure	(1)	C (1)		(2)	(1) Approval as per NR216 and NR480, as applicable (2) See raw material certification
A2	Aluminium alloy plates, profiles, bars and pipes for main structure	(1)	C (1)		(2)	(1) Approval as per NR216 and NR480, as applicable (2) See raw material certification
A3	Filler products for welding (welding consumables)	TA (1)			W	(1) Type approval as per NR216
A4	Aluminium alloy rivets for main structure and fixation of aluminium alloy superstructures on steel hull	(1)	C (1)		(2)	(1) Approval as per NR216, as applicable (2) See raw material certification
A5	Transition joints steel / aluminium alloy for fixation of superstructures on steel hull	TA (1)	C		C	(1) Approval as per NR216 and NR480
A6	Stem, stern post, rudder horn skegs and solid rudder pieces in forged or cast steel (1)	DA	C	X ndt	C	(1) Rudders in composite materials: also see provisions of NI590
A7	Cast steel shaft-brackets	DA	C	X ndt	C	
A8	Composite materials	DA (1)		X (2)	C / W (3)	(1) DA for structural assembly; as per NR467. Also see provisions of NR546 - Hull in composite Materials and Plywood, Material Approval, Design Principles, Construction and Survey (2) A representative sample of the structural assembly is to be tested and qualified as per agreed program; relevant tests to be carried out by a testing laboratory accepted by the Society (3) Document type according to the agreed survey scheme - as per conditions set in the DA (4) Type approval or case-by-case approval by the Society; see provisions of NR546, Section 11
	• Adhesives intended for marine structural applications	TA (HBV) (4)			W	
	• Reinforcement fibres	TA (HBV) (4)			W	
	• Resin systems	TA (HBV) (4)			W	
	• Core materials for sandwiches	TA (HBV) (4)			W	
A9	Aluminium alloy castings	(1)	C (1)		(2)	(1) Approval as per NR216, as applicable (2) See raw material certification

RAW MATERIALS AND COMPONENTS FOR HULL, MACHINERY AND CARGO EQUIPMENT - ITEM A						
No.	Item	Product certification				Remarks
		Design assessment / Approval	Raw material certificate	Examination and testing	Product certificate	
A10	Steel castings for hull structure	(1)	C (1)		(2)	(1) Approval as per NR216, Ch 6, Sec 10, as applicable. Manufacturers of steel castings are to be recognised by the Society in accordance with NR320. The manufacturing process is to be approved in accordance with NR480 for steel castings having a mass above 1000Kg (2) See raw material certification
A11	Steel forgings for hull structure	(1)	C (1)		(2)	(1) Approval as per NR216, Ch 5, Sec 2, as applicable. Manufacturers of steel castings are to be recognised by the Society in accordance with NR320. The manufacturing process is to be approved in accordance with NR480 for steel castings having a mass above 1000Kg (2) See raw material certification
A12	Pod housing for azipod steering system	DA	C	X ndt	C	
A13	Thruster tunnel for transverse tunnel thruster system	DA	C	X ndt	C	
A14	Glass for windows and side scuttles	(1)	C (1)		(2)	(1) Approval as per NR216. Manufacturers of glass panes are to be recognised by the Society in accordance with NR320 (2) See raw material certification
A15	Steel casting for machinery and cargo equipment (1)	DA (2)	C (2)		(3)	(1) When not addressed in other tables. (1) Approval as per NR216. (2) See raw material certification
A16	Aluminium castings	DA (1)	C (1)		(2)	(1) Approval as per NR216. (2) See raw material certification

Item B - Hull Outfittings

HULL OUTFITTINGS - ITEM B						
No.	Item	Product certification				Remarks
		Design assessment / Approval	Raw material certificate	Examination and testing	Product certificate	
B1	Steering gears	DA		X	C	(1) Pumps belonging to class I piping system. See item **G31** (2) Type tests of hydraulic pumps, as per NR467 (3) For hydraulic pump casings (4) Proof loading of steering chains and rods (5) To comply with class I piping system. See item **G26** (6) See also items **G30** (Pressure vessels) and **G42** (Hydraulic systems) Note: Running tests - under load on board
	1- Pumps (hydraulic pumps)	TA or DA (1) (2)	C (3)	X h	C	
	2- Cylindrical shell of hydraulic cylinders, rotor housing for rotary vane steering gear		C	X h ndt	C	
	3- Rams, piston rods		C	X	C	
	4- Tiller, rotor for rotary vane steering gear, quadrant, steering chains and rods		C	X ndt (4)	C	
	5- Piping system and components (5) (6)					
B2	Rudder (1)	DA				(1) Rudders in composite materials: also see provisions of NI590 (2) Hydraulic nut/piston to be considered on a case-by-case basis, as per technology (not a structural part for the integrity of the Rudder, except in case the connection blade/stock is a key connection without self keeping cone; in this configuration, the nut holds the full weight of the blade and the force is transmitted through the thread to the stock) (3) For streamlined rudder blade of watertight construction
	1- Rudder stock, rudder shaft, pintles, coupling bolts, hydraulic nut/piston (2)		C	X ndt	C	
	2- Rudder blade		C	X h (3)	C	
B3	Bower anchors	DA (1) or TA (2)	C	X ndt	C	(1) DA for ordinary anchors (2) TA for High holding power (HHP) and very high holding power (VHHP) anchors. Refer to NR467 and NR216
B4	Anchor chain cable	(1)	C (2)	X ndt (3)	C	(1) Approval as per NR216 and NR480 (2) Approval as per NR216 and NR480 for round bars in grades Q2 or Q3 (3) Marking of chain cables as per NR216, Ch 10, Sec 2. Chain cables which meet the requirements are to be stamped at both ends of each length at least with the following marks: chain cable grade, certificate number, Society's stamp.
B5	Anchor chain cable accessories (shackles, kenter shackles and swivels)	(1)	C	X ndt	C	(1) Approval as per NR216 and NR480

HULL OUTFITTINGS - ITEM B						
No.	Item	Product certification				Remarks
		Design assessment / Approval	Raw material certificate	Examination and testing	Product certificate	
B6	Motorized windlasses	TA/DA (1)		X (2)	C	(1) Or assessment by the mean of type tests according to special conditions. Ref. NR626 - Rule Note for Anchor windlass (2) Refer to relevant provisions of NR626, Section 1, as amended (3) See item **G26** (Piping) and **G42** (Hydraulic systems) (4) For electric systems (motors, switchboards, starter cabinets, alarm panels, etc.), refer to the relevant provisions of item **K**; for the other systems, refer to the relevant provisions of this NR266, of NR626, and of NR467 Note: Alternative test methods subject to Society's acceptance / Anchoring tests / load tests on board, as per agreed program - Refer to NR626
	1- Main shaft	DA	C	X ndt	C	
	2- Casing or body, drum / gipsy-wheel, and main load-bearing structures	DA	C	X ndt	C	
	3- Hydraulic systems, Electric systems (3) (4)	DA		X h	C	
	4- Chain stopper (wire stopper)	DA	C	X ndt	C	
	5- Guide roller, Guide pins	DA	C	X ndt	C	
B7	Fibre ropes (1) (2)		W	X ndt	C	(1) Include the fibre ropes intended for emergency towing arrangement, cargo handling gear or similar applications. Exclude the fibre ropes specific for offshore units which are covered in items **L15** and **L16** (2) Requirements as per NR216 Note: As per NR467, Pt B, Ch 12, Sec 4 - The towing and mooring arrangement as defined in NR467, Pt B, Ch 12, App 2, [1] and the towing and mooring lines as defined in NR467, Pt B, Ch 12, App 2, [2] are given as a guidance but are not required as a condition of classification. Survey of steel wires and fibre ropes for towing and mooring lines, when requested by the Owner, is to be done as per requirements of NR216, Chapter 10, Section 6
B8	Sea inlets and outlets distance pieces or pad		C/W (1)		C	(1) If nominal diameter ND ≥ 100 mm: material certificate C (class). If nominal diameter ND < 100 mm: material certificate W (works')
B9	Transducer compartment	DA	C	X h	C	
B10	Hawse pipes (1)		C	X	C	(1) Cast piece
B11	Side scuttles and windows	DA	C (1)	X	C	(1) Refer to item **A14** Note 1: Hose test on board Note 2:Also see SOLAS Amendments Ch II-1, Part B-2, Reg 16.: for Hydrostatic tightness test of all Watertight closures such as doors, hatches, sidescuttles, gangway and cargo ports, valves, pipes, ash-chutes, and rubbish-chutes

HULL OUTFITTINGS - ITEM B						
No.	Item	Product certification				Remarks
		Design assessment / Approval	Raw material certificate	Examination and testing	Product certificate	
B12	Shell doors	DA	C	X ndt	C	Note: Hose test on board
B13	Hatch covers (1) (2)					(1) Hose test on board, for watertight covers (2) Also see SOLAS Amendments Ch II-1, Part B-2, Reg 16.: for Hydrostatic tightness test of all Watertight closures such as doors, hatches, sidescuttles, gangway and cargo ports, valves, pipes, ash-chutes, and rubbish-chutes (3) As per NR467, Pt B, Ch 11 Sec 9, [1.3.1] (4) As per NR467, Pt B, Ch 11 Sec 9, [1.3.1] covers for the stoppers and other securing devices, with ref to NR467, Pt B, Ch 4, Sec 1. See NR216 e.g. for forging and casting (refer to NR467, Pt B, Ch 4, Sec 1, [3])
	1- Hatch covers (3)	DA	C	X ndt	C	
	2- Hatch covers for stoppers and securing devices (4)	DA	C	X ndt	C	
B14	Watertight and weathertight doors (1) (2)	DA or TA (1)	C	X h ndt (3) (4)	C	(1) As per NR467, Pt B, Ch 11, Sec 8 (2) Type of tightness (watertight, weathertight, semi-watertight or unprotected) and various degrees of watertightness are defined in NR467, Pt B, Ch 3, Sec 3, [3.3.2] (3) Inspection and testing: hydrostatic pressure testing, leakage criteria for watertight doors, leakage criteria for semi-watertight doors -as per NR467, Pt B, Ch 11, Sec 8, [5] (4) All watertight, semi-watertight and weathertight doors shall be subject to a hose test after installation in a ship. Hose testing on board is to be carried out as per NR467, Pt B, Ch 11, Sec 8, [5] Note 1:Watertight compartments testing on board: also see provisions of NR467, Pt B, Ch 13, Sec 5 (testing procedures of watertight compartments) Note 2:Also see SOLAS Amendments Ch II-1, Part B-2, Reg 16.: for Hydrostatic tightness test of all Watertight closures such as doors, hatches, sidescuttles, gangway and cargo ports, valves, pipes, ash-chutes, and rubbish-chutes
B15	External ramp	DA	C	X ndt (1)	C	(1) Watertightness, as applicable: see item **B14**
B16	Movable deck and inner ramp	DA	C	X ndt	C	

HULL OUTFITTINGS - ITEM B						
No.	Item	Product certification				Remarks
		Design assessment / Approval	Raw material certificate	Examination and testing	Product certificate	
B17	Hydraulic power station for handling items **B11** to **B16**	DA		X	C	(1) For pump housing, material certificates (C / W) according to the piping class. See item **G31** (2) For electrical motors, refer to item **K5**; for the other systems, refer to the relevant provisions of this NR266 and of NR467. For piping, valves and fittings, see items **G26** and **G27** (3) See item **G28** (4) Material certificate C for class 1 pressure vessels; see item **G30** Material certificate W for class 2 or 3 pressure vessels; see item **G30** Note: Other hydraulic power installations: see item **G42**
	1- Pumps (hydraulic pumps)		C / W (1)	X h	C	
	2- Electrical motors (2)	(2)		X	C / W	
	3- Flexible hose assembly (3)	TA	W	X h	C	
	4- Hydraulic jacks, hydraulic cylinders and accumulators	DA	C / W (4)	X h ndt	C	
B18	Fixed parts of lifting appliances (e.g: Crane pedestal, Winch foundations, King posts, Derrick heel seatings, Padeyes) and elements connecting them with the ship structure (1)	DA	C	X ndt	C	(1) See items **O1**, **O2** and **O3**
B19	Ropes, constituent of Shrouds for item **B18** (1)	DA		X (2)	C	(1) See item **O1** for ropes (2) Breaking test on specimen
B20	Loading instrument or calculator / Stability computer (1)	TA or DA (2) (3)		X (2) (3)	C / W (4)	(1) Concerns only ships for which the Rules require a loading calculator (2) Ship specific onboard equipment. Requirements as per NR467, Pt B, Ch 1, Sec 5 and NR467, Pt C, Ch 3, Sec 6. Also see relevant provisions of NR266 item **N** (Automation systems) (3) Loading instrument approval consists of: • approval of hardware according to NR467, Pt C, Ch 3, Sec 6, [2.2], unless two computers are available on board for loading calculations only • approval of basic software according to NR467, Pt C, Ch 3, Sec 6, [2.3] • approval of application software, consisting in data verification which results in the Endorsed Test Condition according to NR467, Part B • installation testing according to NR467, Pt C, Ch 3, Sec 6, [4] (4) As per conditions set in the TA Note: Following installation on board with reference to the approved manual; on board tests as per NR467, Pt C, Ch 3, Sec 6

HULL OUTFITTINGS - ITEM B						
No.	Item	Product certification				Remarks
		Design assessment / Approval	Raw material certificate	Examination and testing	Product certificate	
B21	Articulations and hydraulic cylinders of split hopper dredger and split hopper units	DA		X h	C	(1) For welded construction (2) See item **B17**
	1- Cylinder housing		C	X ndt (1)	C	
	2- Covers		C	X ndt	C	
	3- Piston rods, pins of hinges and eyes		C	X ndt	C	
	4- Main bolting		C	X ndt	C	
	5- Hinge eyes and pins (dock houses and main hinges)		C	X ndt	C	
	6- Hydraulic power station for handling hydraulic cylinders	(2)	(2)	(2)	C	
B22	Emergency towing arrangement (**ETA**)	TA	C	X	C	(1) Buoy and line-throwing appliance may be type approved (2) Certificate W (works'): for the rope only (3) May be type approved
	1- Towing pennant / hook		W		C	
	2- Chafing gear: chain and associated accessories		C		C	
	3- Fairleads		W		C	
	4- Strongpoint (inboard end fastening of the towing gear); main framing, stopping device		C		C	
	5- Pick-up gear: rope, buoy, line-throwing appliance	(1)			W (2)	
	6- Pedestal roller fairlead	(3)	W			
B23	Corrosion protective coatings (epoxy or equivalent): (1) • in dedicated seawater ballast tanks of ships of not less than 500 gross tonnage and double-side skin spaces arranged in bulk carriers of length greater than or equal to 150 m • in void spaces in bulk carriers and oil tankers • in cargo oil tanks of crude oil tankers of 5,000 tonnes deadweight and above.	TA (HBV) (2)	W	X (3)	W	(1) Coating system means the coating product (CP1), which could be an epoxy-based system or an alternative system (ref table 1 of IMO PSPC), and/or the associated shop primer(s) (SP1) (2) Refer to NR467, Pt A, Ch 1, Sec 2. Only for ships assigned with the additional service feature CPS (WBT), or the additional class notation **CPS (WBT), CPS (VSP) or CPS (COT)**: coating system assessment and approval as per procedure described in NR530, Coating Performance Standard (3) The laboratory engaged in testing of coating system is to be recognized

HULL OUTFITTINGS - ITEM B						
No.	Item	Product certification				Remarks
		Design assessment / Approval	Raw material certificate	Examination and testing	Product certificate	
B24	Towing equipment - within the scope of service notations **tug**, **salvage tug**, **escort tug** (1) Anchor handling equipment - within the scope of service notation **anchor handling** (2)	DA (3)		X ndt (4) (5)	C	(1) Including towing hook, towing winch, hook quick-release device, winch quick-release device, winch slip device - within the scope of service notations **tug**, **salvage tug**, **escort tug** (see NR467, Part E, Chapter 1) (2) Intended for towing vessels and/or supply vessels equipped with winches for anchor handling operations - within the scope of service notation **anchor handling** (see NR467, Part E, Chapter 1) (3) Or assessment by the mean of type tests according to special conditions (4) Tugs, Salvage tugs, Escort tugs: testing as per agreed program; refer to the relevant provisions of NR467, Part E, Chapter 1 (5) Anchor handling vessels: testing as per agreed program; refer to the relevant provisions of NR467, Part E, Chapter 2 (6) See item **G26** (Piping) and **G42** (Hydraulic systems) (7) For electric systems (motors, switchboards, starter cabinets, alarm panels, etc.), refer to the relevant provisions of item **K**; for the other systems, refer to the relevant provisions of this NR266 and of NR467 Note: On board tests as per agreed program; refer to the relevant provisions of NR467, Part E, Chapter 1 and NR467, Part E, Chapter 2
	1- Hook		W	X ndt	C	
	2- Main shaft		C	X ndt	C	
	3- Casing or body, winch drum / gipsy-wheel if any, and main load-bearing structures		C	X ndt	C	
	4- Hydraulic systems, Electric systems (6) (7)	DA		X h	C	
	5- Stern roller, Wire stopper, Guide pins	DA	C	X ndt (4)	C	
B25	Bollards and bitts (1)					(1) As per provisions of NR467, Pt B, Ch 12, Sec 4, [4].
	1- As per recognised standards		W		W	
	2- Other cases	DA	C	X	C	
B26	Bolts, Nuts and Studs	DA	C (1)	X ndt (1)	C	(1) Material tests (mechanical properties and chemical composition) and NDT - as per NR216, Chapter 5

Item C - Fire Protection, Detection and Extinction Systems

FIRE PROTECTION, DETECTION AND EXTINCTION SYSTEMS - ITEM C						
No.	Item	Product certification				Remarks
		Design assessment / Approval	Raw material certificate	Examination and testing	Product certificate	
C1	Fire-resisting and fire-retarding divisions and associated doors: Class A, B, H					(1) In the case of a discrepancy between the provisions of the applicable International and National statutory regulations and those of the Society's Rules, normally the former take precedence. A valid certification to MED 2014/90/EU (or MED96/98/EC as amended for its Annex A1 items) is to be recognised for classification purpose (2) As per survey scheme set in the TA
	- fire-resisting and fire-retarding divisions (bulkheads or decks)	TA (1)		X	C / W (2)	
	- associated doors	TA (1)			C / W (2)	
C2	Upholstered furniture, excluding the frame	TA (HBV) (1)			W	(1) See item **C1**, remark (1)
C3	Materials for pipes penetrating A or B class divisions (where they are not of steel or other equivalent material)	TA (HBV) (1)			W	(1) See item **C1**, remark (1)
C4	Materials other than steel for pipes conveying oil or fuel oil: pipes and fittings, valves, flexible pipe assemblies	TA (HBV) (1)			W	(1) See item **C1**, remark (1)
C5	Materials for electrical cables penetrations through A or B class divisions	TA (HBV) (1)			W	(1) See item **C1**, remark (1)
C6	Materials with low flame spread characteristic including paints, varnishes and similar, when they are required to have such characteristic	TA (HBV) (1)			W	(1) See item **C1**, remark (1)
C7	Non-combustible materials	TA (HBV) (1)			W	(1) See item **C1**, remark (1)
C8	Vertically supported textiles	TA (HBV) (1)			W	(1) See item **C1**, remark (1)
C9	Primary deck coverings	TA (HBV) (1)			W	(1) See item **C1**, remark (1)
C10	Fixed foam fire-extinguishing systems and associated foam-forming liquids (1)	TA (2)		X h ndt	C / W (3)	(1) Gas bottles and distribution systems: see item **C36** (2) See item **C1**, remark (1) (3) As per conditions set in the TA

FIRE PROTECTION, DETECTION AND EXTINCTION SYSTEMS - ITEM C						
No.	Item	Product certification				Remarks
		Design assessment / Approval	Raw material certificate	Examination and testing	Product certificate	
C11	Fixed powder fire-extinguishing systems, including powder (1)	TA (2)		X h ndt	C / W (3)	(1) Gas bottles and distribution systems: see item **C36** (2) See item **C1**, remark (1) (3) As per conditions set in the TA
C12	Flexible pipes and expansion bellows of non-conventional material for any type of fluid	TA (1)	W	X h ndt	C / W (2)	(1) See also items **G28** and **G38** (2) As per conditions set in the TA
C13	Sprinkler heads for automatic sprinkler systems	TA (HBV) (1)			W	(1) See item **C1**, remark (1)
C14	Nozzles for fixed pressure water-spraying fire-extinguishing systems for machinery spaces, boiler rooms and spaces intended for the carriage of vehicles	TA (HBV) (1)			W	(1) See item **C1**, remark (1)
C15	Sensing heads for automatic fire alarm and fire detection systems	TA (HBV) (1)			W	(1) See item **C1**, remark (1)
C16	Fixed fire detection and fire alarm systems (1)	TA (2)		X	C / W (3)	(1) See item **N4** (2) See item **C1**, remark (1) (3) As per conditions set in the TA
C17	Explosive mixture detecting systems (1)	TA (HBV) (2)			W	(1) See item **N4** (2) See item **C1**, remark (1)
C18	Portable explosive mixture detecting apparatus	TA (HBV) (1)			W	(1) See item **C1**, remark (1)
C19	Fixed instruments for measuring the oxygen content for inert gas systems serving cargo tanks	TA (HBV) (1)			W	(1) See item **C1**, remark (1)
C20	Portable instruments for measuring the oxygen content for inert gas systems serving cargo tanks	TA (HBV) (1)			W	(1) See item **C1**, remark (1)
C21	Fire dampers	TA (1)		X ndt	C / W (2)	(1) See item **C1**, remark (1) (2) As per conditions set in the TA
C22	Bedding components	TA (HBV) (1)			W	(1) See item **C1**, remark (1)

FIRE PROTECTION, DETECTION AND EXTINCTION SYSTEMS - ITEM C						
No.	Item	Product certification				Remarks
		Design assessment / Approval	Raw material certificate	Examination and testing	Product certificate	
C23	Equivalent water-mist fire-extinguishing systems (1)	TA (2)		X	C / W (3)	(1) Gas bottles and distribution systems: see item **C36** (2) See item **C1**, remark (1) (3) As per conditions set in the TA
C24	Equivalent fixed gas fire-extinguishing systems (1)	TA (2)		X	C / W (3)	(1) Gas bottles and distribution systems: see item **C36** (2) See item **C1**, remark (1) (3) As per conditions set in the TA
C25	Fixed local application fire-extinguishing systems (1)	TA (2)		X	C / W (3)	(1) Gas bottles and distribution systems: see item **C36** (2) See item **C1**, remark (1) (3) As per conditions set in the TA
C26	Equivalent water-mist automatic sprinkler systems (1)	TA (2)		X	C / W (3)	(1) Gas bottles and distribution systems: see item **C36** (2) See item **C1**, remark (1) (3) As per conditions set in the TA
C27	Fire extinguishers	TA (1)		X	C / W (2)	(1) See item **C1**, remark (1) (2) As per conditions set in the TA
C28	Surface linings (of bulkheads and ceilings) (1)	TA (HBV) (2)			W	(1) See item **C6** (2) See item **C1**, remark (1)
C29	Floor coverings (1)	TA (HBV) (2)			W	(1) See item **C6** (2) See item **C1**, remark (1)
C30	Fire windows	TA (HBV) (1)			W	(1) See item **C1**, remark (1)
C31	Prefabricated fire resisting elements (sanitary blocks for example)	TA (1)		X	C / W (2)	(1) See item **C1**, remark (1) (2) As per conditions set in the TA
C32	Fire pumps and their prime movers	DA		X (1)	C	(1) Performance test for bilge and fire pumps according to NR467, Pt C, Ch 1, Sec 10. See item **G31** (2) For electrical motors, refer to item **K**; for other systems, refer to relevant provisions of this NR266 and of NR467 Diesel engines as per item **E1**
	1- Fire pumps		W	X h ndt	C	
	2- Prime movers	(2)	(2)	X (2)	C / W (2)	
C33	Fire hydrants, pipes, shore connections, valves and accessories	(1)	(1)	(1)	(1)	(1) Requirements according to relevant class of piping; see items **G26** and **G27**

FIRE PROTECTION, DETECTION AND EXTINCTION SYSTEMS - ITEM C						
No.	Item	Product certification				Remarks
		Design assessment / Approval	Raw material certificate	Examination and testing	Product certificate	
C34	Fire hoses	TA (HBV) (1)			W	(1) See item **C1**, remark (1)
C35	Dual-purpose nozzles	TA (HBV) (1)			W	(1) See item **C1**, remark (1)
C36	High pressure CO_2 fire smothering systems (1)	DA			C	(1) Specific requirements are given in NR467, Pt C, Ch 4, Sec 15, [4.1.3] (2) Vessels: see item **G30** (3) Piping: as per relevant provisions of items **G26**, **G27** and **G28**
	1- Gas bottles (2)	DA / TA	C / W	X h ndt	C	
	2- Distribution systems (3)	DA /TA	C / W	X h ndt	C / W	
C37	Low pressure CO_2 fire smothering storage systems (1) (2) (3)	DA / TA	C / W	X h ndt	C	(1) Except where different requirements are given in this item, the requirements of item **C36** for systems with carbon dioxide contained in high pressure bottles are generally to be complied with. (2) Specific requirements are given in NR467, Pt C, Ch 4, Sec 15 [4.1.4] (3) Gas bottles and distribution systems: see item **C36**
C38	Foam proportioner / inductor	TA	C / W (1)	X h ndt (2)	C / W (1)	(1) See item **G26** (2) If of welded construction.
C39	Water / foam monitor	TA		X	C / W (1)	(1) As per conditions set in the TA
C40	Foam applicator	TA HBV		X	W	

Item D - Cargo Environmental Control, IG (Inert Gas) Systems

CARGO ENVIRONMENTAL CONTROL, IG (INERT GAS) SYSTEMS - ITEM D						
No.	Item	Product certification				Remarks
		Design assessment / Approval	Raw material certificate	Examination and testing	Product certificate	
D1	Inert gas generator system: boiler flue gas or oil fired inert gas generators (1)	DA	C	X h ndt	C	(1) See item **G15**
D2	Burning units for item **D1** (1)	DA	(1)	X	C	(1) See item **G16** (and item **F16**)
D3	Uptake valves of main boilers (1)	DA	C / W (1)	X h	C	(1) Considered as class 1 piping accessory: see item **G27**
D4	Expansion bellows (1)	TA	W	X h ndt	C	(1) See item **G38**
D5	Inert gas scrubber	DA	C	X h ndt (1)	C	(1) See item **G30** for pressure vessels
D6	Blowers	DA		X	C	
D7	Deck water seal	DA		X h	C	
D8	Non return devices supplementing the deck water seal	DA		X	C	
D9	Discharge pipe from scrubber to overboard		C	X h	C	
D10	Isolating valves from IG system and cargo tanks (1)	TA or DA	C / W (1)	X h ndt	C	(1) See item **H17** or **I14** according to the case
D11	Regulating valves	DA	(1)	X h	C	(1) See item **G27** for accessories of pipes (valves and fittings)
D12	Control and monitoring systems and components (gauge, sensors, oxygen analyser, etc…) (1)	TA		X	C / W (2)	(1) See item **N5** (2) As per survey scheme set in the TA
D13	Breathing valves or devices	TA		X (1)	C	(1) Setting verification

CARGO ENVIRONMENTAL CONTROL, IG (INERT GAS) SYSTEMS - ITEM D						
No.	Item	Product certification				Remarks
		Design assessment / Approval	Raw material certificate	Examination and testing	Product certificate	
D14	Inert gas coolers	DA	(1)	X h	C	(1) See item **G30** for pressure vessels
D15	Other IG Systems / Nitrogen generator system or N2 gas generator system where inert gas is produced by separation of the air into its component gases: i.e. compressed air processed through a bundle of hollow fibres, semi-permeable membranes or adsorber materials (1)	DA	C	X h ndt	C	(1) The requirements for inert gas systems given in item **D1**, applicable to vessels, piping arrangements, alarms and instrumentation downstream of the generator, etc., are to be complied with, as far as applicable
D16	Feed air compressors for item **D15** and their prime movers	DA				(1) Together with dryers if any (2) For electrical motors, refer to item **K**; for other systems, refer to relevant provisions of this NR266 and of NR467 (3) As per provisions of Rules NR467
	1- Feed air compressors	DA	W	X h (1)	C	
	2- Prime movers (2)	(2)	(2)	X (2)	C / W	
	3- P/V Breakers and dryers (2)	DA or TA (3)		X h (1)	C	
D17	Air receivers and process tanks for item **D15** (1)	DA	C	X h ndt (2)	C	(1) See item **G30** for pressure vessels (2) Including calibration of safety devices
D18	Synthesis gas modules for item **D15** (1)	DA		X	W	(1) For special types of process, the Society reserves the right to add requirements or modify those given in item **D18**
D19	Feed air treatment system for item **D15** (1)	DA	W	X h ndt	C	(1) See item **G30** for pressure vessels

Item E - Main Diesel Engines and their Auxiliaries

MAIN DIESEL ENGINES AND THEIR AUXILIARIES - ITEM E						
No.	Item	Product certification				Remarks
		Design assessment / Approval	Raw material certificate	Examination and testing	Product certificate	
E1	Diesel engines listed bellow: • Main propulsion engines • Engines driving electric generators, including emergency generators • Engines driving other auxiliaries essential for safety and navigation and cargo pumps in tankers, when they develop a power P ≥ 110 kW General remarks: (1) (2) (3) (4) (5) (6) (7) (8) (9)	TA (10)		X ndt (11) (12)	C	(1) Symbols specifically used in this item **E1** are defined below, in accordance with NR467, Pt C, Ch 1, Sec 2: Chem : Chemical composition CD : Crack detection by MPI (magnetic particle inspection) or DP (dye penetration inspection) D : Cylinder bore diameter (mm) GJL : Grey cast iron GJS : Spheroidal graphite cast iron GS : Cast steel Mech : Mechanical properties C : Society certificate TR : Test report UT : Ultrasonic testing W : Work certificate X : Visual examination of accessible surfaces by the Surveyor (2) For turbochargers: see item **E12** and provisions of NR467, Pt C, Ch 1, Sec 16 (3) Crankcase explosion relief valves are to be type tested in accordance with NR467, Pt C, Ch 1, App 4 and documented according to NR467, Pt C, Ch 1, Sec 2, [2.3.4]. Also see item **E9** (4) Oil mist detection systems are to be type tested in accordance with NR467, Pt C, Ch 3, App 1 and documented according to NR467, Pt C, Ch 1, Sec 2, [2.3.5]. Also see item **E9** (5) For speed governor and overspeed protective devices, see NR467, Pt C, Ch 1, Sec 2, [2.7]. Also see item **E9** (6) All the other engines are to be designed and constructed according to sound marine practice, with the equipment required in NR467, Pt C, Ch 1, Sec 2, [2.3.4], and delivered with the relevant works' certificate (see NR216, Ch 1, Sec 1, [4.2.3]) (7) Engines intended for propulsion of lifeboats and compression ignition engines intended for propulsion of rescue boats are to comply with the relevant rule requirements
	1- Welded bedplate		W (Chem+Mech) (13)	W(UT+CD) (14) fit-up + post-welding (15)	C	
	2- Bearing transverse girders GS		W (Chem+Mech) (13)	W(UT+CD) (14) X	C	
	3- Welded frame box		W (Chem+Mech) (13)	W(UT+CD) (14) fit-up + post-welding (15)	C	
	4- Cylinder block GJL (applicable to crosshead engines)			W (16) (17)		
	5- Cylinder block GJS (applicable to crosshead engines)			W (16) (17)		
	6- Welded cylinder frames (applicable to crosshead engines)		W (Chem+Mech) (13)	W(UT+CD) (14) fit-up + post-welding (15)	C	

MAIN DIESEL ENGINES AND THEIR AUXILIARIES - ITEM E						
No.	Item	Product certification				Remarks
		Design assessment / Approval	Raw material certificate	Examination and testing	Product certificate	
E1	7- Engine block GJL (applicable to engines > 400 kW/Cyl.)			W (16) (17)		(8) Additional requirements for control and safety systems for dual fuel engines are given in NR467, Pt C, Ch 1, App 2 (9) In addition to the requirements of NR467, Pt C, Ch 1, Sec 2, those given in NR467, Pt C, Ch 1, Sec 1 apply (10) Type test: as per NR467, Pt C, Ch 1, Sec 2 (11) NDT as per NR467, Pt C, Ch 1, Sec 2 (12) Works trials (factory acceptance tests), as per NR467, Pt C, Ch 1, Sec 2 (13) Material properties include chemical composition and mechanical properties, and also surface treatment such as surface hardening (hardness, depth and extent), peening and rolling (extent and applied force) (14) Non-destructive examination means e.g. ultrasonic testing, crack detection by MPI or DP. (15) Visual inspection by the Surveyor (16) Hydraulic testing to be applied on the water/oil side of the component. Items are to be tested by hydraulic pressure at the pressure equal to 1,5 times the maximum working pressure. High pressure parts of the fuel injection system are to be tested by hydraulic pressure at the pressure equal to either 1,5 times the maximum working pressure or the maximum working pressure plus 300 bar, whichever is lesser. Where design or testing features may require modification of these test requirements, special consideration may be given (17) Hydraulic testing is also required for those parts filled with cooling water and having the function of containing the water which is in contact with the cylinder or the cylinder liner (18) Dimensional inspection, including surface condition
	8- Engine block GJS (applicable to engines > 400 kW/Cyl.)		W (Mech) (13)	W (16) (17)		
	9- Cylinder liner (applicable to engines with D > 300 mm)		W (Chem+Mech) (13)	W (16) (17)		
	10- Cylinder head GJL (applicable to engines with D > 300 mm)			W (16)		
	11- Cylinder head GJS (applicable to engines with D > 300 mm)			W (16)		
	12- Cylinder head GS (applicable to engines with D > 300 mm)		W (Chem+Mech) (13)	W(UT+CD) (14) W (16) X	C	
	13- Forged cylinder head (applicable to engines with D > 300 mm)		W (Chem+Mech) (13)	W(UT+CD) (14) W (16) X	C	
	14- Piston crown GS (applicable to engines with D > 400 mm)		W (Chem+Mech) (13)	W(UT+CD) (14) X	C	
	15- Forged piston crown (applicable to engines with D > 400 mm)		W (Chem+Mech) (13)	W(UT+CD) (14) X	C	
	16- Crankshaft: made in one piece		C (Chem+Mech) (13)	W(UT+CD) (14) W (18), Random of fillets and oil bores (15)	C	

MAIN DIESEL ENGINES AND THEIR AUXILIARIES - ITEM E						
No.	Item	Product certification				Remarks
		Design assessment / Approval	Raw material certificate	Examination and testing	Product certificate	
E1	17- Semi-built crankshaft (Crank throw, forged main journal and journals with flange)		C (Chem+Mech) (13)	W(UT+CD) (14) W (18), Random of fillets and shrink fittings (15)	C	
	18- Exhaust gas valve cage (applicable to crosshead engines)			W (7-16)		
	19- Piston rod, if applicable (applicable to engines with D > 400 mm)		C (Chem+Mech) (13)	W(UT+CD) (14) CD again after final machining (grinding), Random (13)	C	
	20- Crosshead (applicable to crosshead engines)		C (Chem+Mech) (13)	W(UT+CD) (14) CD again after final machining (grinding), Random (15)	C	
	21- Connecting rod with cap		C (Chem+Mech) (13)	W(UT+CD) (14) W (18), Random of all surfaces, in particular those shot peened (15)	C	

MAIN DIESEL ENGINES AND THEIR AUXILIARIES - ITEM E						
No.	Item	Product certification				Remarks
		Design assessment / Approval	Raw material certificate	Examination and testing	Product certificate	
E1	22- Coupling bolts for crankshaft		C (Chem+Mech) (13)	W(UT+CD) (14) W (18), Random of interference fit (15)	C	(19) Material certification requirements for pumps and piping components are dependent on the operating pressure and temperature. Requirements given in this Item apply unless alternative requirements are given in NR467, Pt C, Ch 1, Sec 10, Tab 40. (20) Applicable to engines with D > 300 mm (21) Applicable to engines with D ≤ 300 mm (22) Material certification requirements for pumps and piping components are dependent on the operating pressure and temperature. Requirements given in this Table apply unless alternative requirements are given in NR467, Ch 1, Sec 10, Tab 40.
	23- Bolts and studs for main bearings (applicable to engines with D > 300 mm)		W (Chem+Mech) (13)	W(UT+CD) (14)		
	24- Bolts and studs for cylinder heads (applicable to engines with D > 300 mm)		W (Chem+Mech) (13)	W(UT+CD) (14)		
	25- Bolts and studs for connecting rods (applicable to engines with D > 300 mm)		W (Chem+Mech) (13)	W(UT+CD) (14), TR of thread making (18)		
	26- Tie rod (applicable to crosshead engines)		W (Chem+Mech) (13)	W(UT+CD) (14), TR of thread making (18), Random (15)	C	
	27- High pressure fuel injection pump body (19)			W (16) (20) TR (16) (21)	W (22)	
	28- High pressure fuel injection valves (only for those not autofretted) (19)			W (16) (20) TR (16) (21)	W (22)	
	29- High pressure fuel injection pipes including common fuel rail (19)		W (Chem+Mech) (13)	W (16) (20) TR (16) (21)	W (22)	
	30- High pressure common servo oil system (19)		W (Chem+Mech) (13)	W (16) (20) TR (16) (21)	W (22)	

MAIN DIESEL ENGINES AND THEIR AUXILIARIES - ITEM E						
No.	Item	Product certification				Remarks
		Design assessment / Approval	Raw material certificate	Examination and testing	Product certificate	
E1	31- Cooler (Charge air cooler), both sides (23) (applicable to engines with D > 300 mm) (19) (24) (25)		W (Chem+Mech) (13)	W (16) (24)	W (22)	(23) Charge air cooler (24) Charge air coolers need only be tested on the water side (25) Material and component certifications are to follow the requirements given in NR467, Pt C, Ch 1, Sec 3 for pressure vessels. Depending on their class, a design assessment may be required. (26) Applicable to all engines with accumulators with a capacity of > 0,5 l
	32- Accumulator (19) (25) of common rail fuel or servo oil system		W (Chem+Mech) (13) (26)	W (16) (26)	W (22)	
	33- Piping, pumps, actuators, etc. for hydraulic drive of valves, if applicable (applicable to engines > 800 kW/Cyl.) (19)		W (Chem+Mech) (13)	W (16)		
	34- Engine driven pumps (oil, water, fuel, bilge) other than pumps referred to item 27 to 33 (applicable to engines > 800 kW/Cyl.) (19)			W (16)		
	35- Bearings for main, crosshead, and crankpin (applicable to engines > 800 kW/Cyl.)		TR(C) (13), TR(UT for full contact between basic material and bearing metal) (14)	W (18)		
E2	Cooling pumps, lubricating oil pumps, independent of item **E1**, and their prime movers					(1) Pump housing: material certificate (C / W) according to the piping class. See item **G31** (2) Non electrical (i.e. hydraulic); for electrical motors, refer to item **K5**
	1- Cooling pumps, lubricating oil pumps, independent of **E1**		C / W (1)	X h	C	
	2- Prime movers (2)			X h	C	
E3	Heat exchangers (lubricating oil or fresh water coolers, fuel heaters)	DA or TA	C / W (1)	X h ndt	C	(1) Material certificate (C / W) according to the vessel class 1, 2 or 3. See item **G30** (Pressure vessels)
E4	Exhaust gas-boilers (1)	DA	C	X h ndt	C	(1) See item **G15**

MAIN DIESEL ENGINES AND THEIR AUXILIARIES - ITEM E						
No.	Item	Product certification				Remarks
		Design assessment / Approval	Raw material certificate	Examination and testing	Product certificate	
E5	Starting air receivers of item **E1** (1)	DA or TA (2)	C	X h ndt (3)	C	(1) See item **G30** for pressure vessels (2) Air Starters are part of Starting equipment of diesel engines. Equipment for primary 'essential services' as per NR467 Pt C, Ch 2, Sec 1. Product certificate required for Air Starters: C/W, as per conditions set in the TA (IBV/HBV) (3) Including setting of safety devices, if any Note: During sea trials of the ship (capacity check)
E6	Air compressors for filling of item **E5**, and their prime movers	DA (1)				(1) Compressed air systems: ref NR467, Pt C, Ch 1, Sec 10, [17]. Air compressors having a crankcase volume of at least 0,6 m3 are to be fitted with crankcases explosion relief valves satisfying the provisions of NR467, Pt C, Ch 1, Sec 2, [2.3.4]. Also see item **E9** (2) Including coolers, if any (3) Non electrical (i.e. hydraulic); for electrical motors, refer to item **K5** Note: Under load, on board (capacity). Also refer to NR467, Ch 1, Sec 17 (Shipboard tests for machinery)
	1- Air compressors for filling of item **E5**		W	X h (2)	C	
	2- Prime movers (3)			X h	C	
E7	Turning gears of item **E1**			X	W	Note: Running test - on board
E8	Scavenging and supercharging compressors or blowers (1)	DA or TA	C / W	X h ndt	C / W	(1) For turbochargers, refer to provisions of item **E12** (2) As per NR467. 'Scavenging air auxiliary compressors or blowers' are considered as equipment for primary 'essential services' (services which need to be maintained in continuous operation) (3) As general, electrically-driven auxiliary blowers are provided to supplement the scavenge air delivery when engines are operating at low loads and speeds (because, at such low engine loads and speeds, the turbochargers cannot deliver the necessary air for the gas flow process) (4) TA as per NR467, Pt C, Ch 1, Sec 16. Type tests as per agreed program (5) Shaft and rotor including blades: material certificate C, for auxiliary compressors or blowers fitted on diesel engines with cylinder bore D > 300 mm. Works' certificate W may be accepted for auxiliary compressors or blowers fitted on diesel engines with cylinder bore D ≤ 300 mm (6) Examination, testing and certification: as per relevant provisions of item **E12** (turbochargers) (7) Electrical motors: refer to relevant provisions of item **K5**
	1- Auxiliary compressors or blowers (2) (3)	DA or TA (4)	C (5)	X h ndt (6)	C / W (6)	
	2- Electrical motors (7)	DA or TA	W (7)	X (7)	C / W (7)	

MAIN DIESEL ENGINES AND THEIR AUXILIARIES - ITEM E						
No.	Item	Product certification				Remarks
		Design assessment / Approval	Raw material certificate	Examination and testing	Product certificate	
E9	Crankcase explosion relief valves, Oil mist detection, Regulation and safety devices (1) (2)					(1) Speed governor and overspeed protective devices: see NR467, Pt C, Ch 1, Sec 2, [2.7]. (2) Also see relevant provisions of items, **K25**, **N**, **G26**, and **G27** (3) Diesel engines of a cylinder diameter of 200 mm and above or a crankcase gross volume of 0,6 m^3 and above are to be provided with crankcase explosion relief valves in accordance with Rules. Crankcase construction and crankcase doors are to be of sufficient strength to withstand anticipated crankcase pressures that may arise during a crankcase explosion taking into account the installation of explosion relief valves required by NR467, Pt C, Ch 1, Sec 2. Type testing procedure is to comply with NR467, Pt C, Ch 1, App 4. (4) Oil mist detection arrangements are to be of a type approved and tested in accordance with NR467, Pt C, Ch 3, App 1 and comply with relevant provisions of NR467, Pt C, Ch 1, Sec 2. Engine bearing temperature monitors or equivalent devices used as safety devices have to be of a type approved by the Society for such purposes. (5) Testing and/or document review, as applicable (6) Testing as per NR467 and program accepted by the Society (7) As per technology and conditions set in the TA Note: During running, load tests, according to agreed program
	1- Crankcase explosion relief valves	TA (3) (4)	C (5)	X (6)	C (7)	
	2 - Oil mist detection, Regulation and safety devices	TA (3) (4) HBV		X (6)	W (7)	
E10	Pressure pipes (water, lubricating oil, fuel oil, and compressed air pipes), valves and other fittings	(1)	C / W (1)	X h	C	(1) See items **G26** and **G27**
E11	Mass-produced diesel engines (1)	TA (1)	(1)	X ndt (1)	C (1)	(1) This item **E11** is kept for information and records only; the terminologies “Mass-produced diesel engines” or “Mass production” are no longer used in NR467 (such consideration has been withdrawn since July 2016). For diesel engines, refer to item **E1** and provisions of NR467, Pt C, Ch 1, Sec 2

MAIN DIESEL ENGINES AND THEIR AUXILIARIES - ITEM E						
No.	Item	Product certification				Remarks
		Design assessment / Approval	Raw material certificate	Examination and testing	Product certificate	
E12	Turbochargers (1) (2) (3)	TA				(1) Turbochargers are to be type approved, either separately or as a part of an engine. The requirements are written for exhaust gas driven turbochargers, but apply also, in principle, to engine driven chargers (2) The requirements escalate with the size of the turbochargers. The size parameter is the engine power (at MCR) supplied by a group of cylinders served by the actual turbocharger (e.g. for a V-engine with one turbocharger for each bank, the size is half of the total engine power) (3) Scavenging/auxiliary compressors or blowers: refer to item **E8** (4) Categories B and C turbochargers: documentation for approval and type tests as per NR467, Pt C, Ch 1, Sec 16 (5) Chemical composition of material for the rotating parts; mechanical properties of the material of a representative specimen for the rotating parts and the casing (6) Works' inspection and testing as per NR467, Pt C, Ch 1, Sec 16 (7) UT and crack detection of rotating parts: Works' certificate (W); dimensional inspection of rotating parts: Works' certificate (W) (8) Rotor balancing: Class certificate (C) for category C turbochargers, Works' certificate (W) for category B turbochargers (9) Hydraulic testing of cooling spaces to 4 bars or 1,5 times the maximum working pressure, whichever is higher: Class certificate (C) for category C turbochargers, Works' certificate (W) for category B turbochargers (10) Overspeed test of all the compressor wheels for a duration of 3 minutes at either 20% above the alarm level speed at room temperature or 10% above the alarm level speed at 45°C inlet temperature when tested in the actual housing with the corresponding pressure ratio. The overspeed test may be waived for forged wheels that are individually controlled by an approved non-destructive method: Class certificate (C) for category C turbochargers, Works' certificate (W) for category B turbochargers (11) Category A turbochargers: documentation for approval as per NR467, Pt C, Ch 1, Sec 16, Table 1. (12) According to an agreed program
	1- Category C: Turbochargers having served power by cylinder groups > 2500 kW	TA (4)	W (5)	X h ndt (6) (7) (8) (9) (10)	C	
	2- Category B: Turbochargers having served power by cylinder groups > 1000 kW and ≤ 2500 kW	TA (4) HBV	W (5)	X h ndt (6) (7) (8) (9) (10)	W	
	3- Category A: Turbochargers having served power by cylinder groups ≤ 1000 kW	TA (11) HBV	W	X h ndt (12)	W	

MAIN DIESEL ENGINES AND THEIR AUXILIARIES - ITEM E						
No.	Item	Product certification				Remarks
		Design assessment / Approval	Raw material certificate	Examination and testing	Product certificate	
E13	Gas engines (1) (2) For ships with gas fuelled propulsion; the service notation is completed by one of the following additional service features: • dualfuel for engines using both gas and fuel oil as fuel • gasfuel for engines using only gas as fuel	TA (3) (4)	C / W (3) (4) (5)	X (3) (4) (5)	C	(1) The gas may be either compressed natural gas or liquefied natural gas (2) Refer to specific requirements of NR529 Gas Fuelled Ships, and relevant provisions of NR467, Pt D, Ch 9, Sec 16 (3) The provisions of item **E1** (Main and auxiliary diesel engines) regarding survey of engine components and evaluation of test results are to be complied with, as far as applicable (4) See also relevant provisions of NR467, Part C, Chapter 1, particularly NR467, Pt C, Ch 1, App 2 (5) For piping systems: see also the relevant provisions of NR216 and NR467, Pt C, Ch 1, Sec 10
E14	Chocking systems, chocking resins	TA (1)	W	X	C / W (2)	(1) As per NR467, NR467, Pt C, Ch 1, Sec 1 (2) As per conditions set in the TA

MAIN TURBINES, MAIN BOILERS, AND THEIR AUXILIARIES - ITEM F						
No.	Item	Product certification				Remarks
		Design assessment / Approval	Raw material certificate	Examination and testing	Product certificate	
F1	Steam turbines (1) (all steam turbines, including propulsion steam turbines, steam turbines intended for auxiliary services essential for safety and navigation, or for driving cargo pumps in tankers)	DA		X (2)	C	(1) For mass-produced turbines which are requested to be type approved by the Society, the tests and trials on a prototype are to be carried out in the presence of the Surveyor. The minimum required attendance of the Surveyor at the production tests and trials will be agreed between the manufacturer and the Society on a case-by-case basis (2) Type tests, material tests, workshop inspection and testing, certification - as per NR467, Pt C, Ch 1, Sec 4 (3) Material tests (all) and NDT: magnetic particle or liquid penetrant (all) and Ultrasonic or X Ray examination (sample) (4) Thermal stability test of rotors (solid forged and welded rotors of propulsion turbines are to be subjected to a thermal stability test where the service temperature exceeds 400°C; this test is to be carried out after heat treatment and rough machining or at a later stage of fabrication, in accordance with a procedure agreed by the Society) (5) Balancing and overspeed test of rotors (6) Material tests (all) and NDT: magnetic particle or liquid penetrant (spot as agreed between the Manufacturer and the Surveyor) (7) Material tests (sample) and NDT: magnetic particle or liquid penetrant (sample) and Ultrasonic or X Ray examination (sample) (8) See items **G26** and **G27** (9) Material tests and NDT: as required in the relevant Sections of the Rules (10) Including overspeed tripping device test (11) See item **G1** (12) Such as pressure gauges, thermometers, speed indicators, vibration detectors. Automation systems: see relevant provisions of item **N** (13) Accuracy (calibration) to be checked (14) See item **G30** for pressure vessels
	1- Rotating parts (turbine rotors, shafts, stiff and flexible couplings, bolts for couplings and other dynamically stressed parts, integral pinions and gears)		C (3)	X ndt (4) (5)	C	
	2- Stationary parts (castings and plates for casings)		W (6)	X h ndt	C	
	3- Blades		C (7)	X ndt	C	
	4- Piping, valves and associated fittings	(8)	C / W (8) (9)	X h ndt	C	
	5- Regulation and safety devices			X (10)	C	
	6- Flexible coupling (11)	DA	C / W	X	C / W	
	7- Measuring instruments (12)	TA		X (13)	C	
	8- Turbine and nozzle casings		W (6)	X h ndt	C	
	9- Intermediate coolers and heat exchangers (14)	DA	C	X h ndt	C	
F2	Manoeuvring and distribution valves of item **F1**	DA	C (1)	X	C	(1) For casing only

MAIN TURBINES, MAIN BOILERS, AND THEIR AUXILIARIES - ITEM F						
No.	Item	Product certification				Remarks
		Design assessment / Approval	Raw material certificate	Examination and testing	Product certificate	
F3	Main condensers	DA		X h	C	(1) Including chemical analysis (2) Hydraulic test, or examination as per agreed procedure Note: Running tests - during sea trials
	1- Tubes		C (1)	X h (2)		
	2- Tubes plates		C	X		
	3- Water boxes and shells			X		
F4	Turning gears of item **F1**			X	W	Note: Running tests - on board
F5	Circulating pumps and their prime movers			X	C	(1) Pump housing: material certificates (C / W) according to the piping class. See item **G31** (2) Non electrical (i.e. hydraulic); for electrical motors, refer to item **K5**
	1- Circulating pumps		C / W (1)	X h	C	
	2- Prime movers (2)			X h	C	
F6	Lubricating oil pumps and their prime movers (1)			X	C	(1) See item **E2** (2) Pump housing: material certificates (C / W) according to the piping class. See item **G31** (3) Non electrical (i.e. hydraulic); for electrical motors, refer to item **K5**
	1- Lubricating oil pumps		C / W (2)	X h	C	
	2- Prime movers (3)			X h	C	
F7	Extraction pumps and their prime movers (1)			X	C	(1) See item **F5** (2) Pump housing: material certificates (C / W) according to the piping class. See item **G31** (3) Non electrical (i.e. hydraulic); for electrical motors, refer to item **K5**
	1- Extraction pumps		C / W (2)	X h	C	
	2- Prime movers (3)			X h	C	
F8	Air ejectors (1)			X h	C	(1) Or vacuum pumps and their non electrical prime movers Note: Running tests - on board, general examination
F9	Lubricating oil coolers (1)	DA	C (2)	X h	C	(1) See item **E3** (2) For tubes and plates: chemical analysis supplied by the manufacturer
F10	Drain coolers (1)	DA	C (2)	X h	C	(1) And steam traps - see item **G30** for pressure vessels (2) Casing only (material certificate W, if vessel class 2 or 3)

MAIN TURBINES, MAIN BOILERS, AND THEIR AUXILIARIES - ITEM F						
No.	Item	Product certification				Remarks
		Design assessment / Approval	Raw material certificate	Examination and testing	Product certificate	
	Main boilers (1) and their accessories (2)	DA		X h	C	(1) See item **G30** for pressure vessels (2) Automation systems: see relevant provisions of item **N** (3) If forming or welding (4) For cylindrical boilers only (internal test) (5) For tubes and headers of steam heaters only (6) And accessories, see item **G27** (7) See item **G27** (8) Capacity test on prototype (9) Setting and accumulation tests (10) See items **G26** and **G27** (11) For pressure pipes (12) As per conditions set in TA (13) Accuracy to be checked Note: Running tests - on board under load, during sea trials
	1- Drums and headers		C	X ndt h	C	
	2- Tubes		C	X h ndt (3)	C	
	3- Furnaces (e.g. cylindrical and vertical boilers)		C	X ndt h (4)	C	
	4- Longitudinal stays and screw stays		C	X	C	
	5- Superheaters (heaters, tubes)		C	X ndt h (3)	C	
	6- Economizers		C	X ndt h	C	
F11	7- Air heaters (5)		C	X ndt h	C	
	8- Valves (6)	(6)	C / W (6)	X h	C	
	9- Safety valves (7)	DA	C	X h (8) (9)	C	
	10- Miscellaneous pipes and flanges connecting various parts (headers, superheaters, etc.)		C (10)	X h (11)	C	
	11- Automatic burning system			X h	C	
	12- Level indicator pillars	TA		X h	C	
	13- Remote level indicators	TA		X h	C / W (12)	
	14- Pressure gauges and thermometers			X h (13)	C	

MAIN TURBINES, MAIN BOILERS, AND THEIR AUXILIARIES - ITEM F						
No.	Item	Product certification				Remarks
		Design assessment / Approval	Raw material certificate	Examination and testing	Product certificate	
F12	Feed pumps of item **F11** and their prime movers	DA		X	C	(1) See item **G31** (2) Casing and assembling bolts (centrifugal pumps) (3) Main parts before assembling (4) Rotor balancing (centrifugal pumps) (5) Non electrical (i.e. hydraulic); for electrical motors, refer to item **K5**
	1- Feed pumps (1)		C (2)	X h (3) (4)	C	
	2- Prime movers (5)			X h	C	
F13	Feed water heaters (1)	DA	C (2)	X h	C	(1) And steam traps. See item **G30** for pressure vessels (2) Casing only (material certificate W, if vessel class 2 or 3) Note: Running tests - on board, during sea trials
F14	Forced circulation pumps of item **F11** and their prime movers	DA			C	(1) See item **G31** (2) Casing and assembling bolts (3) Non electrical (i.e. hydraulic); for electrical motors, refer to item **K5** Note: Running tests - on board during boiler tests
	1- Forced circulation pumps (1)		C (2)	X h	C	
	2- Prime movers (3)			X h	C	
F15	Forced draught fans			X	W	(1) Non electrical (i.e. hydraulic); for electrical motors, refer to item **K5** Note: Running tests - on board during boiler tests
	and their Prime movers (1)			X h	C	
F16	Burning units of item **F11**	DA (1)			C	(1) DA not required when the burning unit is already design approved as part of **F11** / **G15** (2) See items **G26** and **G27** (3) Non electrical (i.e. hydraulic); for electrical motors, refer to item **K5** (4) Calibration to be checked Note: Running tests - on board during boiler tests
	1- Pumps			X h	W	
	2- Heaters	DA		X h	W	
	3- Filters			X h	W	
	4- Valves and pipes, safety devices (2)		C	X h	W	
	5- Prime movers of pumps (3)			X h	W	
	6- Pressure gauges			X h (4)	W	

MAIN TURBINES, MAIN BOILERS, AND THEIR AUXILIARIES - ITEM F						
No.	Item	Product certification				Remarks
		Design assessment / Approval	Raw material certificate	Examination and testing	Product certificate	
F17	Gas turbines including propulsion gas turbines, gas turbines intended for auxiliary services essential for safety and navigation Item **F17** does not apply to mass-produced gas turbines (1)	TA (2)		X (3)	C	(1) 'Mass-produced' gas turbines are to be tested in accordance with agreed programme. The selection of the turbine to be tested from the production line is to be agreed upon with the Surveyor (2) Type tests: as per NR467 (3) Type tests, material tests, workshop inspection and testing, certification - as per NR467, Pt C, Ch 1, Sec 5 (4) Material tests (all) and NDT: magnetic particle or liquid penetrant (all) and Ultrasonic or X Ray examination (sample) (5) Thermal stability test of rotors (solid forged and welded rotors of propulsion turbines are to be subjected to a thermal stability test where the service temperature exceeds 400°C; this test is to be carried out after heat treatment and rough machining or at a later stage of fabrication, in accordance with a procedure agreed by the Society) (6) Balancing and overspeed test of rotors (7) Material tests (all) and NDT: magnetic particle or liquid penetrant (spot as agreed between the Manufacturer and the Surveyor) (8) Material tests (sample) and NDT: magnetic particle or liquid penetrant (sample) and Ultrasonic or X Ray examination (sample) (9) See items **G26** and **G27** (10) Material tests and NDT: as required in the relevant Sections of the Rules (11) Including overspeed tripping device test (12) See item **G1** (13) Such as pressure gauges, thermometers, speed indicators, vibration detectors. Automation systems: see relevant provisions of item **N** (14) Accuracy (calibration) to be checked (15) See item **G30** for pressure vessels
	1- Rotating parts (compressors and turbine rotors, shafts, stiff and flexible couplings, bolts for couplings and other dynamically stressed parts, integral pinions and gears)		C (4)	X ndt (5) (6)	C	
	2- Stationary parts (castings for casings intended for a temperature exceeding 230°C and plates for casings intended for a temperature exceeding 370°C or pressure exceeding 4 MPa)		W (7)	X h ndt	C	
	3- Blades		C (8)	X ndt	C	
	4- Piping, valves and associated fittings	(9)	C / W (9) (10)	X h ndt	C	
	5- Regulation and safety devices			X (11)	C	
	6- Flexible coupling (12)	DA	C / W	X	C / W	
	7- Measuring instruments (13)	TA		X (14)	C	
	8- Turbine and nozzle casings		W (4)	X h ndt	C	
	9- Intermediate coolers and heat exchangers (15)	DA	C	X h ndt	C	

Item G - Auxiliary Machinery

AUXILIARY MACHINERY - ITEM G						
No.	Item	Product certification				Remarks
		Design assessment / Approval	Raw material certificate	Examination and testing	Product certificate	
G1	Clutches and flexible couplings (1) (for propulsive and auxiliary plants)	DA (2)				(1) See item **G5** regarding main propulsion shafting components (2) As a general: when index DA is required, this may be done for a specific unit or using the type approval procedure (TA). Flexible couplings of non-standard type are to be considered on case-by-case basis with the Society (3) For metallic parts, i.e. shafts, flanges, power transmitting parts: material certificate C. Welds if any to be documented according to agreed specification (4) For hydraulic or pneumatic equipment (5) In case of mass-produced items manufactured in series according to a defined type, document type required as stated at the type approval stage - As per conditions set in the TA
	1- when torque ≥ 1 kN.m		C (3)	X h (4)	C	
	2- when torque < 1 kN.m	(5)	W	X h (4)	C / W (5)	
G2	Reduction gears, reverse reduction gears, and multipliers	DA	(1)	X (2)		(1) Material tests and non-destructive examination (pinions and wheel bodies, rims, plates and other elements intended for propulsion, gear casings of welded construction) as per NR216 (2) Survey of shafts and their connections (flange couplings, hubs, bolts pins) as per relevant provisions of item **G5** (3) Static balancing test of rotating components (in particular gear wheel and pinion shaft assemblies with the coupling part attached. Where $n^2 \cdot d \geq 1{,}5 \cdot 10^9$, gear wheel and pinion shaft assemblies are also to undergo a dynamic balancing test (4) Verification of cutting accuracy, meshing test, hydrostatic tests (hydraulic or pneumatic clutches, pressure piping, pumps casings, valves and other fittings) Note: Running tests under load on board: during the sea trials, the performance of reverse and/or reduction gearing is to be verified. Shipboard tests to be carried out as per NR467, Pt C, Ch 1, Sec 17 for Machinery systems
	1- Reduction and/or reverse gears intended for propulsion plants:					
	• with a transmitted power P ≥ 220 kW		C	X h ndt (3) (4)	C	
	• with a transmitted power P < 220 kW		W		W	
	2- Other reduction and step-up gears:					
	• with a transmitted power P ≥ 110 kW		C	X h ndt (2) (3)	C	
	• with a transmitted power P < 110 kW		W		W	
G3	Main thrust blocks (1)	DA	C (2)	X ndt (3) (4)	C	(1) See item **G5** regarding main propulsion shafting components (2) For frame only (3) If of welded construction (4) Examination after running test Note: Running tests under load on board

AUXILIARY MACHINERY - ITEM G						
No.	Item	Product certification				Remarks
		Design assessment / Approval	Raw material certificate	Examination and testing	Product certificate	
G4	Thrust shafts, intermediate shafts, shaft couplings and rigid shaft couplings (dismountable type) (1)	DA	C	X ndt (2)	C	(1) See item **G5** regarding main propulsion shafting components (2 If welded construction or shrunk elements Note: a- on board: contact on bearing to be examined b- checking of fitting
	Cardan shafts (flanges, crosses, shafts, yokes) (1)	DA	C	X ndt	C	
G5	Main propulsion shafting (1) (shafts, couplings, clutches and other shafting components transmitting power for main propulsion)	DA		X h ndt (2)	C	(1) For shafting components in diesel engines, turbines, gears and thrusters, refer to relevant items of this NR266 (2) Parts of hydraulic couplings, clutches of hydraulic reverse gears and control units, hubs and hydraulic cylinders of controllable pitch propellers, including piping systems and associated fittings, are to be hydrostatically tested to 1,5 times the maximum working pressure. Works' certificates W required (3) Material tests (all) and NDT: magnetic particle or liquid penetrant (all, if diameter > 100 mm) and ultrasonic examination (all, if diameter > 200 mm). In case of rolled bars used in place of forgings: material tests (all) and NDT (all, if diameter > 150 mm) (4) Stern tube sealing glands: see item **G40** (5) Material tests (all); NDT not required (6) Also see relevant provisions of items A10 and A11 (for Steel castings and Steel forgings) (7) Stern tubes, when machine-finished, and propeller shaft liners, when machine-finished on the inside and with an overthickness not exceeding 3 mm on the outside, are to be hydrostatically tested to 0,2 N/mm^2. Works' certificates W required (8) Design assessment index, for stern tube bearings: TA for synthetic materials only, as per NR467, Pt C, Ch 1, Sec 7, [2.4] (9) For shafting component completely built under control together with the propulsion shaft and data fully addressed in the main manufacturer's file (10) For special bolts (i.e. expansion type), product certificate C is required (11) For metallic parts, i.e. shafts, flanges, power transmitting parts: material certificate C or W depending on the agreed survey scheme. Welds if any to be documented according to agreed specification (12) See item **G1** Note: During sea trials, the lubricant consumption is to be recorded
	1- Coupling (separate from shafts)	DA	C (3)	X ndt	C	
	2- Propeller shafts	DA	C (3)	X ndt	C	
	3- Intermediate shafts	DA	C (3)	X ndt	C	
	4- Thrust shafts	DA	C (3)	X ndt	C	
	5- Cardan shafts (flanges, crosses, shafts, yokes)	DA	C (3)	X ndt	C	
	6- Stern tubes (4)	DA	W (5)(6)	X h ndt (7)	W	
	7- Stern tube bushes and other shaft bearings	TA (8) / DA	W (5)	X	W (9)	
	8- Propeller shaft liners	DA	W (5)	X h (7)	W	
	9- Coupling bolts or studs	DA	W (5)	X	W / C (10)	
	10- Flexible couplings	DA	C / W (5) (11)	X	C / W (12)	
	11- Thrust sliding-blocks (frame)	DA	W (5)	X	W	

AUXILIARY MACHINERY - ITEM G						
No.	Item	Product certification				Remarks
		Design assessment / Approval	Raw material certificate	Examination and testing	Product certificate	
G6	Shaft bearings	DA (1)	W (2) (3)	X	W / C (1) (4)	(1) Case-by-case individual design appraisal and survey may be required,i.e. when the data of Shaft Bearings are not available in manufacturer's file and are therefore addressed separately by the bearings supplier (2) Material tests (all); NDT not required (3) See also provisions of item **G5** regarding main propulsion shafting components (sub-item 7- Stern tube bushes and other shaft bearings) (4) Product certificate C covers the examination and test performed in the bearings supplier's workshop only, and witnessed by the Surveyor Note: Checking of the alignment on board
G7	Coupling bolts for items **G1**, **G2**, **G4** and **G5**	DA	W (1)	X ndt (2)	W / C (3)	(1) See also provisions of item **G5** regarding main propulsion shafting components (2) Material tests (mechanical properties and chemical composition) and NDT - as per NR216, Ch 5. (3) For special bolts (i.e. expansion type), product certificate C is required Note: Checking of fitting on board
G8	Stern tubes	DA	W (1) (2)	X h ndt (3) (4)	W	(1) See also provisions of item **G5** (main propulsion shafting components) (2) See also relevant provisions of items A10 and A11 (for Steel castings and Steel forgings) (3) Stern tubes, when machine-finished, are to be hydrostatically tested to 0,2 N/mm^2. Works' certificates W required (4) Watertightness (for cast steel or cast iron tubes) Note: Checking of fitting on board
G9	Propellers (1) (2) (propellers of any size and type intended for propulsion, including fixed and controllable pitch propellers, as well as those ducted in fixed nozzles)	DA or TA (3)		X h ndt (4) (5)	C	(1) As per NR467, Pt C, Ch 1, Sec 8. These requirements do not apply to propellers and impellers in rotating or bow and stern thrusters (which are covered in NR467, Pt C, Ch 1, Sec 14); or to propellers for ships with ice strengthening (which are covered in NR467, Pt F, Ch 8, Sec 3) (2) Navigation in polar waters: refer to the requirements for the assignment of additional class notation **POLAR CLASS**, as per NR527 - Rules for the Classification of Ships Operating in Polar Waters and Icebreakers (3) 'Mass produced' propellers: type approval as per NR467 and program accepted by the Society
	1- Solid propeller	DA	C (6)	X ndt	C	
	2- Built-up propeller, and controllable pitch propellers (CPP) with hydraulic system. (7) (8)	DA	C (6) (9)	X ndt (10)	C	

AUXILIARY MACHINERY - ITEM G						
No.	Item	Product certification				Remarks
		Design assessment / Approval	Raw material certificate	Examination and testing	Product certificate	
G9						(4) a- balancing: finished propellers are to be statically balanced in accordance with the specified ISO 484 tolerance class. However, for built-up and controllable pitch propellers, the required static balancing of the complete propeller may be replaced by an individual check of blade weight and gravity centre position. Refer also to NR216, Ch 8, Sec 3, [1.9.4] b- contact of the propellers shaft cone to be checked (5) Running test: for controllable pitch propellers (CPP) (6) Materials tests and non-destructive examination as per NR216. Manufacturers of castings for propellers are to be recognised by the Society in accordance with NR320. The manufacturing process is to be approved in accordance with NR480. (7) Actuating systems of CPP are considered as primary 'essential services' (services which need to be maintained in continuous operation) (8) See items **G42** (Hydraulic systems) (9) Additionally, the materials for studs and for all other parts of the mechanism transmitting torque are to be tested in the presence of the Surveyor (10) The complete hydraulic system for the control of the controllable pitch propeller mechanism is to be hydrotested at a pressure equal to 1,5 times the design pressure. The proper operation of the safety valve is to be tested in the presence of the Surveyor. See items **G26**, **G27** and **G31**
G10	Turbines driving electric generators (1)	DA or TA	C	X	C	(1) For such turbines, the relevant provisions are those of item **F1** for steam turbines or item **F17** for gas turbines, as applicable
G11	Diesel engines driving electric generators (1)	TA	C	X	C	(1) For such diesel engines, the relevant provisions are those of item **E1**, as applicable
G12	Lubricating oil pumps and their prime movers (1)					(1) Lube oil pumps for the propulsive plant (2) See item **G31** (3) Non electrical (i.e. hydraulic); for electrical motors, refer to item **K5**
	1- Lubricating oil pumps	(2)	(2)	X (2)	(2)	
	2- Prime movers (3)			X h	C	

AUXILIARY MACHINERY - ITEM G						
No.	Item	Product certification				Remarks
		Design assessment / Approval	Raw material certificate	Examination and testing	Product certificate	
G13	Starting air receivers of item **G11** (1) (2)	DA or TA (3)	C	X h ndt (4)	C	(1) See item **G30** for pressure vessels (2) Also see provisions of item **E5**, as applicable (3) Air Starters are part of Starting equipment of diesel engines. Equipment for primary 'essential services' as per NR467, Pt C, Ch 2, Sec 1. Product certificate required for Air Starters: C/W, as per conditions set in the TA (IBV/HBV) (4) Including calibration of safety devices
G14	Air compressors for filling of item **G13** and their prime movers (1) (2)	DA				(1) Together with coolers, if any (2) Also see provisions of item **E6**, as applicable (3) Compressor housing: material certificates (C / W) according to the piping class. See item **G31** (4) Non electrical (i.e. hydraulic); for electrical motors, refer to item **K5**
	1- Air compressors		W (3)	X h	C	
	2- Prime movers (4)			X h	C	
G15	Auxiliary boilers (1) (2)	DA		X h ndt	C	(1) Item **G15** applies to auxiliary boilers (class 1) which are part of the ship's essential services and/or located in machinery spaces. Vessel classification as per criteria of item **G30** (2) Automation systems: see relevant provisions of item **N** (3) If forming or welding operations (4) For cylindrical boilers only (internal test) (5) See item **G27** (6) Capacity test on prototype (7) Setting and accumulation test (8) Calibration to be checked Note: Running tests - on board
	1- Boilers and drums		C	X h ndt (3)	C	
	2- Tubes		C	X h	C	
	3- Furnaces (cylindrical and vertical boilers for instance)		C	X h ndt (4)	C	
	4- Screw stays and longitudinal stays		C	X h	C	
	5- Valves and miscellaneous accessories	(5)	C / W (5)	X h	C	
	6- Safety valves	(4)	C	X h (6) (7)	C	
	7- Level indicators	TA		X	C	
	8- Pressure gauges and thermometers			X (8)	C	

AUXILIARY MACHINERY - ITEM G						
No.	Item	Product certification				Remarks
		Design assessment / Approval	Raw material certificate	Examination and testing	Product certificate	
G16	Burning units for item **G15** (1)	DA	C / W (1)	X	C	(1) See item **F16**
G17	Auxiliary condensers and their tubes					(1) Or examination as per agreed procedure Note: Running tests under load on board; general examination
	1- Auxiliary condensers		W	X h	C	
	2- Tubes		W	X h (1)	C	
G18	Auxiliary units of item **G17**					(1) See item **G31** (2) Non electrical (i.e. hydraulic). For electrical motors, see item **K5** Note: Running tests on board
	1- Pumps	(1)	(1)	X (1)	(1)	
	2- Air ejectors			X	W	
	3- Valves and miscellaneous accessories			X h	C	
	4- Prime movers of 1-			X h (2)	C	
G19	Feed pumps of item **G15** and their prime movers					(1) See item **G31** (2) Non electrical (i.e. hydraulic). For electrical motors, see item **K5**
	1- Feed pumps	(1)	(1)	X (1)	(1)	
	2- Prime movers (2)			X h	C	
G20	Evaporators, fresh water generators, their auxiliaries and accessories (1)	DA			C (3)	(1) Fresh water generator: class product certificate when required by the Rules NR467, and when not in class III. (2) As per criteria of item **G30** (3) See item **G31** Note: Running tests on board; general examination
	1- Distillation bodies and heating coils	DA (2)	C / W (2)	X h ndt	C	
	2- Pumps	(3)	(3)	(3)	(3)	
	3- Air ejectors			X	W	
	4- Valves and miscellaneous accessories			X h	C	

AUXILIARY MACHINERY - ITEM G						
No.	Item	Product certification				Remarks
		Design assessment / Approval	Raw material certificate	Examination and testing	Product certificate	
G21	Steam heated steam generators	DA (1)	C (2)	X h ndt	C	(1) Same criteria as for item **G15** (2) As per criteria of item **G30** Note: Running tests under load, on board
G22	Bilge pumps and their prime movers					(1) See item **G31** (2) Performance test for bilge and fire pumps according to NR467, Pt C, Ch 1, Sec 10. See item **G31** (3) Non electrical (i.e. hydraulic). For electrical motors, see item **K5**
	1- Bilge pumps	(1)	(1)	X (1) (2)	(1)	
	2- Prime movers (3)			X h	C	
G23	Ballast pumps and their prime movers (1)					(1) See item **G31** (2) Non electrical (i.e. hydraulic). For electrical motors, see item **K5**
	1- Ballast pumps	(1)	(1)	X (1)	(1)	
	2- Prime movers (2)			X h	W	
G24	Fuel transfer pumps and their prime movers					(1) See item **G31** (2) Non electrical (i.e. hydraulic). For electrical motors, see item **K5**
	1- Fuel transfer pumps	(1)	(1)	X (1)	(1)	
	2- Prime movers (2)			X h	C	
G25	Fuel oil purifying unit; Centrifugal separator (oil and fuel)	DA or TA		X (1)	C	(1) Running test, possibly with a fuel water mixture (2) See item **G28** (3) See relevant provisions of item **K** (4) See item **N** (5) Checking of the following automatic functions when they are required by an automation mark: level of sludge tank and overflow from the bowl (protection and alarm) (6) As per technology; see relevant provisions of items **G26** (Piping) or **G30** (Vessels)
	1- Flexible hoses	TA (2)	W (2)	X h	C (2)	
	2- Electrical equipment (motor, switchboards, cables) (3)	(3)		X	C	
	3- Automation equipment (4)	(4)		X (5)	C	
	4- Centrifugal separators (6)	(6)	W	X h	C	

AUXILIARY MACHINERY - ITEM G						
No.	Item	Product certification				Remarks
		Design assessment / Approval	Raw material certificate	Examination and testing	Product certificate	
G26	Raw pipes and piping systems (1) (2) P: Design pressure, in MPa T: Design temperature, in °C N: Nominal diameter of the pipe, valve or fitting, in mm					(1) General Notes: • Piping systems are subdivided into three classes, denoted as class I, class II and class III. Definitions of the classes of piping systems as per NR467, Pt C, Ch 1, Sec 10, Tab 3 (systems not covered by this Tab 3: cargo piping for oil tankers, gas tankers and chemical tankers, and fluids for refrigerating plants) • For cargo piping of specialized ships, see item **H** for liquefied gas carriers and item **I** for oil/FLS tankers and chemical tankers. See item **G35** for refrigerating installations • Valves under static pressure on oil fuel tanks or lubricating oil tanks belong to class II • Valves and fittings fitted on the ship side and collision bulkhead belong to class II. See NR467, Pt C, Ch 1, Sec 10, [20.5.3], item b) • The open ended pipes, irrespective of T, generally belong to class III (as drains, overflows, vents, exhaust gas lines, boiler escape pipes, etc.) • Metallic materials are to be used in accordance with NR467, Pt C, Ch 1, Sec 10, Tab 5 • Materials for class I and class II piping systems are to be manufactured and tested in accordance with the appropriate requirements of NR216 (materials for class III piping systems are to be manufactured and tested in accordance with the requirements of acceptable National or International standards or specifications) • As general, survey during fabrication is required for all piping systems of welded construction (2) Also see particular requirements as per NR216, Chapter 4 regarding seamless and welded steel pipes, tubes and fittings intended for boilers, pressure vessels and systems operating at ambient, high or low temperature. (3) Safeguards for reducing leakage possibility and limiting its consequences: e.g. pipes led in positions where leakage of internal fluids will not cause a potential hazard or damage to surrounding areas which may include the use of pipe ducts, shielding, screening, etc. (4) If of welded construction
	1- Toxic media					
	Class I: without special safeguards (3), ND ≥ 50		C	X h ndt (4)	C	
	Class I: without special safeguards (3), ND < 50		W	X h ndt (4)	W	
	Class II: not applicable					
	Class III: not applicable					
	2- Corrosive media					
	Class I: without special safeguards (3), ND ≥ 50		C	X h ndt (4)	C	
	Class I: without special safeguards (3), ND < 50		W	X h ndt (4)	W	
	Class II: with special safeguards (3), ND ≥ 100		C	X h ndt (4)	C	
	Class II: with special safeguards (3), ND < 100		W	X h ndt (4)	W	
	Class III: not applicable					
	3- Flammable media (5) heated above flashpoint, or having flashpoint < 60°C Liquefied gas					
	Class I: without special safeguards (3), ND ≥ 50		C	X h ndt (4)	C	
	Class I: without special safeguards (3), ND < 50		W	X h ndt (4)	W	
	Class II: with special safeguards (3), ND ≥ 100		C	X h ndt (4)	C	
	Class II: with special safeguards (3), ND < 100		W	X h ndt (4)	W	
	Class III: not applicable					
	4- Oxyacetylene					
	Class I: irrespective of p, ND ≥ 50		C	X h ndt (4)	C	
	Class I: irrespective of p, ND < 50		W	X h ndt (4)	W	
	Class II: not applicable					
	Class III: not applicable					

AUXILIARY MACHINERY - ITEM G						
No.	Item	Product certification				Remarks
		Design assessment / Approval	Raw material certificate	Examination and testing	Product certificate	
G26	5- Steam					(5) Flammable media generally include the flammable liquids as oil fuel, lubricating oil, thermal oil and flammable hydraulic oil
	Class I: p > 1,6 or T > 300, ND ≥ 50		C	X h ndt (4)	C	(6) Pressure and temperature conditions other than those required for class I and class III
	Class I: p > 1,6 or T > 300, ND < 50		W	X h ndt (4)	W	(7) Design pressure for fuel oil systems is to be determined in accordance with NR467, Pt C, Ch 1, Sec 10, Tab 4
	Class II: other (6), ND ≥ 100		C	X h ndt (4)	C	(8) Steering gear hydraulic piping system belongs to class I irrespective of p and T
	Class II: other (6), ND < 100		W	X h ndt (4)	W	(9) Including water, air, gases, non-flammable hydraulic oil
	Class III: p ≤ 0,7 and T ≤ 170			X h	W	(10) Plastics may be used for piping systems belonging to class III in accordance with NR467, Pt C, Ch 1, App 3. Plastic includes both thermoplastic and thermosetting plastic materials with or without reinforcement, such as PVC and FRP (reinforced plastics pipes). Approval and use of plastic pipes: as per provisions of NR467, Pt C, Ch 1, App 3. See item **G39**
	6- Thermal oil					(11) As per conditions set in the TA
	Class I: p > 1,6 or T > 300, ND ≥ 50		C	X h ndt (4)	C	
	Class I: p > 1,6 or T > 300, ND < 50		W	X h ndt (4)	W	
	Class II: other (6), ND ≥ 100		C	X h ndt (4)	C	
	Class II: other (6), ND < 100		W	X h ndt (4)	W	
	Class III: p ≤ 0,7 and T ≤ 150			X h	W	
	7- Fuel oil (7), lubricating oil, flammable hydraulic oil (8)					
	Class I: p > 1,6 or T > 150, ND ≥ 50		C	X h ndt (4)	C	
	Class I: p > 1,6 or T > 150, ND < 50		W	X h ndt (4)	W	
	Class II: other (5-6), ND ≥ 100		C	X h ndt (4)	C	
	Class II: other (5-6), ND < 100		W	X h ndt (4)	W	
	Class III: p ≤ 0,7 and T ≤ 60			X h	W	
	8- Other media (8) (9)					
	Class I: p > 4,0 or T > 300, ND ≥ 50		C	X h ndt (4)	C	
	Class I: p > 4,0 or T > 300, ND < 50		W	X h ndt (4)	W	
	Class II: other (6), ND ≥ 100		C	X h ndt (4)	C	
	Class II: other (6), ND < 100		W	X h ndt (4)	W	
	Class III: p ≤ 1,6 and T ≤ 200			X h	W	
	9- Pipes between fuel pumps and diesel engine injectors	TA	C	X h	C	
	10 - Plastic pipes (10)	TA (10)	C / W (11)	X h (10)	C / W (11)	

AUXILIARY MACHINERY - ITEM G						
No.	Item	Product certification				Remarks
		Design assessment / Approval	Raw material certificate	Examination and testing	Product certificate	
G27	Accessories of pipes Valves and fittings (1) (2) ND: Nominal diameter of the pipe, valve or fitting, in mm					(1) Such as valves, steam traps, relief valves, safety devices, etc. (2) For cargo valves: refer to relevant provisions of items H17 and I14 (Cargo handling and containment systems) (3) DA not required. Valves and accessories are normally to be built in accordance with a recognised standard. Otherwise, they are subject to special consideration for approval by the Society (on a case-by-case basis) (4) If of welded construction
	Class I: ND ≥ 50 **Class II**: ND ≥ 100	(3)	C	X h ndt (4)	C	
	Class I: ND < 50 **Class II**: ND < 100	(3)	W	X h ndt (4)	C	
	Class III			X h	W	
G28	Flexible hoses assembly (1)	TA (2) (3)	W	X h (4)	C (5) (6)	(1) Short length of metallic or non-metallic hose with end fittings ready for installation (2) Prototype testing: see NR467, Pt C, Ch 1, Sec 10, [2.6] (type approval) and [20.2] (type tests) (3) Specific requirements for flexible hoses intended for cargo pipe lines are given in NR467, Part D, Chapter 7 (Oil tankers), Part D, Chapter 8 (Chemical tankers) and Part D, Chapter 9 (Liquefied gas carriers) (4) Each flexible hose together with its connections, is to undergo a hydraulic test under a pressure at least equal to 1,5 times the maximum service pressure. (during the test, the flexible hose assembly is to be repeatedly deformed from its geometrical axis) as per NR467, Pt C, Ch 1, Sec 10, [20.5.6], item a) (5) As per conditions set in the TA (6) Where a flexible hose assembly is made up of items from different manufacturers, the components are to be clearly identified and traceable to evidence of prototype testing
G29	Pipes, valves and fittings connected to: • the ship side • the collision bulkhead • fuel oil and lubricating oil tanks and under static pressure	DA (1)	C (2)	X h (3) ndt (4)	C	(1) Index DA for nominal diameter ≥ 100 mm (2) If nominal diameter ND ≥ 100 mm: material certificate C (class). If nominal diameter ND < 100 mm: material certificate W (works') (3) Examination and testing as per relevant provisions of NR467, Pt C, Ch 1, Sec 10, [40]. (4) If of welded construction

AUXILIARY MACHINERY - ITEM G						
No.	Item	Product certification				Remarks
		Design assessment / Approval	Raw material certificate	Examination and testing	Product certificate	
G30	Pressure vessels (1) (2) p: Design pressure, in MPa V: Volume, in litres T: Design temperature, in °C t_A: Actual thickness of the vessel, in mm		(3) (4)		(5)	(1) Item **G30** applies to all fired or unfired pressures vessels of metallic construction, all boilers and other steam generators, including the associated fittings and mountings with maximum allowable pressure greater than 0,5 bar above atmospheric pressure; with the exception of those indicated in NR467, Pt C, Ch 1, Sec 3, [1.2.2] which are to be considered on a case-by-case basis. The acceptance of national and international standards as an alternative to the requirements of the Rules may be considered by the Society on a case-by-case basis. Pressure vessels are subdivided into three classes, denoted as class I, class II and class III. Definitions of the classes as per NR467, Pt C, Ch 1, Sec 3, Tab 2 (whenever the class is defined by more than one characteristic, the equipment is to be considered belonging to the highest class of its characteristics, independently of the values of the other characteristics) (2) For starting air receivers and liquefied gas cargo tanks, see also items **E5** and **H1**, and items **H34**, **U1** and **U38**. (3) For class 1 'mass produced' small pressure vessels and heat exchangers: materials certificate C may be waived, and materials certificate W accepted at the Society's discretion for 'mass produced' small pressure vessels (such as accumulators for valve controls, gas bottles, etc.) (4) In addition to the requirement of this column: testing of materials intended for the construction of pressure parts of boilers, other steam generators, oil fired thermal oil heaters and exhaust gas thermal oil heaters is to be witnessed by the Surveyor; material certificate C (5) Product certificate W (works') may be accepted for 'mass produced' small pressure vessels of class 1, 2 and 3 which are type approved by the Society
	1- Steam generators or boilers					
	Class 1: (p > 3,2 and V > 2) or (p V > 20 and V > 2)	DA	C	X h ndt	C	
	Class 2: if not class 1 or class 3	DA	W (4)	X h ndt	C	
	Class 3: p V ≤ 5 or V ≤ 2		W (4)	X h ndt	C	
	2- Pressure vessels for toxic substances					
	Class 1: all in class 1	DA	C	X h ndt	C	
	3- Pressure vessels for corrosive substances					
	Class 1: p > 20 or p V > 20 or T > 350	DA	C	X h ndt	C	
	Class 2: if not in class 1	DA	W	X h ndt	C	
	4- Pressure vessels for gaseous substances					
	Class 1: p > 100 or p V > 300	DA	C	X h ndt	C	
	Class 2: V > 1 and p V > 100 and not in class 1	DA	W	X h ndt	C	
	Class 3: all pressure vessels which are not class 1 or class 2		W	X h ndt	C	
	5- Pressure vessels for liquid substances					
	Class 1: V > 10 and p V > 1000 and p > 50	DA	C	X h ndt	C	
	Class 2: (V ≤ 10 and p > 100) or (1 < p ≤ 50 and p V > 1000)	DA	W	X h ndt	C	
	Class 3: all pressure vessels and heat exchangers which are not class 1 or class 2		W	X h ndt	C	
	6- Pressure vessels for thermal oil					
	Class 1: p > 1,6 or T > 300	DA	C	X h ndt	C	
	Class 2: if not class 1 or class 3	DA	W (4)	X h ndt	C	
	Class 3: p ≤ 0,7 and T ≤ 150		W (4)	X h ndt	C	

AUXILIARY MACHINERY - ITEM G						
No.	Item	Product certification				Remarks
		Design assessment / Approval	Raw material certificate	Examination and testing	Product certificate	
G30	7- Pressure vessels for fuel oil, lubricating oil or flammable hydraulic oil					
	Class 1: p > 1,6 or T > 150	DA	C	X h ndt	C	
	Class 2: if not class 1 or class 3	DA	W	X h ndt	C	
	Class 3: p ≤ 0,7 and T ≤ 60		W	X h ndt	C	
	8- Whatever type of equipment					
	Class 1: t_A > 40	DA	C	X h ndt	C	
	Class 2: 15 ≤ t_A ≤ 40	DA	W	X h ndt	C	
G31	Pumps and compressors (1) within piping systems covered by Sections of NR467, Part C, Chapter 1	(2)				(1) Also see provisions of item **E6**, as applicable - Air compressors (crankcases explosion relief valves) (2) For other pumps and compressors, see additional Rules relevant for related system (3) If not already addressed within the scope of the piping system approval (4) Type tests of hydraulic pumps for Steering gears as per NR467. See provisions of item B1 (5) Performance test for bilge and fire pumps according to NR467, Pt C, Ch 1, Sec 10. See items **G22**, **C32** and **J1** (6) DA not applicable to bilge pumps. DA is required for fire pumps. Also see provisions of item C32 (7) See item **F12** (8) If of welded construction (9) General examination of main parts before assembling. In addition, balancing test for rotors of centrifugal feed pumps for main boilers, as required in NR467, Pt C, Ch 1, Sec 10 (10) See item **F14**
	1- When belonging to a class I piping system	DA (3) (4)	C	X h	C	
	2- When belonging to a class II piping system		W	X h	C	
	3- Bilge and fire pump (5)	DA (6)	W	X h (5)	C	
	4- Feed pumps for main boilers (7)	DA (3)	C	X h ndt (8) (9)	C	
	5- Forced circulation pumps for main boilers (10)	DA (3)	C	X h	C	
	6- When belonging to one of the following class III piping systems if design pressure exceeds 0,35 MPa: - boiler feed water or forced circulating - fuel oil or other flammable oil - compressed air		W	X h	C	
	7- When belonging to other class III piping systems			X h	W	
G32	Centrifugal separators (1)	(2)	W	X h	C	(1) See item **G25** (2) As per technology - see relevant provisions of items **G26** (Piping) or **G30** (Vessels)

AUXILIARY MACHINERY - ITEM G						
No.	Item	Product certification				Remarks
		Design assessment / Approval	Raw material certificate	Examination and testing	Product certificate	
G33	Prefabricated pipe lines (1) ND: Nominal diameter of the pipe, valve or fitting, in mm	(2)				(1) Item **G33** applies to prefabricated pipes and associated fittings (2) Valves and accessories are normally to be built in accordance with a recognised standard. Otherwise, they are subject to special consideration for approval by the Society (on a case-by-case basis) (3) If of welded construction
	• class I and class II with ND ≥ 65 or t ≥ 10	DA	W	X h ndt (3)	C	
	• class I and class II with ND < 65 and t < 10		W	X h ndt (3)	W	
	• class III where P > 0,35 MPa, as follows: - steam pipes and feed water pipes - compressed air pipes - fuel oil or other flammable oil pipes			X h	W	
G34	Thrusters (1) (2) and their prime movers (3) A thruster is a propeller installed in a revolving nozzle or in a special transverse tunnel in the ship, or a water-jet (propulsion propellers in fixed nozzles are not considered as thrusters; see item **G9**) The requirements given in item **G34** apply to the following types of thrusters developing a power P ≥ 110 kW (4):	DA or TA (5)		X h ndt (6)	C	(1) Thrusters: as per NR467, Pt C, Ch 1, Sec 15. For azimuth thrusters intended for dynamic positioning, the additional requirements in NR467, Part F, Chapter 4 are to be complied with. Thrusters intended for propulsion and steering of ships with an **ICE CLASS** notation are to comply with the additional requirements of NR467, Part F, Chapter 8. Transverse thrusters intended for manoeuvring of ships with an **ICE CLASS** notation are required to comply with the additional requirements in NR467, Pt F, Ch 8, Sec 3, [2.4.1] - (for design requirements) (2) Navigation in polar waters: refer to the requirements for the assignment of additional class notation **POLAR CLASS**, as per NR527 Rules for the Classification of Ships Operating in Polar Waters and Icebreakers (3) Prime movers are to be tested in accordance with the requirements applicable to the type of mover used. For other thruster components such as gears, shaft, couplings, etc., refer to the applicable requirements of NR467 (4) Thrusters developing power less than 110 kW are to be built in accordance with sound marine practice and tested as required by the Rules to the satisfaction of the Surveyor (5) 'Mass produced' propellers may be accepted within the framework of the type approval program of the Society (6) Survey of thrusters as per the applicable requirements of NR467, Pt C, Ch 1, Sec 8, [4.2]. The survey requirements of NR467, Pt C, Ch 1, Sec 8 also apply to Thrusters of ships with an **ICE CLASS** notation -as per NR467, Part F, Chapter 8
	1- Transverse thrusters intended for manoeuvring	DA	W (7) (8)	X ndt	C	
	2- Thrusters intended for propulsion and steering	DA	C (8) (9)	X ndt	C	

AUXILIARY MACHINERY - ITEM G						
No.	Item	Product certification				Remarks
		Design assessment / Approval	Raw material certificate	Examination and testing	Product certificate	
G34						(7) Material testing for parts of transverse/athwartship thrusters does not need to be witnessed by a Surveyor, provided test reports are made available to him (8) For requirements relative to material intended for propellers See NR467, Pt C, Ch 1, Sec 8, [2.1.1]. For the requirements relative to materials intended for other parts of the thrusters, such as gears, shaft, couplings, etc., refer to the applicable parts of NR467 (9) All materials intended for parts transmitting torque and for propeller/impeller blades are to be tested in accordance with the requirements of NR216. See item **G9**
G35	Refrigerating installations on all ships; minimum requirements (1)	DA				(1) Where one or more of the following additional class notations **REF-CARGO**, **REF-CONT**, **REF-STORE**, -**AIRCONT**, -**PRECOOLING**, -**QUICKFREEZE** is (are) requested, the applicable requirements of NR467, Part F, Chapter 7 are to be complied with. See item **M** (2) See item **G30**. Vessels intended to contain ammonia or toxic substances are to be considered as class 1 pressure vessels (3) Where ammonia is the refrigerant, copper, bronze, brass and other copper alloys are not to be used) (4) Notch toughness of steels used in low temperature plants is to be suitable for the thickness and the lowest design temperature (5) Materials used for the pipes are to be appropriate to the fluids that they convey. Copper, brass, bronze and other copper alloys are not to be used for pipes likely to convey ammonia (methods proposed for joining such pipes are to be submitted to the Society for consideration) (6) Notch toughness of the steels used is to be suitable for the application concerned (7) If not already addressed within the scope of the system drawing approval (8) See also item **G26** (9) If of welded construction (10) Use of plastic pipes to be considered by the Society on a case-by-case basis. See item **G39** (11) Statutory requirements: particular attention is to be paid to any limitation on the use of refrigerants imposed by the Administration of the State whose flag the ship is flying
	1- Pressure vessels and heat exchangers (2)	DA (3) (4) (5) (6) (7)	C / W (3) (4)	X h ndt	C	
	2- Piping systems, refrigerant pipes are to be considered as belonging to the following classes: (8)		(8)			
	- class I: where they are intended for ammonia (NH3) or toxic substances		C (5) (6)	X h ndt (9)	C	
	- class II: for other refrigerants		C (5) (6)	X h ndt (9)	C	
	- class III: for brine		W	X h	W	
	- plastic pipes (10)	TA (10)	W (10)	X h (10)	C (10)	
	3- Refrigerants (11) - toxic or flammable refrigerants: subject to special consideration by the Society - ammonia (R717): subject to specific requirements - prohibited refrigerants: Methyl chloride, R11-Trichloromonofluoromethane (C Cl3 F), Ethane, Ethylene, and other substances with lower explosion limit in air of more than 3,5%		W		W	

AUXILIARY MACHINERY - ITEM G						
No.	Item	Product certification				Remarks
		Design assessment / Approval	Raw material certificate	Examination and testing	Product certificate	
G36	Mechanical joints (1)	TA HBV (2)	W (3)	X h ndt (4)	W (5)	(1) Mechanical joints, i.e. pipe unions, compression couplings, slip-on joints or similar joints (as per NR467, application of mechanical joints and their acceptable use for each service is depending on the class of piping, pipe dimensions, working pressure and temperature) (2) See NR467, Pt C, Ch 1, Sec 10. Mechanical joints are to be approved based on type approval procedure defined in NR467, Pt C, Ch 1, App 5. Prototype tests to be carried out in accordance with a program agreed by the Society (3) The materials used for mechanical joints are to comply with the requirements of NR467, Pt C, Ch 1, Sec 10, [2.4.5]. The manufacturer has to submit evidence to substantiate that all components are adequately resistant to working the media at design pressure and temperature specified. See also item **G27** (4) If of welded construction (5) As per conditions set in the TA Note: The installation of mechanical joints is to be in accordance with the manufacturer's assembly instructions. Where special tools and gauges are required for installation of the joints, they are to be supplied by the manufacturer
G37	Expansion joints (1)	TA (2) (3) (4) (5) (6) (7)	W	X h ndt (8)	C (4)	(1) An assembly of metallic or non-metallic material designed to safely absorb the heat-induced expansion and contraction to allow relative movement (2) Prototype testing: see NR467, Pt C, Ch 1, Sec 10, [2.6] (type approval) and [20.2] (type tests) (3) All flexible hose assemblies or expansion joints are to be satisfactorily prototype burst tested to an international standard to demonstrate they are able to withstand a pressure not less than 4 times its design pressure without indication of failure or leakage. Exemptions from this requirement may be granted for expansion joints of large diameter used on sea water lines and to large diameter expansion joints used on exhaust gas lines, except for those which are fitted directly on engines (TA required) (4) As per conditions set in the TA. Where an expansion joint is made up of items from different manufacturers, the components are to be clearly identified and traceable to evidence of prototype testing

AUXILIARY MACHINERY - ITEM G						
No.	Item	Product certification				Remarks
		Design assessment / Approval	Raw material certificate	Examination and testing	Product certificate	
G37						(5) Specific requirements for expansion joints intended for cargo pipe lines are given in NR467, Part D, Chapter 7 (Oil tankers), Part D, Chapter 8 (Chemical tankers) and Part D, Chapter 9 (Liquefied gas carriers) (6) For exhaust gas system, required test at 1,5xP only. (7) Expansion joints not accepted on HP fuel oil injection systems. (8) Each expansion joint, together with its connections, is to undergo a hydraulic test under a pressure at least equal to 1,5 times the maximum service pressure (during the test, the joint is to be repeatedly deformed from its geometrical axis) as per NR467, Pt C, Ch 1, Sec 10, [20.5.6], item a)
G38	Expansion bellows (1)	TA	W	X h ndt	C	(1) See relevant provisions of item G37 (Expansion joints)
G39	Plastic pipes (1) (2)	TA (3)	C / W (4)	X h (3)	C / W (4)	(1) Plastics may be used for piping systems belonging to class III in accordance with NR467, Pt C, Ch 1, App 3. The use of plastics for other systems or in other conditions will be given special consideration (2) Plastic includes both thermoplastic and thermosetting plastic materials with or without reinforcement, such as PVC and FRP (reinforced plastics pipes) (3) Type approval of plastic pipes: as per NR467, Pt C, Ch 1, App 3. See item **G26** (4) As per conditions set in the TA

AUXILIARY MACHINERY - ITEM G						
No.	Item	Product certification				Remarks
		Design assessment / Approval	Raw material certificate	Examination and testing	Product certificate	
G40	Stern tube sealing glands (1) • Stern tube seals • Sealing glands • Oil sealing glands	DA or TA (2) (3) (4)	C / W (5)	X	C / W (5)	(1) See also item **G5** (2) Based on the type of shaft and its design, the tailshafts (propeller shafts and tube shafts) may be eligible for modified periodicity of complete survey in service; see NR467, Pt A, Ch 2, Sec 2, [5.5]. Suitable sealing glands are glands which are type-approved by the Society with regard to protection of the stern tube against ingress of water (3) The additional class notation **MON-SHAFT** is assigned, in accordance with NR467, Pt A, Ch 1, Sec 2, [6.6.3], to ships fitted with oil or water lubricated systems for tailshaft bearings complying with the requirements of NR467, Pt F, Ch 5, Sec 2. The assignment of this notation allows a reduced scope for complete tailshaft surveys; see NR467, Pt A, Ch 2, Sec 2, [5.5] (4) Sealing glands are to be provided with an oil leak prevention air seal or the stern tube oil is to be of a non-toxic and biodegradable quality approved in accordance with recognized standards. Refer to NR467, Pt F, Ch 9, Sec 2, [2], Design requirements for the additional class notation **CLEANSHIP** (Stern tube leakage) (5) As per conditions set in the TA
G41	Hydraulic motors, hydraulic pumps (1)	DA (2)	C / W (2)	X h	C / W (3)	(1) Within piping systems covered by NR467, Part C, Chapter 1, when belonging to class I, II or III piping systems (2) Same considerations as for Pumps. See item **G31** (material certificates according to the piping class) (3) Product certificate W for hydraulic pumps or hydraulic motors belonging to other class III piping systems

AUXILIARY MACHINERY - ITEM G						
No.	Item	Product certification				Remarks
		Design assessment / Approval	Raw material certificate	Examination and testing	Product certificate	
G42	Hydraulic systems, Hydraulic power installations - All hydraulic power installations intended for "essential services", as defined in Section 1 of this NR266 and in NR467, Pt C, Ch 2, Sec 1, and - Hydraulic power installations not serving "essential services" but located in spaces where sources of ignition are present	DA (1) (2)		X	C	(1) See provisions of NR467, Pt C, Ch 1, Sec 10, [14] (2) Hydraulic power installations with a design pressure of less than 2,5 MPa and hydraulic power packs of less than 5 kW will be given special consideration. Hydraulic power installations with a design pressure exceeding 35 MPa will be given special consideration (3) Specific requirements for Steering gears systems. See item **B1** (type tests as per NR467) (4) For pump housing, material certificates (C / W) according to the piping class. See item **G31** (5) For electrical motors, refer to item **K5**; for other electrical systems, refer to relevant provisions of this NR266 and of NR467 (6) See item **G28** (7) For piping, valves and fittings: material certificates (C or W) according to the piping class and the nominal diameter ND. See items **G26** and **G27** (8) - Material certificate C for class 1 pressure vessels. See item **G30** - Material certificate W for class 2 or 3 pressure vessels. See item **G30** Note: Hydraulic systems and hydraulic power installations for handling 'Side scuttles and windows, Shell doors, Hatch covers, Watertight doors, External ramp, Movable deck and inner ramp'. See item **B17**
	1- Pumps (hydraulic pumps)	(3)	C / W (4)	X h	C	
	2- Electrical motors (5)	(5)		X	C / W	
	3- Flexible hose assembly (6)	TA	W	X h	C	
	4- Piping, valves and fittings (7)		C / W (7)	X h ndt	C	
	5- Hydraulic jacks, hydraulic cylinders and accumulators	DA	C / W (8)	X h ndt	C	
G43	Automatic closing devices (air pipe)	TA (HBV)			W	
G44	Ballast water management system (BWMS)				(1)	(1) Also see relevant provisions of **S7** (Statutory) (2) As per conditions set in the TA (3) Classified as Class III pressure vessel, also see item **G30**
	1- Ballast water management system	TA		X (2)	C	
	2- Filters (3)		W	X h ndt	C	

AUXILIARY MACHINERY - ITEM G						
No.	Item	Product certification				Remarks
		Design assessment / Approval	Raw material certificate	Examination and testing	Product certificate	
G45	Wind Propulsion Systems (1)					(1) Ships fitted with a wind propulsion system may be assigned the additional class notations WPS1 (for wind propulsion system including standing part) or WPS2 (for wind propulsion system including standing and running part), as per Rule Note NR206 (2) Approval as per NR216 and NR480, as applicable (3) See raw material certification (4) Type approval as per NR216 (5) see provisions of NR546 (6) Representative samples of the composite construction is to be tested and qualified as per agreed program; relevant tests to be carried out by a testing laboratory accepted by the Society (7) Document type according to the agreed survey scheme - as per conditions set in the DA (8) Checking of fitting on board (9) Approval as per NR206 (10) The extent and the nature of the non-destructive examinations are subject to the Society's agreement. (11) According to type of materials (12) Proof load as per NR206 (13) For special bolts (i.e. expansion type), product certificate C is required
	1- Steel and aluminum (Raw materials)					
	- Steel plates, profiles, bars for mast structure	(2)	C (2)		(3)	
	- Aluminum alloy plates, profiles, bars for mast structure	(2)	C (2)		(3)	
	- Filler products for welding (welding consumables)	TA (4)			W	
	- Aluminum alloy rivets for mast structure	(2)	C (2)		(3)	
	- Transition joints steel / aluminum alloy	TA (2)	C		C	
	- Steel castings/forgings	(2)	C (2)	X ndt	(3)	
	- Aluminum alloy castings	(2)	C (2)	X ndt	(3)	
	2- Laminate composite materials (Raw materials: Composite)	DA (5)		X (6)	C / W (7)	
	- Adhesives assembly	TA HBV		X (6)	W	
	- Reinforcement fibres	TA HBV			W	
	- Resin systems	TA HBV			W	
	- Core materials for sandwiches	TA HBV			W	
	- Adhesives	TA HBV			W	
	- Prepreg	TA HBV			W	
	3- Standing rigging (8)					
	- Mast	DA /TA (9)	(9)	X (10)	C	
	- Shrouds intended for standing rigging (Steel and fiber ropes and Terminal accessories)	DA (9)	W	X (11)	C	
	- Deck eyeplates, chain plate for standing rigging	DA (9)	(9)	X (11) (12)	C	
	- Coupling bolts	DA (9)	W	X	C / W (13)	
	- Bearings	DA	W	X (11)	W	

AUXILIARY MACHINERY - ITEM G						
No.	Item	Product certification				Remarks
		Design assessment / Approval	Raw material certificate	Examination and testing	Product certificate	
	4- Running rigging					(14) Breaking test on specimen as per NR206
	- Shrouds intended for running rigging (Steel and fiber ropes and Terminal accessories)	DA (9)	W	X (14)	W	(15 For welded construction. The extent and the nature of the non-destructive examinations are subject to the Society's agreement
	- Deck eyeplates, chain plate for running rigging	DA (9)	W	X (12) (15)	W	(16) Tests as per NR206
	- Clutch, shackle, sheaves and other running rigging accessories	DA (9)	W	X (12) (15)	W	(17) Material as per NR216
	- Winches and their accessories for running rigging	DA (9)	W	X (16)	W	(18) For welded construction. The extent and the nature of the non-destructive examinations are subject to the Society's agreement
	- Slewing ring	DA	C	X ndt	C	(19 Running test as per agreed program
	5- Drive unit - Mechanical system					(20) Electrical motors and equipment to be considered as intended 'for essential services'. Survey requirements as per item **K**
	- Reduction gears with transmitted power ≥ 110 kW	DA / TA	W / C	X h ndt	C	(21) As per Society's agreement.
	- Reduction gears with transmitted power < 110 kW	DA / TA	W		W	(22) Diesel engines to be type approved as marine engines. Survey requirements as per NR266 item E1 and applicable provisions of NR467, Pt C, Ch 1, Sec 2
G45	- Winches for rotating and release systems	DA (9)	(17)	X (18) (19)	C	(23) Material certificate of small pumps or valve required depending on the type of wind propulsion system.
	- Hydraulic systems and other component essential for the function of the winch		C	X	C	
	- Motors and electrical equipment essential for the function of the winch (20)			X	C	
	- Auxiliary machinery items essential for the function of the wind propulsion system	(21) (22)				
	- Hydraulic accumulator	DA / TA	W / C	X h ndt	W / C	
	- Hydraulic cylinders class I	DA / TA	C	X h ndt	C	
	- Hydraulic motors / pumps belonging to class I and II	DA / TA	W	X h ndt	C	
	- Hydraulic motors / pumps belonging to class III			X h	W	
	- Flexible hoses	TA	W	X h	C	
	- Piping system and fittings		W / C (23)	X h ndt	W / C	

AUXILIARY MACHINERY - ITEM G						
No.	Item	Product certification				Remarks
		Design assessment / Approval	Raw material certificate	Examination and testing	Product certificate	
G45	6- Drive unit - Electrical system					
	- Electric motors for essential functions of the wind propulsion system (1)	DA / TA		X	C / W	
	- Cables, Circuit breakers, Contactors	DA / TA			W	
	- Convertors	DA / TA			C	
	- Switchboard	DA		X	C	
	- Other electrical equipment (1)	DA	(20)	(20)	(20)	
G46	Overridable power limitation systems (EPL and ShaPoLi)	TA (HBV) (1)			W	(1) TA Only. As per NR467, Pt C, Ch 1, Sec 2, [2.7.7]
G47	Carbon capture and storage system covered by additional service feature OCC	TA / DA	C / W	X h ndt	C	(1) As required in other relevant NR266 tables. (2) As required by NR467, Pt C, Ch 1, Sec 12, Tab 3
	1- Solvent system	TA	C / W (1)	X h ndt (2)	C	
	2- Exhaust gas and separation system	DA	C / W (1)	X h ndt (2)	C	
	3- CO2 system	TA	C / W (1)	X h ndt (2)	C	

Item H - Cargo Handling and Containment Systems of Liquefied Gas Carriers

CARGO HANDLING AND CONTAINMENT SYSTEMS OF LIQUEFIED GAS CARRIERS - ITEM H						
No.	Item	Product certification				Remarks
		Design assessment / Approval	Raw material certificate	Examination and testing	Product certificate	
H1	Steel plates and profiles for independent cargo tanks	(1)	C (1)	X	C	(1) As per provisions of NR467, Part D, Chapter 9
H2	Aluminium alloy plates and profiles for independent cargo tanks	(1)	C (1)	X	C	(1) As per provisions of NR467, Part D, Chapter 9
H3	Stainless or high alloy steel for membrane cargo containment system	(1)	C (1)	X	C	(1) As per provisions of NR467, Part D, Chapter 9
H4	Independent cargo tank supporting materials	TA (1)	C (1)	X	C	(1) As per provisions of NR467, Part D, Chapter 9 and relevant provisions of NR216 and NR480 Note: Contacts of cargo tanks to supporting blocks to be checked on board
H5	Insulation materials					(1) Test to be witnessed by attending surveyors unless otherwise agreed (2) DA for glue not used in secondary barrier (SB) or inner space (IP) bonding (3) Tensile tests for TA (4) C for Polyurethane Foam, W for Polystyrene (5) Review of bonders operators qualifications Review of bonding and other fabrication or testing qualifications including Flat, Corner and Tri-way panels (6) In the case of shipbuilder's own manufacturing, no certificate would be issued after inspection unless explicitly required
	1 - Paint for inner hull protection	TA			W	
	2 - Studs, nuts, washers, coupler sockets, staples and screws		W		W	
	3 - Load bearing mastic	TA (1)		X	W	
	4 - Adhesives and Glue	TA (2) (3)			W	
	5 - Foam panel	TA			C/W (4)	
	6 - Plywood	TA			W	
	7 - Stainless steel sheet	TA		X	C	
	8 - Stainless steel sheet studs, nuts and washers	DA			C	
	9 - Glass wool and Glass cloth	TA			W	
	10 - Thermal protection				W	
	11 - Aluminium for reinforced elements	TA		X	C	
	12 - Aluminium wedges	TA	C		W	
	13 -Secondary Barrier (composite material)	TA		X	C	
	14 - Insulating Panels	TA	C	X (5)	C	

CARGO HANDLING AND CONTAINMENT SYSTEMS OF LIQUEFIED GAS CARRIERS - ITEM H						
No.	Item	Product certification				Remarks
		Design assessment / Approval	Raw material certificate	Examination and testing	Product certificate	
	15 - Expansion Rivets (15 mm)	TA	W		W	
	16 - Stainless Steel corners and Anchor Strips	TA	C	X	C	
	17 - Primary barrier component	DA	C	X	C	
	18 - Single Legs	DA	W	X	C	
	19 -Primary Block Assembly	DA	W		C	
	20 - Perlite	TA			W	
H5	21 - Insulating Material Flexible / Rigid	TA			W	
	22 - Fe-Ni alloy (36% Nickel) strips	TA		X	C	
	23 - Anti-sticking film				W	
	24 - Insulating Boxes	DA	W		W	
	25 - Fe-Ni (36% Nickel) welding filler metal	TA		X	C	
	26 - Densified wood laminated for pipe guide tower	DA	C		C (6)	
	Cargo gas compressors and their prime movers					(1) As per provisions of NR467, Part D, Chapter 9 (2) Cryogenic pumps and compressors – Product certificate (C) required for materials in contact with the cargo: both the pressure containing parts, and non-pressure containing components (shaft and impellers) (3) According to an agreed program (4) For electrical motors, refer to item **K**; for other prime movers (i.e. steam, hydraulic systems), refer to relevant provisions of this NR266 and of NR467
H6	1- Cargo gas compressors	TA or DA (1)	C (1) (2)	X h (3)	C	
	2- Prime movers (4)	(4)	(4)	X (4)	C	

CARGO HANDLING AND CONTAINMENT SYSTEMS OF LIQUEFIED GAS CARRIERS - ITEM H						
No.	Item	Product certification				Remarks
		Design assessment / Approval	Raw material certificate	Examination and testing	Product certificate	
H7	Cargo pumps and their prime movers					(1) As per provisions of NR467, Part D, Chapter 9 (2) Cryogenic pumps and compressors – Product certificate (C) required for materials in contact with the cargo: both the pressure containing parts, and non-pressure containing components (shaft and impellers) (3) According to an agreed program (4) For electrical motors, refer to item **K**; for other prime movers (i.e. steam, hydraulic systems), refer to relevant provisions of this NR266 and of NR467
	1- Cargo pumps	TA or DA (1)	C (1) (2)	X h (3)	C	
	2- Prime movers (4)	(4)	(4)	X (4)	C	
H8	Bulkhead seal and Gastight shaft bulkhead penetration devices	DA or TA (1)		X h	C (2)	(1) As per NR467, Pt D, Ch 9, Sec 3 (2) As per conditions set in the TA
H9	Fans for enclosed spaces located within the cargo area, and their prime movers					(1) Concerns the anti sparking fans (2) As per conditions set in the TA (3) For electrical motors, refer to item **K**; for other prime movers (i.e. steam, hydraulic systems), refer to relevant provisions of this NR266 and of NR467
	1- Fans	TA (1)		X	C / W (2)	
	2- Prime movers (3)	(3)		X (3)	C	
H10	Condensers, gasifiers or vaporizers, separators, heat exchangers, receivers, or other similar apparatus of cargo reliquefaction plant	DA (1)	C	X h ndt	C	(1) As per provisions of NR467, Part D, Chapter 9. Process pressure vessels handling cargo are to be considered as class 1 pressure vessels, in accordance with NR467, Pt C, Ch 1, Sec 3, [1.4.1] Note: Running tests - during gas trials of the ship
H11	Seamless steel or stainless steel cargo pipes of class I, for liquefied gas carriers (1)					(1) As per provisions of NR467, Part D, Chapter 9. Cargo and process piping have to comply with the applicable requirements of NR467, Pt C, Ch 1, Sec 10 for class I pressure piping, unless otherwise specified in IGC Code or in NR467, Part D
	• nominal diameter ND ≥ 50mm		C	X h ndt	C	
	• nominal diameter ND < 50mm		W	X h ndt	W	
H12	Longitudinally welded stainless steel cargo pipes of class I, for liquefied gas carriers (1)					(1) As per provisions of NR467, Part D, Chapter 9. Cargo and process piping have to comply with the applicable requirements of NR467, Pt C, Ch 1, Sec 10 for class I pressure piping, unless otherwise specified in IGC Code or in NR467, Part D
	• nominal diameter ND ≥ 50mm		C	X h ndt	C	
	• nominal diameter ND < 50mm		W	X h ndt	C	

CARGO HANDLING AND CONTAINMENT SYSTEMS OF LIQUEFIED GAS CARRIERS - ITEM H						
No.	Item	Product certification				Remarks
		Design assessment / Approval	Raw material certificate	Examination and testing	Product certificate	
H13	Cargo pipe fittings (1)	DA (2)	C / W (3)	X h ndt (4)	C	(1) Such as elbows, reducers, flanges: same remarks as for items **H11** or **H12**, as appropriate (2) If not already addressed within the scope of the system approval (3) Material certificate C for fittings of nominal diameter ND ≥ 50 mm; work's certificate W for ND < 50 mm (4) When the fittings are of welded type, the welding procedures are to be examined
H14	Expansion joints (1)	TA	C (2)	X h ndt	C	(1) Specific requirements as per NR467, Part D, Chapter 9 (2) Cargo piping and process piping have to comply with the applicable requirements of NR467, Pt C, Ch 1, Sec 10 for class I pressure piping, unless otherwise specified in IGC Code or in NR467, Part D
H15	Expansion bellows (1)	TA (2)	C (3)	X h ndt	C	(1) Specific requirements as per NR467, Part D, Chapter 9 (2) Prototype tests to be performed on each type of expansion bellows intended for use on cargo piping, primarily on those used outside the cargo tank (3) Cargo piping and process piping have to comply with the applicable requirements of NR467, Pt C, Ch 1, Sec 10 for class I pressure piping, unless otherwise specified in IGC Code or in NR467, Part D
H16	Cargo hoses (1)	TA	C (2)	X h ndt (3)	C	(1) Specific requirements as per NR467, Part D, Chapter 9 (2) Cargo piping and process piping have to comply with the applicable requirements of NR467, Pt C, Ch 1, Sec 10 for class I pressure piping, unless otherwise specified in IGC Code or in NR467, Part D (3) Unit production testing: each produced length of cargo hose complete with end-fittings is to be hydrostatically tested as per NR467, Pt D, Ch 9, Sec 5

CARGO HANDLING AND CONTAINMENT SYSTEMS OF LIQUEFIED GAS CARRIERS - ITEM H						
No.	Item	Product certification				Remarks
		Design assessment / Approval	Raw material certificate	Examination and testing	Product certificate	
H17	Cargo valves (1)					(1) As per provisions of NR467, Part D, Chapter 9. Cargo piping and process piping have to comply with the applicable requirements of NR467, Pt C, Ch 1, Sec 10 for class I pressure piping, unless otherwise specified in IGC Code or in NR467, Part D (2) Index TA for service temperature < –55°C index DA for service temperature ≥ – 55°C (3) Prototype testing as per NR467, Pt D, Ch 9, Sec 5 (4) As per NR216, Ch 5, Sec 7, [1.8]. Non-destructive examination by both MPI and UT methods are to be carried out on all Class 1 drum-forgings having thickness > 10 mm, intended for Class I piping systems, typically: all valves of large size (having nominal diameter ≥ 24") (5) In case of welded construction. When the valves have welded elements, the welding procedures are to be examined (6) Unit production testing: all valves are to be tested as per NR467, Pt D, Ch 9, Sec 5
	• nominal diameter ND ≥ 50mm	TA or DA (2) (3)	C (4)	X h ndt (5) (6)	C	
	• nominal diameter ND < 50mm	TA or DA (2) (3)	W (4)	X h ndt (5) (6)	C	
H18	Safety relief valves for cargo process piping system	TA or DA (1)	C	X ndt (2) (3)	C	(1) TA, or case-by-case DA (2) Checking of the setting (3) When the valves have welded elements, the welding procedures are to be examined
H19	Safety relief valves for cargo tanks	TA (1)	C	X ndt (2) (3)	C	(1) The approval includes capacity testing (2) Checking of the setting including tightness test (3) When the valves have welded elements, the welding procedures are to be examined
H20	Cargo process and containment instrumentation	TA (1)	C	X	C	(1) For some equipment, DA is applicable on a case-by-case basis; see item **K** and relevant provisions of NR467, Part D, Chapter 9
H21	Vent lines on cargo tanks (1) (2)	DA	C / W (3)	X h ndt (2)	C	(1) Open-ended lines (the design pressure should be not less than 5 bar gauge) (2) In case of welded construction. When the vent lines have welded elements, the welding procedures are to be examined (3) Material certificate W for vent head where fitted and meeting the pressure vessel criteria for class 3; see item **G30**
H22	Inert gas generation systems (1)					(1) See item **D**

CARGO HANDLING AND CONTAINMENT SYSTEMS OF LIQUEFIED GAS CARRIERS - ITEM H						
No.	Item	Product certification				Remarks
		Design assessment / Approval	Raw material certificate	Examination and testing	Product certificate	
H23	Fire prevention materials and arrangements (1)					(1) See item **C**
H24	Fire fighting systems (1)					(1) See item **C**
H25	Gas detection system	TA (1)		X	C	(1) Automation systems: see relevant provisions of item **N**
H26	Boil-Off Gas (BOG) Handling system (1) Boil-Off Gas (BOG) Handling system, as part of Refrigeration / Reliquefaction systems (2)	TA (3)		X (4)	C	(1) See relevant provisions of NR467, Pt D, Ch 9, Sec 7, [2]. Also see item **L27** (2) In case a component, material or equipment is not listed, refer to the applicable survey requirement of relevant item of this NR266 (3) TA, or DA (on a case-by-case basis) (4) As per agreed program, based on the requirements of IGC Code and/or standards recognized by the Society (5) Heat exchangers (Class 1 vessel) (6) Automation systems: see relevant provisions of items **K** and **N** (7) As per conditions set in the TA Note: On board tests of regasification plant after installation, as per agreed program. Onboard tests are intended to demonstrate that the plant with associated safety features is functioning properly in compliance with the Rules criteria. The tests are to be witnessed by a Surveyor
	1- Compressor	TA or DA	C	X h ndt	C	
	2- Turbine	TA or DA	C / W	X h ndt	C	
	3- Electric motor	TA or DA	C / W	X	C	
	4- Heat exchangers, Coolers, Sub-coolers	DA	C (5)	X h ndt	C	
	5- Sensors, transmitters, flow meters, PT100 and PLC, Circuit breakers, Electric Cables	TA (6)		X	C / W (7)	
	6- Cryogenic piping systems, cryogenic valves, cryogenic flexible hoses assembly	TA or DA	C	X h ndt	C	
	7- Other piping systems, valves, flexible hoses assembly and expansion bellows	TA or DA	C / W	X h ndt	C	

CARGO HANDLING AND CONTAINMENT SYSTEMS OF LIQUEFIED GAS CARRIERS - ITEM H						
No.	Item	Product certification				Remarks
		Design assessment / Approval	Raw material certificate	Examination and testing	Product certificate	
H27	Regasification components for FSRUs and FSUs: (1) (2) (3) (4) (5) • Floating Storage Regasification Units (FSRUs) defined as floating units fitted with equipment for storage and regasification of liquefied natural gas (LNG) • Floating Storage Units (FSUs) defined as floating units fitted with equipment for storage of liquefied natural gas (LNG)					(1) As per NR645 Classification of Floating Storage Regasification Units and Floating Storage Units (2) Boil-Off Gas (BOG) Handling system - See item **H26** (3) The requirements are only applicable for steel units having one of the structural type notations and service notations defined in NR645. (4) As reference only, a list of recognized regulations and standards relevant for regasification plant and components is given in NR645, Sec 10, Tab 4. (5) Regasification components survey and certification - as per provisions of NR645, Sec 10, Tab 3. In case a component, material or equipment is not listed, refer to the applicable survey requirement of relevant item of this NR266 (6) As per conditions set in the TA (7) Automation systems: see relevant provisions of items **K** and **N** Note: On board tests of regasification plant after installation, as per agreed program. Onboard tests are intended to demonstrate that the plant with associated safety features is functioning properly in compliance with the Rules criteria. The tests are to be witnessed by a Surveyor.
	1 - Steel plates, profiles, bars and pipes for main structure		C		C	
	2 - Pipes and fittings		C	X	C	
	3 - Expansion joints	TA	C	X h	C	
	4 - Flexible and loading/offloading hoses	TA	C	X	C	
	5 - Safety valves	TA	C	X	C	
	6 - Cryogenic and Gas valves	DA	C	X	C	
	7 - LP Transfer and HP send out pumps	DA	C	X	C	
	8 - Heat exchanges, vaporizers	DA	C	X	C	
	9 - Pressure vessels, suction drum	DA	C	X	C	
	10 - Compressors	DA	C	X	C	
	11 - Fire passive system and materials	TA			C/W (6)	
	12 - Fire active system	TA/DA	C/W	X	C	
	13 - Gas detection system	TA		X	C	
	14 - Cryogenic protection material	TA/DA		X	C	
	15 - Electro motors	TA/DA	C/W	X	C	
	16 - Automation systems	TA		X	C/W (6)	
	17 - Sensors, transmitters, flow meters, circuit breaker, electrical cable	TA (7)		X	C/W (6)	
	18 - Heating media pump	TA/DA	W	X	C	
	19a - Heating media pipes and fittings, of Class I and II		C	X	C	

CARGO HANDLING AND CONTAINMENT SYSTEMS OF LIQUEFIED GAS CARRIERS - ITEM H						
No.	Item	Product certification				Remarks
		Design assessment / Approval	Raw material certificate	Examination and testing	Product certificate	
	19b - Heating media pipes and fittings, of Class III		W	X	W	
	20 - Insulation material	TA		X	C/W (6)	
H27	21 - Gas metering / analyzer skid	DA	C	X	C	
	22 - Boiler with associated components	TA/DA	C	X	C	
H28	Glycol water heater (Electric or Steam), Cofferdam heating system (1)	TA / DA	(1) (2)	X (1) (2)	(1) (2)	(1) As per NR467 Pt D, Ch 9, Sec 4 (IGC Code) (2) Also see relevant provisions of items **L26** and **L27** for associated components
H29	Pump tower (cargo piping and supporting structure)	DA	W/C (1)	X h (2) ndt (3)	C (2)	(1) C for cargo piping, W for supporting structure (2) For cargo piping, See H11 to H15 (3) Review of welders, and NDT operators qualifications. Review of welding, NDT and other fabrication or testing qualifications. Survey of the fabrication and witnessing of NDT at random.
H30	Pump Tower Base Support	DA	C	X ndt (1)	C	(1) Review of welders, and NDT operators qualifications. Review of welding, NDT and other fabrication or testing qualifications (in particular - gas tracer/leak test). Survey of the fabrication and witnessing of NDT at random.
H31	Dome Cover	DA	C	X ndt (1) (2)	C (2)	(1) Review of welders, and NDT operators qualifications. Review of welding, NDT and other fabrication or testing qualifications. Survey of the fabrication and witnessing of NDT at random. (2) For cargo piping, See H11 to H15.
H32	Dome Seat	DA	C	X ndt (1)	C	(1) Review of welders, and NDT operators qualifications. Review of welding, NDT and other fabrication or testing qualifications. Survey of the fabrication and witnessing of NDT at random.
H33	Sump well	DA	C	X ndt (1)	C	(1) Review of welders, and NDT operators qualifications. Review of welding, NDT and other fabrication or testing qualifications (in particular - gas tracer/leak test). Survey of the fabrication and witnessing of NDT at random.
H34	Independent cargo tank systems	DA (1)	C / W (1)	X ndt	C	(1) As per provisions of NR467, IGC Code and IGF Code.

Item I - Cargo Handling and Containment Systems of Oil / FLS Tankers or Chemical Tankers

CARGO HANDLING AND CONTAINMENT SYSTEMS OF OIL / FLS TANKERS OR CHEMICAL TANKERS - ITEM I						
No.	Item	Product certification				Remarks
		Design assessment / Approval	Raw material certificate	Examination and testing	Product certificate	
I1	Steel or stainless steel plates and profiles for cargo tanks		C (1)			(1) As per relevant provisions of NR467, Part D, Chapter 7 and NR467, Part D, Chapter 8 and applicable requirements of NR216
I2	Coating systems of cargo tanks	(1) (2)	W (1) (2)	X (1) (2)	W (1) (2)	(1) Also see item B23 (Corrosion protective coatings) (2) As per relevant provisions of NR467, Part D, Chapter 7 and NR467, Part D, Chapter 8
I3	Cargo pumps and their prime movers					(1) As per provisions of NR467, Part D, Chapter 7 and NR467, Part D, Chapter 8 (2) Cargo pumps (material certificate C or W): • C: for Cast body • W: for Welded construction (3) According to an agreed program (4) For electrical motors, refer to item **K**; for other prime movers (i.e. steam, hydraulic systems), refer to relevant provisions of this NR266 and of NR467
	1- Cargo pumps	DA or TA (1)	C / W (2)	X h (3)	C	
	2- Prime movers	(4)	(4)	X (4)	C / W (4)	
I4	Bulkhead seal and Gastight shaft bulkhead penetration devices	DA or TA (1)		X h	C (2)	(1) As per NR467, Pt D, Ch 7, Sec 4 (2) As per conditions set in the TA
I5	Fans for enclosed spaces located within the cargo area, and their prime movers					(1) Concerns the anti sparking fans (2) As per conditions set in the TA (3) For electrical motors, refer to item **K**; for other prime movers (i.e. steam, hydraulic systems), refer to relevant provisions of this NR266 and of NR467
	1- Fans	TA (1)		X	C / W (2)	
	2- Prime movers (3)	(3)		X (3)	C / W (3)	
I6	Seamless steel or stainless steel cargo pipes of class I, for chemical tankers (1) (2)					(1) As per NR467, Pt D, Ch 8, Sec 5, cargo pipes and associated accessories are considered as: • class I: when the design pressure is above 1,5 MPa, or the pipe is intended for toxic substances • class II: when the design pressure is equal to or less than 1,5 MPa, or • class III: when they are open ended or placed inside cargo tanks (2) The provisions given in NR467, Part D, Chapter 8, related to cargo piping, supplement those given in NR467, Pt C, Ch 1, Sec 10, [20] for piping systems
	• nominal diameter ND ≥ 25mm		C	X h ndt	C	
	• nominal diameter ND < 25mm		W	X h ndt	C	

CARGO HANDLING AND CONTAINMENT SYSTEMS OF OIL / FLS TANKERS OR CHEMICAL TANKERS - ITEM I						
No.	Item	Product certification				Remarks
		Design assessment / Approval	Raw material certificate	Examination and testing	Product certificate	
I7	Cargo pipes of class II, for chemical tankers (1) (2)					(1) As per NR467, Pt D, Ch 8, Sec 5, cargo pipes and associated accessories are considered as: • class I, when the design pressure is above 1,5 MPa, or the pipe is intended for toxic substances • class II, when the design pressure is equal to or less than 1,5 MPa, or • class III, when they are open ended or placed inside cargo tanks (2) The provisions given in NR467, Part D, Chapter 8, related to cargo piping, supplement those given in NR467, Pt C, Ch 1, Sec 10, [20] for piping systems
	• nominal diameter ND ≥ 100mm		C	X h ndt	C	
	• nominal diameter ND < 100mm		W	X h ndt	C	
I8	Cargo pipes of class II for oil / FLS tankers (1)					(1) As per NR467, Pt D, Ch 7, Sec 4, unless otherwise specified, cargo piping is to be designed and constructed according to the requirements of NR467, Pt C, Ch 1, Sec 10 applicable to piping systems of: • class III, in the case of ships having the service notation **oil tanker** • class II, in the case of ships having the service notation **FLS tanker**, with the exception of cargo pipes and accessories having an open end or situated inside cargo tanks, for which class III may be accepted
	• nominal diameter ND ≥ 100mm		C	X h ndt	C	
	• nominal diameter ND < 100mm		W	X h ndt	C	
I9	Cargo pipes and accessories of class III (1)			X h	W	(1) Class III: as defined in NR467, Part D, Chapter 7 and NR467, Part D, Chapter 8 (see items **I6**, **I7** and **I8**)
I10	Cargo pipe fittings (1)	DA (2)	C / W (3)	X h ndt (4)	C	(1) Such as elbows, reducers, flanges: same remarks as for items **I6**, **I7** or **I8**, as appropriate (2) If not already addressed within the scope of the system approval (3) - Fittings of class I: material certificate C for ND ≥ 25mm, W for ND < 25 mm - Fittings of class II: material certificate C for ND ≥ 100 mm, W for ND < 100 mm For the definition of class I/class II, refer to relevant provisions of items **I6**, **I7** (chemical tankers) and **I8** (oil/FLS tankers) (4) When the fittings are of welded type, welding procedures are to be examined
I11	Expansion joints (1)	TA	W	X h ndt	C	(1) Specific requirements as per NR467, Part D, Chapter 7 and NR467, Part D, Chapter 8
I12	Expansion bellows (1)	TA	W	X h ndt	C	(1) Specific requirements as per NR467, Part D, Chapter 7 and NR467, Part D, Chapter 8

CARGO HANDLING AND CONTAINMENT SYSTEMS OF OIL / FLS TANKERS OR CHEMICAL TANKERS - ITEM I						
No.	Item	Product certification				Remarks
		Design assessment / Approval	Raw material certificate	Examination and testing	Product certificate	
I13	Cargo hoses (1)	TA	W	X h ndt	C	(1) Specific requirements as per NR467, Part D, Chapter 7 and NR467, Part D, Chapter Ch 8
I14	Cargo valves (1) (2)					(1) As per NR467, Part D, Chapter 7 and NR467, Part D, Chapter 8 (2) For definition of class I/class II, refer to relevant provisions of items **I6**, **I7** (chemical tankers) and **I8** (oil/FLS tankers) (3) As per NR216, Ch 5, Sec 7, [1.8]. Non-destructive examination by both MPI and UT methods are to be carried out on all Class 1 drum-forgings having thickness > 10 mm, intended for Class I piping systems, typically: all valves of large size (having nominal diameter ≥ 24") (4) Chemical tankers: • material as per NR216, Ch 5, Sec 7, [1.8] • for castings, corrosion tests ASTM A262 Practice E (copper-copper sulphate sulphuric) or Practice C (nitric acid), as appropriate, may be required to be carried out on 1 piece per batch; tests in accordance with other recognised standards are subject to agreement by the Society (5) In case of welded construction; when the valves have welded elements, the welding procedures are to be examined
	• valves of class I: nominal diameter ND ≥ 25 mm • valves of class II: nominal diameter ND ≥ 100 mm	DA or TA	C (3) (4)	X h ndt (5)	C	
	• valves of class I: nominal diameter ND < 25 mm • valves of class II: nominal diameter ND < 100 mm	DA or TA	W (3) (4)	X h ndt (5)	C	
I15	Plastic pipes used as cargo pipes	TA (1) (2)	C	X h (3)	C	(1) As per NR467, Pt D, Ch 7, Sec 4: plastic pipes may be used in the conditions specified in NR467, Pt C, Ch 1, App 3. Arrangements are to be made to avoid the generation of static electricity (2) See item **G26** (3) As per agreed program
I16	Safety relief valves for cargo process piping system	TA or DA (1)	C	X ndt (2)	C	(1) TA, or case-by-case DA (2) When the valves have welded elements, the welding procedures are to be examined Note: Running tests - checking of the setting
I17	Pressure / vacuum safety relief valves for cargo tanks	TA (1)	W	X ndt (2)	C	(1) As per provisions of NR467, Part D, Chapter 8. The approval includes capacity testing (2) When the valves have welded elements, the welding procedures are to be examined Note: Running tests - checking of the setting including tightness test

CARGO HANDLING AND CONTAINMENT SYSTEMS OF OIL / FLS TANKERS OR CHEMICAL TANKERS - ITEM I						
No.	Item	Product certification				Remarks
		Design assessment / Approval	Raw material certificate	Examination and testing	Product certificate	
I18	Flame arresting devices	TA (1)		X	C	(1) As per relevant provisions of NR467 Pt D, Ch 7, App 1
I19	Cargo process and containment instrumentation	TA (1) (2)	C	X	C	(1) For some equipment, DA is applicable on a case-by-case basis; see item **K** and relevant provisions of NR467, Part D, Chapter 7 and NR467, Part D, Chapter 8 (2) Automation systems: see relevant provisions of item **N**
I20	Inert gas generation systems (1)					(1) See item **D**
I21	Fire prevention materials and arrangements (1)					(1) See item **C**
I22	Fire fighting systems (1)					(1) See item **C**
I23	Gas detection system	TA (1)		X	C	(1) Automation systems: see relevant provisions of item **N**
I24	Tank washing machines, COW systems (1)	TA (1)		X	C	(1) When required, for oil/FLS tankers. Every crude oil tanker of 20 000 tons deadweight and above is to be fitted with a cargo tank cleaning system using crude oil washing and complying with NR467, Pt D, Ch 7, App 2
I25	Tank washing machines, COW systems (1)	DA or TA (1)		X	W	(1) Crude oil washing systems fitted on oil tankers other than crude oil tankers of 20 000 tons deadweight or above are to comply with the provisions of NR467, Pt D, Ch 7, App 2 related to safety
I26	Oil discharge monitoring and control system (1)	TA (2) (3)		X	C	(1) For oil / FLS tankers (2) As per NR467, Part D, Chapter 7 (3) Automation systems: see relevant provisions of item **N**
I27	Oil-water interface detectors (1)	TA (2) (3)		X	C	(1) For oil / FLS tankers (2) As per NR467, Part D, Chapter 7 (3) Automation systems: see relevant provisions of item **N**

Item J - Fire Fighting Ships

FIRE FIGHTING SHIPS - ITEM J						
No.	Item	Product certification				Remarks
		Design assessment / Approval	Raw material certificate	Examination and testing	Product certificate	
J1	Fire pumps and their prime movers	DA		X (1)	C	(1) Performance test for bilge and fire pumps according to NR467, Pt C, Ch 1, Sec 10, [20.6.1]. See item **G31** (2) For electrical motors, refer to item **K**; for other prime movers (i.e. steam, hydraulic systems), refer to relevant provisions of this NR266 and of NR467. Diesel engines as per item **E1**
	1- Fire pumps		W	X h ndt	C	
	2- Prime movers	(2)	(2)	X (2)	C / W (2)	
J2	Fire water main, fire foam main, water spray piping systems and their accessories (1) (2)	DA or TA (1)		X h	C (1)	(1) Requirements according to relevant class of piping. See items **G26** and **G27** (2) Foam proportioner / inductor, Water / foam monitor, Foam applicator: see items **C38**, **C39** and **C40**
J3	Foam generation systems (1)	DA		X	C	(1) Foam proportioner / inductor, Water / foam monitor, Foam applicator: see items **C38**, **C39** and **C40**
J4	Water and foam monitors, and their seating					
	1- Water and foam monitors	TA		X	C	
	2- Seating	DA		X	C	
J5	Powder generation systems	DA		X	C	
J6	Foam concentrates	TA (HBV)			W	
J7	Water spray nozzles, dual-purpose nozzles	TA (1)			C / W (2)	(1) In the case of a discrepancy between the provisions of the applicable International and National statutory regulations and those of the Society's Rules, normally the former take precedence. A valid certification to MED 2014/90/EU (or MED96/98/EC as amended for its Annex A1 items) is to be recognised for classification purpose (2) As per conditions set in the TA

Item K - Electrical Equipment

ELECTRICAL EQUIPMENT - ITEM K						
No.	Item	Product certification				Remarks
		Design assessment / Approval	Raw material certificate	Examination and testing	Product certificate	
K	A summary list of auxiliaries considered as essential is given in Sec 1, [2.4] of this NR266. For an exhaustive definition of equipment intended for “essential services”, refer to NR467.					
K1	Generators and motors for electric propulsion (1)					(1) Considered as essential service: see Sec 1, [2.4] of this NR266 (2) See NR467, Pt C, Ch 2, Sec 4, [3] and [3.1.5] (3) Shafts are to be made of material complying with NR216, Chapter 5 or, where rolled products are allowed in place of forgings, with NR216, Chapter 3 (4) Material certificates for shafts (5) Shaft material for electric propulsion motors and for main engine driven generators where the shaft is part of the propulsion shafting is to be certified by the Society (6) Testing of electrical rotating machines (a.c. generators and electrical motors) includes type tests and routine tests as per NR467, Pt C, Ch 2, Sec 4, [3] (7) In addition, for rotating machines intended for propulsion developing a power of more than 1 MW, requirements given in NR467, Pt C, Ch 2, Sec 4, [5] apply (8) If appropriate; where welded parts are foreseen on shafts and rotors, the provisions of NR216, Chapter 12 apply (on a case-by-case basis) (9) Type tests are to be carried out on a prototype machine or on the first of a batch of machines, and routine tests carried out on the subsequent machines (10) Individual works' certificate is to be issued by the manufacturer and test report submitted to the Society (11) See NR483, Pt C, Ch 2, Sec 4, [3]
	1- For Steel Ships and Offshore Units (2)					
	• Power P ≥ 100 kW (2)	DA or TA	C (3) (4) (5)	X (6) (7) (8) (9)	C	
	• Power P < 100 kW (2)	DA or TA (HBV)	W (3) (4) (5)	X (6) (7) (8) (9)	W (10)	
	2- For Naval Ships (11)					
	• Power P ≥ 50 kW (11)	DA or TA	C (3) (4) (5)	X (6) (7) (8) (9)	C	
	• Power P < 50 kW (11)	DA or TA (HBV)	W (3) (4) (5)	X (6) (7) (8) (9)	W (10)	

ELECTRICAL EQUIPMENT - ITEM K						
No.	Item	Product certification				Remarks
		Design assessment / Approval	Raw material certificate	Examination and testing	Product certificate	
K2	Engine driven generators for the general network of the ship (1) (2)					(1) Driving auxiliaries considered as essential. See typical list in Sec 1, [2.4] of this NR266 (2) For rotating machines intended for non essential services, individual works' certificate is to be issued by the manufacturer and test report made available and submitted upon request (3) See NR467, Pt C, Ch 2, Sec 4, [3] (4) Shafts are to be made of material complying with NR216, Chapter 5 or, where rolled products are allowed in place of forgings, with NR216, Chapter 3 (5) Shaft material for electric propulsion motors and for main engine driven generators where the shaft is part of the propulsion shafting is to be certified by the Society. Shaft material for other machines is to be in accordance with recognized international or national standard (6) Testing of electrical generators includes Type tests and Routine tests as per NR467, Pt C, Ch 2, Sec 4, [3] (7) If appropriate; where welded parts are foreseen on shafts and rotors, the provisions of NR216, Chapter 12 apply (8) Type tests are to be carried out on a prototype machine or on the first of a batch of machines, and routine tests carried out on the subsequent machines (9) Individual works' certificate is to be issued by the manufacturer and test report submitted to the Society (10) See NR483, Pt C, Ch 2, Sec 4, [3].
	1- For Steel Ships and Offshore Units (3)					
	• Power P ≥ 100 kVA (3)	DA or TA	W (4) (5)	X (6) (7) (8)	C	
	• Power P < 100 kVA (3)	DA or TA (HBV)	W (4) (5)	X (6) (7) (8)	W (9)	
	2- For Naval Ships (10)					
	• Power P ≥ 50 kVA (10)	DA or TA	W (4) (5)	X (6) (7) (8)	C	
	• Power P < 50 kVA (10)	DA or TA (HBV)	W (4) (5)	X (6) (7) (8)	W (9)	

ELECTRICAL EQUIPMENT - ITEM K						
No.	Item	Product certification				Remarks
		Design assessment / Approval	Raw material certificate	Examination and testing	Product certificate	
K3	Emergency generators (1) (2)					(1) Driving auxiliaries considered as essential. See typical list in Sec 1, [2.4] of this NR266 (2) For rotating machines intended for non essential services, individual works' certificate is to be issued by the manufacturer and test report made available and submitted upon request (3) See NR467, Pt C, Ch 2, Sec 4, [3] (4) Shafts are to be made of material complying with NR216, Chapter 5 or, where rolled products are allowed in place of forgings, with NR216, Chapter 3 (5) Testing of electrical generators includes Type tests and Routine tests as per NR467, Pt C, Ch 2, Sec 4, [3] (6) If appropriate; where welded parts are foreseen on shafts and rotors, the provisions of NR216, Chapter 12 apply (7) Type tests are to be carried out on a prototype machine or on the first of a batch of machines, and routine tests carried out on the subsequent machines (8) Individual works' certificate is to be issued by the manufacturer and test report submitted to the Society (9) See NR483, Pt C, Ch 2, Sec 4, [3]
	1- For Steel Ships and Offshore Units (3)					
	• Power P ≥ 100 kW (3)	DA or TA	W (4)	X (5) (6) (7)	C	
	• Power P < 100 kW (3)	DA or TA (HBV)	W (4)	X (5) (6) (7)	W (8)	
	2- For Naval Ships (9)					
	• Power P ≥ 50 kW (9)	DA or TA	W (4)	X (5) (6) (7)	C	
	• Power P < 50 kW (9)	DA or TA (HBV)	W (4)	X (5) (6) (7)	W (8)	
K4	Ward-Leonard sets (1)	DA (2)		X (3)	C	(1) For auxiliaries considered as essential (2) To be specially considered on a case-by-case basis (3) According to an agreed program

ELECTRICAL EQUIPMENT - ITEM K						
No.	Item	Product certification				Remarks
		Design assessment / Approval	Raw material certificate	Examination and testing	Product certificate	
K5	Electric motors (1) (2)					(1) Driving auxiliaries considered as essential. See typical list in Sec 1, [2.4] of this NR266 (2) For rotating machines intended for non essential services, individual works' certificate is to be issued by the manufacturer and test report made available and submitted upon request (3) See NR467, Pt C, Ch 2, Sec 4, [3] (4) Shafts are to be made of material complying with NR216, Chapter 5 or, where rolled products are allowed in place of forgings, with NR216, Chapter 3 (5) Shaft material for electric propulsion motors and for main engine driven generators where the shaft is part of the propulsion shafting is to be certified by the Society. Shaft material for other machines is to be in accordance with recognized international or national standard (6) Testing of electrical motors includes Type tests and Routine tests as per NR467, Pt C, Ch 2, Sec 4, [3] (7) If appropriate; where welded parts are foreseen on shafts and rotors, the provisions of NR216, Chapter 12 apply (8) Type tests are to be carried out on a prototype machine or on the first of a batch of machines, and routine tests carried out on the subsequent machines (9) Individual works' certificate is to be issued by the manufacturer and test report submitted to the Society (10) See NR483, Pt C, Ch 2, Sec 4, [3]
	1- For Steel Ships and Offshore Units (3)					
	• Power P ≥ 100 kW (3)	DA or TA	W (4) (5)	X (6) (7) (8)	C	
	• Power P < 100 kW (3)	DA or TA (HBV)	W (4) (5)	X (6) (7) (8)	W (9)	
	2- For Naval Ships (10)					
	• Power P ≥ 50 kW (10)	DA or TA	W (4) (5)	X (6) (7) (8)	C	
	• Power P < 50 kW (10)	DA or TA (HBV)	W (4) (5)	X (6) (7) (8)	W (9)	
K6	Transformers intended for essential services					(1) Testing of transformers includes Type tests and Routine tests as per NR467, Pt C, Ch 2, Sec 5, [2] (2) Type tests are to be carried out on a prototype machine or on the first of a batch of machines, and routine tests carried out on the subsequent machines (3) Temperature rise test may be omitted for starting transformers
	1- Power P ≥ 100 kVA (or 60 kVA when single phase)	DA or TA		X (1) (2) (3)	C	
	2- Power P < 100 kVA (or 60 kVA when single phase)	DA or TA (HBV)		X (1) (2) (3)	W	

ELECTRICAL EQUIPMENT - ITEM K						
No.	Item	Product certification				Remarks
		Design assessment / Approval	Raw material certificate	Examination and testing	Product certificate	
K7	Semiconductor convertors or static convertors (1) (2) (3)					(1) Convertors units intended for essential services and UPS units used as alternative and/or transitional source (2) Convertors units intended for non-essential services, and UPS units not used as alternative and/or transitional source, individual works' certificate is to be issued by the manufacturer and test report made available and submitted upon request (3) Refer to relevant provisions of this NR266 and of NR467 for water cooling systems, in particular: pumps and piping system, cooling fluids, pressure vessels, flexible hoses and connections, tubing, penetrations between potential wet area (cooling system) and electrical areas. Cooling and lubricating oil systems are to comply with the requirements of NR467, Pt C, Ch 1, Sec 10 (4) Testing of semiconductor convertors or static convertors includes Type tests and Routine tests as per NR467, Pt C, Ch 2, Sec 6, [3] (5) Type tests are to be carried out on a prototype machine or on the first of a batch of machines, and routine tests carried out on the subsequent machines (6) Individual works' certificate is to be issued by the manufacturer and test report submitted to the Society
	1- Power P ≥ 50 kVA	DA or TA		X (4)	C	
	2- Power P < 50 kVA	DA or TA (HBV)		X (4) (5)	W (6)	
K8	Batteries used as emergency / or transitional source (1)	(2)		X (2) (3)	C	(1) As per NR467, Pt C, Ch 2, Sec 7 (2) For Li Ion batteries used as emergency source or transitional source or of capacity above 20kWh, requirements specified in additional notation **BATTERY SYSTEM** in NR467, Part F, Ch 14, Sec 1 apply. See also item **K26** (3) Insulation measurements are to be carried out. Note: Additionally, the autonomy is to be verified on board in accordance with the operating conditions
K9	Batteries for starting purposes (1) (2)	(3)		X (3)	C	(1) For propulsion engines, main and emergency generating sets (2) See also items **K8** and **K26** (3) Applicable requirements depending on type of batteries (conventional or non-conventional). Provisions of NI596 to be considered for "accumulator battery", as guidance only. Note: The capacity, autonomy, arrangement and starting sequence are to be verified on board in accordance with the operating conditions

ELECTRICAL EQUIPMENT - ITEM K						
No.	Item	Product certification				Remarks
		Design assessment / Approval	Raw material certificate	Examination and testing	Product certificate	
K10	Regulation and control devices starters	DA		X (1)	C / W (2)	(1) Insulation measurements are to be carried out (2) As per technology and conditions set in the DA (starters)
K11	Electromagnetic couplings (1)	DA		X (2) (3)	C	(1) Intended for propulsive or auxiliary units mentioned in items **K2** and **K3** (2) Dielectric strength test is to be carried out (3) Insulation measurements are to be carried out
K12	Switchboards for electric propulsion	DA		X (1)	C / W (2)	(1) Tests including: dielectric strength test, insulation measurements, verification of the protection index IP, clearance and creepage distances, check of wiring, etc., as per NR467, Pt C, Ch 2, Sec 8 (2) Tests of main switchboards, emergency switchboards or switchboards rated above 100 kW are to be attended by a Surveyor of the Society
K13	Main and emergency switchboards	DA		X (1)	C / W (2)	(1) Tests including: dielectric strength test, insulation measurements, verification of the protection index IP, clearance and creepage distances, check of wiring, etc, as per NR467, Pt C, Ch 2, Sec 8 (2) Tests of main switchboards, emergency switchboards or switchboards rated above 100 kW are to be attended by a Surveyor of the Society
K14	Distribution switchboards, Controlgear (1)	DA		X (2)	C / W (3)	(1) Controlgear: as per NR467, Pt C, Ch 2, Sec 8. (2) Tests including: dielectric strength test, insulation measurements, verification of the protection index IP, clearance and creepage distances, check of wiring, etc., as per NR467, Pt C, Ch 2, Sec 8 (3) Tests of main switchboards, emergency switchboards or switchboards rated above 100 kW are to be attended by a Surveyor of the Society
K15	Circuit breakers					(1) Dielectric strength test is to be carried out (2) Running test at no load (3) As per technology and conditions set in the TA Note: Running test under load (on board)
	1- Medium or high voltage	TA		X (1) (2)	C / W (3)	
	2- Low voltage	TA (HBV)			W	

ELECTRICAL EQUIPMENT - ITEM K						
No.	Item	Product certification				Remarks
		Design assessment / Approval	Raw material certificate	Examination and testing	Product certificate	
K16	Contactors					(1) Dielectric strength test is to be carried out (2) Running test at no load (3) As per technology and conditions set in the TA Note: Running test under load (on board)
	1- Medium or high voltage	TA		X (1) (2)	C / W (3)	
	2- Low voltage	TA (HBV)			W	
K17	Switches, disconnecting devices, disconnectors, fuses holders					(1) Dielectric strength test is to be carried out (2) Running test at no load (3) As per technology and conditions set in the TA Note: Running test under load (on board)
	1- Medium or high voltage	TA		X (1) (2)	C / W (3)	
	2- Low voltage	TA (HBV)			W	
K18	Fuses and fuses carriers, overcurrent protective devices	TA		X (1)	C / W (1)	(1) As per technology and conditions set in the TA
K19	Cables and insulated cabling wires (1)	TA		X (2) (3)	C / W (4)	(1) As per NR467, Pt C, Ch 2, Sec 9 (2) Type tests in accordance with the relevant IEC 60092-3 Series Publications and IEC 60332-1, IEC 60332-3 Category A and IEC 60331 where applicable (3) Routine tests including: visual examination, check of conductor cross-sectional area by measuring electrical resistance, high voltage test, insulation resistance measurement, dimensional checks (as necessary), according to the Rules (4) Product certificate - As per conditions set in the TA (IBV or HBV)
K20	Heaters, electric (1) (2)	DA		X (3) (4)	C	(1) For heating plants of liquid fuel and for water heaters P ≥ 5000 W (2) Thermal oil heater (typical) is one or more fired pressure vessels and associated piping systems in which organic liquids (thermal oils) are heated. When heated by electricity thermal oil heater is considered as an unfired pressure vessel. Also see item **G30** (Pressure vessels). (3) Dielectric strength test is to be carried out (4) Insulation measurements are to be carried out

ELECTRICAL EQUIPMENT - ITEM K						
No.	Item	Product certification				Remarks
		Design assessment / Approval	Raw material certificate	Examination and testing	Product certificate	
K21	Fixed electric radiators (1)	DA		X c (2) (3)	C	(1) For passengers ships (2) Dielectric strength test is to be carried out (3) Insulation measurements are to be carried out
K22	Lighting fittings, fluorescent lamps (1)	TA		X c (2) (3) (4)	C	(1) For passengers ships. See item **K23** for liquefied gas carriers or tankers safety fittings (2) Dielectric strength test is to be carried out (3) Insulation measurements are to be carried out (4) Tests to be carried out on 1 equipment out of 100 of each type, with a minimum of 5
K23	Safety electrical equipment	TA		X (1) (2) (3)	C	(1) Dielectric strength test is to be carried out (2) Insulation measurements are to be carried out (3) Including, for flameproof material, the hydraulic test that may be made under the responsibility of the manufacturer
K24	Battery chargers (1) (2)	TA		X (3) (4) (5)	C / W (6)	(1) Chargers are to be adequate for the batteries for which they are intended and provided with a voltage regulator (2) See also items **K8** and **K9** (3) Testing of battery chargers includes Type tests and Routine tests as per NR467, Pt C, Ch 2, Sec 7, [2.2] (4) Electronic components of the battery chargers are to be constructed to withstand the tests required in NR467, Pt C, Ch 3, Sec 6 (5) Type test on prototype battery charger or on at least the first batch of battery chargers. When battery chargers are fabricated in batch, type tests are to be carried out on the first battery charger of the batch (6) Tests of battery chargers of 5 kW and over intended for essential services are to be attended by a Surveyor of the Society

ELECTRICAL EQUIPMENT - ITEM K						
No.	Item	Product certification				Remarks
		Design assessment / Approval	Raw material certificate	Examination and testing	Product certificate	
K25	Generating set, Generator set, Generator package (1) (2) (3)	DA		X (4)	C (5)	(1) See relevant provisions of items **K1**, **K2**, **K3** (Generators), item **F17** (Gas turbines), items **E1** and **E11** (Diesel engines) (2) When the generator set is made of components already covered by individual certifications (bare engine, alternator, automation), the assembled package or skid is subject to special consideration for approval by the Society. "DA" on a case-by-case basis is required for its compliance to relevant provisions of NR467, NR445 (3) The general approach described here may be applied for a Compressor package (4) As per agreed program (5) Final certification for the genset package prior to installation onboard (6) See also item **G2** (for Reduction gears, reverse reduction gears, and multipliers), item **G26** (for Piping), **G30** (for Vessels), **G42** (for Hydraulic systems), relevant provisions of item **K** (for Electrical equipment), relevant provisions of item **N** (for Automation systems), and other relevant items of this NR266 (7) For equipment and components not covered by the individual certifications of the engine and generator (8) Testing and/or document review, as applicable
	1- Diesel engine or Gas turbine (driver)	(1) (2)	(1) (2)	(1) (2)	C (1) (2)	
	2- Generator (electrical generator) or alternator	(1) (2)	(1) (2)	(1) (2)	C (1) (2)	
	3- ECMs (controls), sensors, electrical harnesses (cabling), flexible hoses, auxiliaries, coolers/heaters/filters, insulation materials, fuel/lube oil spraying protections, crankcase relief valves, turbochargers, couplings, local control panels, voltage regulators, AVR, speed governor, enclosure and associated ventilation and fire/gas protection systems, reduction gears or multipliers), coupling system, etc., as applicable (6)	TA or DA (7)	C / W (8)	X (4)	C / W (8)	

ELECTRICAL EQUIPMENT - ITEM K						
No.	Item	Product certification				Remarks
		Design assessment / Approval	Raw material certificate	Examination and testing	Product certificate	
K26	Batteries used for propulsion and/or electric power supply purpose during ship operation (1) (2)					(1) As per NR467, Part F, Ch 11, Sec 21. The additional class notation **BATTERY SYSTEM** may be assigned to ships when batteries are used for propulsion and/or electric power supply purpose during ship operation. This notation is mandatory when the ship is relying only on batteries for propulsion and/or electrical power supply for main sources. (2) See also items **K8** and **K9** (3) Type Approval is required with work's recognition: IBV scheme/HBV scheme (as per NR320) (4) When a battery pack is installed with a BMS, the type approval is to cover battery pack and BMS. A case-by-case approval can be applied with the same review and testing as for the type approval scheme. (5) Definitions as per NR467, Pt F, Ch 14, Sec 1: A battery system is an energy storage device that includes cells, cell assemblies or battery pack(s), as well as electrical circuits and electronics (example of electronics: Battery management system 'BMS', Battery support system 'BSS', cell electronics). | Battery pack means one or more sub-packs that can work or the intended purpose as a standalone unit. Cell means the smallest unit of a battery. (6) Prototype tests and Factory acceptance tests as per NR467, Pt F, Ch 11, Sec 21 Note: On-board tests as per NR467, Part F, Ch 11, Sec 21
	1- Battery pack and associated Battery management system (BMS)	TA (IBV) (3) (4) (5)		X (6)	C	
	2- Battery cells	TA (HBV) (3) (5)		X (6)	W	
K27	Fuel cell systems					(1) In compliance with national or international standard (e.g IEC 62282-3 or equivalent). (2) When < 100 kW and type approved by the Society, work certificate (W) will be accepted. (3) In compliance with national or international standard (e.g IEC 62282-2 or equivalent). (4) For anti-sparking fans (5) As per conditions set in the TA (6) For electrical motors, refer to NR266, item K
	1- Fuel cell power system	TA (1)			C or W (2)	
	• Fuel cell module	TA (3)			C or W (2)	
	• Fuel cell monitoring and control system	TA (1)			C or W (2)	
	2- Fans for hazardous enclosed spaces, and their prime movers					
	• Fans	TA (4)		X	C or W (5)	
	• Prime movers	(6)		X (6)	C	

ELECTRICAL EQUIPMENT - ITEM K						
No.	Item	Product certification				Remarks
		Design assessment / Approval	Raw material certificate	Examination and testing	Product certificate	
K27	3- Fire and gas detection system	TA (7)		X	C	(7) Automation systems: see relevant provisions of NR266, item N (8) Class of piping as per provisions of NR547, Section 3 (9) C: ND ≥ 50mm W: ND < 50 mm (10) In case of welded construction. When the valves have welded elements, the welding procedures are to be examined (11) As per NR216, Ch 2, Sec 3, [7.8]. Non-destructive examination by both MPI and UT methods are to be carried out on all Class I drum-forgings having thickness > 10 mm, intended for Class I piping systems, typically: all valves of large size (having ND ≥ 24") to be tested as per NR547, Section 9 (12) Unit production testing: all valves are to be tested as per NR547, Section 9 (13) TA, or case-by-case DA (14) Checking of the setting (15) When the valves have welded elements, the welding procedures are to be examined (16) As per provisions of NR547 and NR467, Pt C, Ch 1, Sec 10 (17) Non-destructive testing to be carried out as required by NR547, Section 9 (18) W for Seamless pipes, C for longitudinally welded steel pipes (19) For both single and double wall configuration (20) As per provisions of NR547 and NR467, Pt C, Ch 1, Sec 10 (21) Non-destructive testing to be carried out as required by NR547, Section 9 (22) W for Seamless pipes, C for longitudinally welded steel pipes (23) As per provisions of NR547 and NR467, Pt C, Ch 1, Sec 10 (24) W for Seamless pipes, C for longitudinally welded steel pipes (25) Prototype tests to be performed on each type of expansion bellows intended for use on gas fuel piping (26) Refer to Items 6, 7 and 8 as appropriate
	4- Gas fuel valve (8)	DA	C or W (9) (10)	X h ndt (11) (12)	C	
	5- Safety relief valves	TA or DA (13)	C	X h ndt (14) (15)	C	
	6- Fuel pipes for gaseous gas fuel with design pressure equal or lower than 10 bar (Class I or Class II): • Class I: single wall pipes, and ND ≥ 50 mm • Class II: double wall pipes, and ND ≥ 100 mm		C	X h ndt (16) (17)	C	
	• Class I: single wall pipes, and ND < 50 mm • Class II: double wall pipes, and ND < 100 mm		W	X h ndt (16) (17)	C/W 18)	
	7- Fuel pipes for gaseous gas fuel with design pressure higher than 10 bar (Class I) (19) • ND ≥ 50mm		C	X h ndt (20) (21)	C	
	• ND < 50mm		W	X h ndt (20) (21)	C/W (22)	
	8- Outer pipe of double wall fuel pipes (Class II) (23) • ND ≥ 100mm		C	X h ndt	C	
	• ND < 100mm		W	X h ndt	C/W (24)	
	9- Expansion bellows	TA (25)	C (26)	X h ndt	C	

ELECTRICAL EQUIPMENT - ITEM K						
No.	Item	Product certification				Remarks
		Design assessment / Approval	Raw material certificate	Examination and testing	Product certificate	
K28	High-Voltage Shore Connection System (1)	DA or TA (1)	(2)	X (2)	C	(1) As per NR557 High-Voltage Shore Connection System. The additional class notation **HVSC** is assigned in accordance with NR467, Pt A, Ch 1, Sec 2, to ships fitted with high voltage shore connection systems complying with the requirements of NR577. These requirements apply to the design, safety, reliability and availability of shipboard electrical and control engineering arrangements installed to permit operation of services by connection to an external high voltage electrical power supply in port. These requirements are additional to those applicable in other Parts of NR467 Rules for Steel ships. (2) Electrical and control engineering equipment is to be surveyed at manufacturer's works and undergo survey and operational trials on board in accordance with the approved test schedules and applicable testing requirements in NR467, Part C, Chapters 2 and 3.
K29	Braking resistors (1)	DA / TA (1)	(1)	X (2)(3)	C	(1) As per Rules NR467. (2) For Braking resistors, the following tests are to be carried out: - Visual and mechanical inspection and dimensions check - Ohmic value measurement - Insulation resistance measurement - Dielectric test - Earth continuity check - Cabling verification - Function tests of leakage detector, space heater and thermostat. (3) Braking resistors may be provided to absorb excess amounts of regenerated energy and to reduce the speed of the propulsion motor. When provided, they are to be tested in accordance with the relevant provisions of items **K**.
K30	Cables and charging stations within scope of **EVOC** notation					(1) See item **K19**.
	1- Cables	TA (1)		X (1)	C (1)	
	2- Charging stations	DA		X	C	

Item L - Specific Equipment for Offshore Units

SPECIFIC EQUIPMENT FOR OFFSHORE UNITS - ITEM L						
No.	Item	Product certification				Remarks
		Design assessment / Approval	Raw material certificate	Examination and testing	Product certificate	
L0	Note: NR445 "Rules for the classification of offshore units" give the requirements for the assignment and the maintenance of classification for offshore units. The application criteria of the different parts of the present Rules are the following: - NR445, Part A for classification and surveys, which applies to all units - NR445, Part B (for structural safety), NR445, Part C (for facilities: machinery, systems and safety features) and NR445, Part D (for specific requirements dedicated to the service of the offshore unit), which apply to offshore units of welded steel construction. Requirements of NR445, Part D are complementary to the provisions of Parts A, B and C which remain applicable, except when otherwise specified. The classification of units other than those dealt with in the above-mentioned Parts B, C and D is covered by specific Rules published by the society.					
L1	Castings (1)	DA	C (2)	X ndt (3)	C	(1) Especially: - cast nodes - connection and articulation parts (2) As per NR216 and NR480 (3) If repairs are to be done, the repair procedure shall be submitted for preliminary examination
L2	Self elevating mechanisms (1) (2)	DA	C (3)	X h ndt (4) (5)	C	(1) Including jacking systems and locking systems for jack-up units; refer to NR445, Offshore Rules (2) Survey of system components to be done as per relevant requirements of NR445, and relevant provisions of this NR266 (i.e. items **G26** and **G30** for piping and pressure vessels, item **K** for electrical equipment, etc.) (3) As per NR216 and NR480 (4) For welded construction (5) Proof tests and running as per agreed program
L3	Instrumentation for remote gauging of ballast systems (1)	DA		X (2)	C	(1) Concerning other parts of the ballast systems, refer to NR467 (2) Pressure test for hydraulic systems. As for instrumentation systems, refer to item **N5**
L4	Cathodic protection systems with sacrificial anodes (1)	DA or TA	W	X (1)	C / W (2)	(1) As per NR445 and NI423, Corrosion Protection of Steel Offshore Units and Installations (2) As per conditions set in the TA
L5	Cathodic protection systems with impressed currents (1)	DA or TA		X (1)	C / W (2)	(1) As per NR445 and NI423, Corrosion Protection of Steel Offshore Units and Installations (2) As per conditions set in the TA

SPECIFIC EQUIPMENT FOR OFFSHORE UNITS - ITEM L						
No.	Item	Product certification				Remarks
		Design assessment / Approval	Raw material certificate	Examination and testing	Product certificate	
L6	Lifting appliances (1)	DA	C (2)	X	C	(1) As per NR526. See items **O3** regarding additional class notations **ALM** (2) As per NR216 and NR480
L7	Flexible pipes (non-bonded) for production risers (**RIPRO** notation) or for drilling units. The additional class notation (**RIPRO** notation) may be assigned to permanent units fitted with risers meeting the corresponding requirements of NR445, Pt D, Ch 1, Sec 14:	(1)				(1) See API 17J "Specification for Unbonded Flexible Pipe" and ISO 13628-2 "Subsea flexible pipe systems" (2) Mechanical tests on end fittings (3) As per an agreed procedure; see NI364, Verification Scheme for Unbonded Flexible Pipes
	• Risers	TA	C (2)	X (3)	C	
	• Drilling lines	TA	C (2)	X (3)	C	
L8	Fluid swivels (1)	DA	C	X	C	(1) See NR445, Part D
L9	Electrical swivels (1)	DA	C	X	C	(1) See NR445, Part D
L10	Process valves and ESD Valves (1)	TA or DA (2)	C	X h ndt	C	(1) See relevant provisions of items **H** and **I** As per NR216, Ch 5, Sec 7, [1.8]. Non-destructive examination by both MPI and UT methods are to be carried out on all Class 1 drum-forgings having thickness > 10 mm, intended for Class I piping systems, typically: all valves of large size (having nominal diameter ≥ 24") (2) See relevant provisions of NR445, Pt C, Ch 1, Sec 7.
L11	Hydraulic power unit for subsea valves: (1)	DA			C	(1) For electrical motors, refer to item **K5**; for other systems, refer to relevant provisions of this NR266 and of NR445. Also see Hydraulic systems as per items **G42**. Piping, valves and fittings as per items **G26** and **G27** (2) Pump housing: material certificates (C / W) according to the piping class. See item **G31** (3) See item **G28** (4) See item **G30**
	• Pumps (2)		C / W (2)	X h	C	
	• Electrical motor (1)	(1)		X	C / W	
	• Flexible hose assembly (3)	TA	W	X h	C	
	• Hydraulic jack-accumulator (4)	DA	C / W	X h ndt	C	
L12	Cargo offloading pumps and their prime movers (1) (2)	DA	C	X h	C	(1) See relevant provisions of items **H** and **I** (2) For electrical motors, refer to item **K**; for other prime movers (i.e. steam, hydraulic systems), refer to relevant provisions of this NR266 and of NR445

SPECIFIC EQUIPMENT FOR OFFSHORE UNITS - ITEM L						
No.	Item	Product certification				Remarks
		Design assessment / Approval	Raw material certificate	Examination and testing	Product certificate	
L13	Cargo lines (1)	DA	C	X h ndt	C	(1) Class 1 piping system; see relevant provisions of items **H** and **I**
L14	Bonded flexible pipes and marine hoses	TA or DA (1)	C (1) (2)	X (1) (3)	C (1)	(1) Bonded flexible pipes' used as flowlines oil or gas production) are approved as per relevant industry standard API 17K (specification for bonded flexible pipes) (2) Mechanical tests on end fittings (3) As per an agreed procedure; refer to OCIMF, Guide to Purchasing, Manufacturing and Testing of Loading and Discharge Hoses for Offshore Moorings, within 100 m waterdepth
L15	Fibre ropes for deep-water offshore services (1)	TA	C (2)	X ndt	C	(1) As per NI432, Certification of Fibre Ropes for Deepwater Offshore Services (2) As per NI658, Type Approval of fibre and yarns for the manufacturing of fibre rope
L16	Fibre ropes for Single Point Mooring hawsers (1) (2)	TA (3)	C	X ndt	C	(1) For offloading buoys and FP(S)O tandem offloading (2) As per NR216, Ch 10, Sec 6, [1.1.2]; see NI432, NI658 and OCIMF Guidelines for the purchasing and testing of single point mooring hawsers (3) As per NI658, Type Approval of fibre and yarns for the manufacturing of fibre rope
L17	Fibre ropes other than **L15** and **L16**, i.e. intended for emergency towing arrangement, cargo handling gear or similar applications (1) (2)		W	X ndt	C	(1) See item **B7** (2) Requirements as per NR216 Note: As per NR467, Pt B, Ch 12, Sec 4, [4.1.1] - The towing and mooring arrangement as defined in NR467, Pt B, Ch 12, App 2, [1] and the towing and mooring lines as defined in NR467, Pt B, Ch 12, App 2, [2] are given as a guidance but are not required as a condition of classification. Survey of steel wires and fibre ropes for towing and mooring lines, when requested by the Owner, is to be done as per requirements of NR216, Ch 10, Sec 6
L18	LSA equipment: survival crafts, rescue boats, lifebuoys, life jackets, immersion suits, visual signals and other life-saving appliances	(1)		(1)	(1)	(1) Certification of Life-saving appliances is outside the scope of classification. For offshore units intended to be granted the applicable additional class notation **LSA**, type approval certificates showing compliance with SOLAS requirements are required as well as the associated individual or batch production documents

SPECIFIC EQUIPMENT FOR OFFSHORE UNITS - ITEM L						
No.	Item	Product certification				Remarks
		Design assessment / Approval	Raw material certificate	Examination and testing	Product certificate	
L19	Pull-in systems (risers and mooring pull-in systems) (1)	DA (1)		X (2)	C	(1) Optional item **L19**: scope and references to be specially agreed with the Society on a case-by-case basis. Refer to detailed provisions of item **L23** (Offshore handling systems and associated equipment) (2) Shop tests, as per agreed program. See relevant provisions of NR595, Sec 3 (3) See item **G26** (for Piping) and **G42** (for Hydraulic systems) (4) For electrical motors, switchboards, starter cabinets and alarm panels, refer to the relevant provisions of item **K**; for the other systems, refer to the relevant provisions of this NR266 and of NR467 Note: On board load tests, as per agreed program
	1- Main shaft	DA	C	X ndt	C	
	2- Casing or body, main load-bearing structures	DA	C	X ndt	C	
	3- Hydraulic systems (3) (4)	(3)	(3)	X h	C	
	4- Guide roller, Wire stopper, Guide pins	DA	C	X ndt	C	
L20	Mooring (station keeping) system (1): • mooring line components (chains, steel wire ropes and accessories) • hull mounted equipment (fairleads, stoppers,...) • anchors	TA or DA (2)	C (2) (3)	X (2)	C	(1) For offshore units intended to be granted the additional class notations **POSA**, **POSA-HR**, **POSA MU**, or **POSA JETTY** (2) As per provisions of NR216, NR480 and NR493 - Classification of Mooring Systems for Permanent and Mobile Offshore Units (3) For mooring accessories: forges and foundries are to be approved
L21	Process systems on board offshore units (1)					(1) Only for offshore units intended to be granted the additional class notation **PROC** (2) Reviews: • Traceability of materials and review of mill certificates • Welders, and NDT operators qualifications • Forming, heat treating, welding, NDT and other fabrication or testing qualifications • Survey of the fabrication and witnessing of NDT at random • Witnessing of tests such as hydraulic tests, running tests, dielectric tests, etc. • Assessment of the Manufacturer's QA/QC dossier (3) The following reviews: • assessment of an independent design review • review of vendor's test reports / certificates • witness of pressure and final tests. (4) Review by the Society of the Manufacturer's inspection certificate and/or tests reports
	1 - A1 Rating: • Main pumps • Main pressure vessels and pressurised equipment and piping: - for flammable or toxic fluids - equal or above class 300 psi for non flammable or non toxic fluids • Main boilers • Main rotating machinery above 100 kW • Main electrical components such as rotating machines above 100kW, switchboards, control panels and uninterruptible power supplies • Main internal combustion engines • Steam or gas turbines • Well control equipment • Safety shutdown systems.	DA	W (2)	X h ndt (2)	C	

SPECIFIC EQUIPMENT FOR OFFSHORE UNITS - ITEM L						
No.	Item	Product certification				Remarks
		Design assessment / Approval	Raw material certificate	Examination and testing	Product certificate	
L21	2 - A2 Rating: • Small pressure vessels • Internal combustion engines below 370 kW • Pipes, valves and fittings with diameter ≥ to 4" and: - below class 150 psi carrying steam, flammable or toxic fluids - below class 300 psi for other non toxic or non flammable fluids	DA (3)	W (3)	X (3)	C	(5) It is the Manufacturer's responsibility to obtain type approval certificate by a National Administration which is a signatory to the SOLAS Convention 1974 and to submit the corresponding certificate to the Society for review (6) is to be tested by a recognised laboratory recognized by The Society. It is the Manufacturer's responsibility to obtain the written approval and certificate of an independent inspection body. This certificate is to be submitted to the Society for review (7) The Society will: • review the type approval certificates • review the routine test inspection certificates issued by recognised independent inspection body (8) are to be certified or equivalent and the type approval certificate issued by the national approval authority is to be supplied to the Society for review
	3 - A3.1 Rating: • Other pressure (unfired) vessels and heat exchangers • Other pipes, valves and fittings • Other compressors (auxiliaries) • Other pumps • Rotating machines less than 100 kW • Instrumentation • Other electrical equipment		W (4)	X h ndt (4)	W (4)	
	4 - A3.2 Rating • Statutory safety equipment such as safety and life saving appliances, navigation aids, etc.	TA (5)				
	5 - A3.3 Rating • Fire safe valves, passive fire protection materials, etc.	TA (6)		(6)	(6)	
	6 - A3.4 Rating • Electrical components, such as cables, switching devices, computer based systems, fire and gas detection equipment, fire fighting equipment and flexible hoses containing non-flammable and non-toxic fluids	TA (7)		(7)	(7)	
	7 - A3.5 Rating • Electrical components located in hazardous areas	TA (8)				

SPECIFIC EQUIPMENT FOR OFFSHORE UNITS - ITEM L						
No.	Item	Product certification				Remarks
		Design assessment / Approval	Raw material certificate	Examination and testing	Product certificate	
L22	Drilling systems and equipment (1) (2)	DA (2)	C / W (2) (3)	X (2) (4)	C / W (5)	(1) Apply to all drilling systems and equipment intended to be granted the additional class notation **DRILL** (2) As per NR570 (3) The manufacturing/testing of materials should be in accordance with either the relevant provisions of NR445 / NR216 (marine practices), or the provisions of accepted specifications and codes/standards (offshore industry practices) as quoted in NR570. Case-by-case for each particular offshore project, the detailed 'Materials certification requirements' agreed at the design review stage should clarify, among others, the relevant type of document to be produced by the manufacturer's selected materials suppliers: may be either materials certificate W, i.e. material inspection certificates type EN 10204 (3.1), or materials certificate C issued by the Society when agreed with the Operator/Duty holder (4) Where required, the 'traceability of materials and review of mill certificates' should be done with due consideration to the 'Materials certification requirements' specified in the applicable 'design documents' reviewed and case-by-case agreed at the design stage by the Society and the Operator/Duty holder (5) NR570 provides principles and specific requirements for the survey and certification of drilling systems and equipment; for the purpose, survey ratings (A1, A2, A3) are defined in order to address the scope of survey and certification (these requirements are complementary to those of this NR266)

SPECIFIC EQUIPMENT FOR OFFSHORE UNITS - ITEM L						
No.	Item	Product certification				Remarks
		Design assessment / Approval	Raw material certificate	Examination and testing	Product certificate	
L23	Offshore handling systems and associated equipment such as winches, strand jacks, chain jacks, sheaves and their foundations used for lifting/pulling of a load. In particular, the following equipment is covered: Equipment used for the installation and tensioning of mooring lines such as winches, chain jacks and sheaves; Tensioning winches and strand jack systems for riser pull-in (1) (2)	DA (2) (3)	C / W (4)	X (5)	C (2)	(1) Apply to offshore handling systems and associated equipment for ship or offshore units intended to be granted with the additional class notation **OHS** (2) As per NR595. Other handling equipment not listed herein may be covered on a case-by-case basis (the equipment covered by the notation **OHS** is to be used occasionally) (3) Provisions of NR526 are to be complied with regarding: - electrical and hydraulic systems - control and safety systems. (4) The manufacturing/testing of materials should be in accordance with the relevant provisions of NR445 / NR216 (marine practices) (5) The handling systems covered are to be tested at the manufacturer's workshop (FAT) as per procedures and provisions of NR595, Section 3 (6) Survey to be done as per relevant requirements of NR445, Pt C, Ch 1, Sec 3 and NR445, Pt C, Ch 1, Sec 7, or relevant provisions of NR467 (7) Cylinder shell and piston rod only (8) Survey to be done as per relevant requirements of NR445, Part C, Chapter 2, or relevant provisions of NR467 (9) Individual load test Note: The handling systems covered are to be tested after installation on board the unit as per procedures and provisions of NR595, Section 3
	1- Main load carrying structural elements: drum, flanges, supports or baseplate, shaft, etc.		C	X	C	
	2- Gear system		C	X	C	
	3- Ropes		W	X	C	
	4- Hydraulic system components		(6)	X	C / W (6)	
	5- Hydraulic cylinders		C (7)	X	C	
	6- Electric system components	DA or TA (8)	(8)	X	C / W (8)	
	7- Loose gear and accessories		W	X	C (9)	

SPECIFIC EQUIPMENT FOR OFFSHORE UNITS - ITEM L						
No.	Item	Product certification				Remarks
		Design assessment / Approval	Raw material certificate	Examination and testing	Product certificate	
L24	Offshore oil offloading - Transfer arms: (1) • transfer arms applied in a side-by-side configuration • transfer arms applied in a tandem configuration As a rule, the classification covers the following items: - foundations and connections of the transfer system with unit's hull - supporting structures - transfer line and associated equipment including swivels and bearings, when relevant - emergency release system - control/detection systems - equipment for energy supply - mooring and fendering equipment Liquefied gas transfer systems: see Note 3.	TA or DA (2) (3)	C (3)	X (3)	C (3)	(1) As per NR588. Requirements applicable for floating offshore units intended to be granted the additional class notation **oil offloading (transfer arms)**, as defined in NR445, Part A. The detailed scope of classification will be established by the Society on a case-by-case basis, taking into account the specificities and configuration of each transfer system (2) Transfer systems covered by the notation **oil offloading (transfer arms)** and using new or unproven technology are to be subject to a qualification process. The identification of new technology is to be carried based on the provisions of NI525, Risk Based Qualification of New Technology. Documentation containing a list of components of the transfer system categorized as new technology and requiring a qualification process is to be submitted (3) As per the relevant provisions of NR216, NR480, NR588, and when deemed necessary, the applicable requirements of: - OCIMF "Design and Construction Specification for Marine Loading Arms (Third Edition 1999)" - European Standards EN 1474-1 "Design and testing of marine transfer systems", Part 1 (Design and testing of transfer arms) - EN 1474-3 "Design and testing of marine transfer systems", Part 1 (Offshore transfer systems) Note 1: Site acceptance tests are to be performed in accordance with the requirements of EN 1474-1, [8.4.8] Note 2: Oil offloading (transfer arms): The additional class notation Oil offloading (transfer arms) may be assigned to units having a transfer system for oil products, using transfer arms, and complying with the requirements of NR588 Offshore Oil Offloading - Transfer Arms. This additional class notations covers the following types of transfer systems: side-by-side transfer arms, tandem transfer arms Note 3: Liquefied gas transfer: The additional class notation liquefied gas transfer may be assigned to units having a liquefied gas transfer system fitted on-board, complying with the requirements of NR542 - Rules for the Classification of Offshore Floating Gas Units. This additional class notation covers the following types of transfer systems: side-by-side transfer arms, tandem transfer arms, transfer systems based on flexible hoses

SPECIFIC EQUIPMENT FOR OFFSHORE UNITS - ITEM L						
No.	Item	Product certification				Remarks
		Design assessment / Approval	Raw material certificate	Examination and testing	Product certificate	
L25	Diving systems and equipment (1)	DA (1)	(1)	X (1)	(1)	(1) Survey as per relevant provisions of NR610 for diving systems and equipment
L26	Offshore access systems (OAS) materials and components (1)	DA (1)		X (1)	C (1)	(1) NI629 provides guidelines for the certification of offshore access systems (OAS) based on gangways and used for the transfer of persons from ships to offshore facilities or from ship to ship. The principles and requirements developed in NI629 are applicable to active and passive offshore access systems (OAS), as defined in NI629, Sec 1, [4.2]. This Guidance Note also provides requirements for the classification of the offshore access system, i.e. its integration on the supporting ship on which it is fitted (2) As per relevant requirements of NR467 and NR445 - See items **G26** (Piping) and **G42** (Hydraulic systems) (3) Cylinder shell and piston rod only (4) For electrical components, refer to the relevant provisions of item **K**; for the other systems, refer to the relevant provisions of this NR266 and of NR467 (5) For control and monitoring system, refer to the relevant provisions of items **K** and **N**; for the other systems, refer to the relevant provisions of this NR266 and of NR467 (6) Calibration test report, in accordance with an agreed program (7) Product certificate required for active OAS (8) As per relevant provisions of this NR266 or in compliance with an international standard. See also item **O3** for ropes (9) Proof load as per NR526. See also item **O5** for loose gear Note: On board load tests, as per agreed program
	1- Main load bearing structure		C	X ndt	C	
	2- Mechanical gears		C	X	C	
	3- Bearings		W	X	W	
	4- Slewing ring		C	X	C	
	5- Connection/disconnection device		W	X	W	
	6- Bolts and nuts				W	
	7- Hydraulic system components of class I		C (2)	X h ndt	C (2)	
	8- Hydraulic cylinders		C (3)	X h ndt	C	
	9- Winches		C	X	C	
	10- Electric system components	(4)	(4)	(4)	(4)	
	11- Control and monitoring system	(5)	(5)	(5)	(5)	
	12- Motion reference unit (6) (7)			X (6)	W / C (7)	
	13- Wire ropes (8)		W	X (8)	C	
	14- Loose gear and accessories (9)			X (9)	C	
L27	Gas production or liquefaction components for Floating gas units (1) (2) (3) (4) (5) (6) (7)					(1) As per NR542 - Classification of Floating Gas Units. Also see relevant provisions of item **L21** for Rating principles (NR459) (2) Only applicable for units having one of the structural type notations and service notations defined in NR542. These requirements are complementary to the provisions of NR445 Rules for the Classification of Offshore Units, which remain applicable, except where otherwise specified
	Boil-Off Gas (BOG) Handling system (8) Boil-Off Gas (BOG) Handling system, as part of Refrigeration / Reliquefaction systems (9)	TA (10)		X (11)	C	
	1- Compressor	TA or DA	C	X h ndt	C	

SPECIFIC EQUIPMENT FOR OFFSHORE UNITS - ITEM L						
No.	Item	Product certification				Remarks
		Design assessment / Approval	Raw material certificate	Examination and testing	Product certificate	
L27	2- Turbine	TA or DA	C / W	X h ndt	C	(3) Units intended to be assigned with the service notation(s) **liquefied gas storage**, are to comply with the requirements of IGC Code, except where otherwise specified in NR542. NR542 provides additional requirements and interpretations of IGC Code to be considered for the purpose of classification (4) All the gas production system components covered by the service notation **PROC-GP** are to comply with the relevant requirements of NR459 Process Systems Onboard Offshore Units and Installations, with regards to design, certification, construction survey and testing. (5) All the gas liquefaction system components covered by the service notation **PROC-GL** are to comply with the relevant requirements of NR459 Process Systems Onboard Offshore Units and Installations, with regards to design, certification, construction survey and testing. (6) Systems and components covered by the additional class notation **PROC** are to comply with the requirements of NR459 Process Systems Onboard Offshore Units and Installations (7) Additional class notation **PROC, PROC-GL or PROC-GP** - Also see item **L21** (8) See relevant provisions of NR467, Pt D, Ch 9, Sec 7, [2] and NR542, Section 13. Also see item **H26** (9) In case a component, material or equipment is not listed, refer to the applicable survey requirement of relevant item of this NR266 (10) TA, or DA (on a case-by-case basis) (11) As per agreed program, based on the requirements of IGC Code and/or standards recognized by the Society (12) Heat exchangers (Class 1 vessel) (13) Automation systems: see relevant provisions of items **K** and **N5** (14) As per conditions set in the TA Note 1: Onboard tests are intended to demonstrate that the plant with associated safety features is functioning properly in compliance with the Rules criteria. The tests are to be witnessed by a Surveyor Note 2: Boil-Off Gas (BOG) Handling system: to consider NR467, Pt C, Ch 3, Sec 3 (or IACS UR E22).
	3- Electric motor	TA or DA	C / W	X	C	
	4- Heat exchangers (12)	DA	C	X h ndt	C	
	5- Sensors, transmitters, flow meters, PT100 and PLC, Circuit breakers, Electric Cables	TA (13)		X	C / W (14)	
	6- Cryogenic piping systems, cryogenic valves, cryogenic flexible hoses assembly	TA or DA	C	X h ndt	C	
	7- Other piping systems, valves, flexible hoses assembly and expansion bellows	TA or DA	C / W	X h ndt	C	

Item M - Refrigerating Installation covered by Additional Class Notation REF (REF-CARGO, REF-CONT, REF-STORE)

REFRIGERATING INSTALLATION COVERED BY ADDITIONAL CLASS NOTATION REF (REF-CARGO, REF-CONT, REF-STORE) - ITEM M						
No.	Item	Product certification				Remarks
		Design assessment / Approval	Raw material certificate	Examination and testing	Product certificate	
M	Note: The requirements of NR467, Part F, Chapter 7 summarized in this item **M** are specific to permanently installed refrigerating installations and associated arrangements and are to be considered additional to those specified in NR467, Pt C, Ch 1, Sec 15 (addressed in item **G35**) which are the minimum requirements mandatory for all ships with refrigerating installations - Individual pieces of equipment: shop tests are to be carried out on pumps, fans, electric motors and internal combustion engines forming parts of refrigerating installations, following procedures in accordance with the requirements applicable to each type of machinery. The relevant running data (capacity, pressure head, power and rotational speed, etc.) are to be recorded for each item - Pressure tests of components at the workshop include hydrostatic test (strength) and leak test (tightness) as per NR467, Part F, Chapter 7 - At least one refrigerating unit of each type installed on board is to be subjected to shop tests in order to ascertain its refrigerating capacity in the most unfavourable temperature conditions expected, or in other temperature conditions agreed by the Society Where the complete unit cannot be shop tested (for instance, in the case of direct expansion installations), alternative test procedures are to be agreed with the Society					
M1	Refrigerating compressors, and their prime movers	DA				(1) Compressor crankshaft or rotor, couplings, connecting rods and piston rods; compressor liners, cylinder heads and other parts subjected to pressure (2) Including, for refrigerated container ships, checking at works of the performances as per Rules (3) Non electrical (i.e. hydraulic); for electrical motors, refer to item **K5**; diesel engines as per item **E1**
	1- Refrigerating compressors		C (1)	X h (2)	C	
	2- Prime movers (3)			X h	C / W (3)	
M2	Condenser circulating pumps, and their prime movers	DA				(1) Pump housing: material certificates (C / W) according to the piping class. See item **G31** (2) Including, for refrigerated container ships, checking at works of the performances as per Rules, where the prime movers have an output exceeding 50 kW (3) Non electrical (i.e. hydraulic); for electrical motors, refer to item **K5**
	1- Condenser circulating pumps		C / W (1)	X h (2)	C	
	2- Prime movers (3)			X h	C / W (3)	
M3	Brine and refrigerant pumps, and their prime movers	DA				(1) Casing if temperatures ≤ – 40°C (2) Including, for refrigerated container ships, checking at works of the performances as per Rules, where the prime movers have an output exceeding 50 kW (3) Non electrical (i.e. hydraulic); for electrical motors, refer to item **K5**
	1- Brine and refrigerant pumps		C (1)	X h (2)	C	
	2- Prime movers (3)			X h	C / W (3)	
M4	Air-cooler fans and their prime movers (1)	DA		X (2)	C	(1) For electrical motors driving fans, refer to item **K5** (2) Determination of characteristics: capacity, pressure and power consumption

REFRIGERATING INSTALLATION COVERED BY ADDITIONAL CLASS NOTATION REF (REF-CARGO, REF-CONT, REF-STORE) - ITEM M						
No.	Item	Product certification				Remarks
		Design assessment / Approval	Raw material certificate	Examination and testing	Product certificate	
M5	Condensers, heat exchangers, evaporators of shell type (tube or welded plate) and similar apparatuses: body, shell, covers, tubes or plates (1) (2)	DA		X h ndt (3)	C	(1) Brine (coolant): requirements as per pressure vessels criteria. See item **G30** (pressure vessels for liquid substances) (2) Particular attention is drawn to provisions of NR467, Pt F, Ch 7, Sec 1, [7.5] regarding air coolers arrangement (3) Pressure tests as per Rules (4) See items **G30** and **G35** (5) Except for water side (6) Individual hydraulic test and non-destructive examination by approved method
	1- Body or shell (4)		C	X ndt	C	
	2- Covers		C (5)	X ndt	C	
	3- Tubes or plates		C	X h (6)	C	
M6	Pressure vessels: oil separators, intermediate receivers and other pressure vessels included in the gas circuit (1)	DA	C	X h	C	(1) See items **G30** and **G35**
M7	Refrigerant pipes: steel and copper tubing for evaporator and condenser coils and for pressure piping in general (1)		C	X h	C	(1) See items **G26** and **G35**
M8	Accessories of refrigerant pipes (1)		C	X h	C	(1) See items **G27**, **G28** and **G35**
M9	Brine pipes (1)		W	X h	W	(1) Class III piping system. See items **G26** and **G35**
M10	Accessories of brine pipes (1)		W	X h	W	(1) Class III piping system. See items **G27**, **G28** and **G35**
M11	Equipment of refrigerated container ships					(1) See item **M2** (2) See item **M1** (3) Automation systems: see relevant provisions of item **N** (4) Calibration by the manufacturer. The Society reserves the right to require random checks of the calibration Note: For less important installations, running tests could be made on board
	1- Air ducts and couplings	DA		X h	C	
	2- Circulating pumps (1)	DA			C	
	3- Compressors (2)	DA			C	
	4- Temperature monitoring system	DA (3)		X h	C	
	5- Temperature sensors (detectors and thermometer)	TA (3)		X (4)	C / W	

REFRIGERATING INSTALLATION COVERED BY ADDITIONAL CLASS NOTATION REF (REF-CARGO, REF-CONT, REF-STORE) - ITEM M						
No.	Item	Product certification				Remarks
		Design assessment / Approval	Raw material certificate	Examination and testing	Product certificate	
M12	Instrumentation (level detector, thermometers, pressure detector)	TA (1)		X (2)	C / W (3)	(1) Automation systems: see relevant provisions of item **N** (2) Calibration by the manufacturer. The Society reserves the right to require random checks of the calibration (3) As per conditions set in the TA
M13	Refrigerants (1)	(2) (3)	W	X	W	(1) For direct refrigerating systems: R12, R21, R22, R113, R114, R134a, R500, R502. The use of refrigerants other than those listed may be authorized by the Society on a case-by-case basis, provided that the physical properties and chemical analysis are clearly stated and the appropriate safety measures are foreseen in the installation design (2) Ammonia (R717) may be used only in indirect system refrigerating plants (3) Restrictions on the selection of refrigerants: see also item **G35**

Item N - Automation Systems covered by Additional Class Notations AUT

AUTOMATION SYSTEMS COVERED BY ADDITIONAL CLASS NOTATIONS AUT - ITEM N						
No.	Item	Product certification				Remarks
		Design assessment / Approval	Raw material certificate	Examination and testing	Product certificate	
N0	The following Notes apply to all items from **N1** to **N10**: Note 1: Automation systems requirements are divided in 2 parts: • Hardware: Automation systems are to be tested according to NR467, Pt C, Ch 3, Sec 6. The list of tests will depend on their design and their installation on board. The test program is to be submitted for approval. Automation systems are to be tested, at works and on board, when required. Tests are to be carried out under the supervision of a Surveyor of the Society. • Software: Automations systems are to be documented and tested depending on their Category (Cat I, Cat II, Cat III) according to NR467, Pt C, Ch 3, Sec 3, Tab 2. The category will depend on the risk assessment for all operational scenarios. The surveyor will ensure that a Software quality system is in place and that the proper documentations and justifications are available. In addition, software of automation systems will be submitted to functional tests, integration tests before installation on board and final integration tests, depending on their category. Note 2: Automation systems covered by additional class notations **AUT**: Documentation and approval as per relevant provisions of: • NR467, Pt F, Ch 3 for notations **AUT-UMS**, **AUT-CCS**, **AUT-PORT** or **AUT-IMS** • for offshore units: NR445, Pt C, Ch 3 for notation **AUTO** • for naval ships: NR483, Pt E, Ch 4, for notations **AUT-QAS**, **AUT-PORT**, **AUT-IAS**. Testing according to NR467, Pt C, Ch 3, Sec 6. Note 3: Cyber security for the classification of marine units: The requirements of NR659 apply to design, construction, commissioning and maintenance of computer based systems where they depend on software for the proper achievement of their functions. The requirements focus on the functionality of the software and on the hardware supporting the software. These requirements apply to the use of IT (Information Technologies) and OT (Operational Technologies), computer based systems which provide, communicate or transport control, alarm, monitoring, safety or internal communication functions which are subject to classification requirements. The additional class notations **CYBER MANAGED**, **CYBER RESILIENT** and **CYBER SECURE** may be assigned to ships or offshore units whose equipment and networks comply with the requirements of NR659. For equipment to be fitted onboard a ship having the additional class notation **CYBER SECURE**, any equipment defined in the scope of application is to be approved in compliance with the requirements of NR659, Chapter 3 Note 4: Type approvals (TAC) addressed as per NR659 typically include cyber equipment, cyber monitoring system, cyber data diode, cyber ship-shore data sharing system, and other cyber security services. Note 5: Cyber security for products to be installed on-board naval ships: The requirements of NR642 apply to naval ships covered by NR483. they can be applied on request to other kind of ships. The goal of NR642 is to define a process in order to assess: that a manufacturer has set in place procedures in order to deliver products following requirements regarding cyber security, and that a product delivered by a manufacturer fulfils requirements regarding cyber security. Any equipment containing any logical code or addressable memory should be considered in the scope of NR642. The Cyber security requirements contained therein are dedicated to manufacturers and their products. The agreement between the Society and the Manufacturer does not need to be linked to a specific ship classification. Upon satisfactory completion by the Society of security verification and surveys, the Society delivers to the manufacturer survey certificates in accordance with NR642. Note 6: Control console (BCC) and engine control console (ECC): Each product certificate is to include reference to the corresponding console. As applicable, the equipment/item(s) installed on the console are certified by the Society as per relevant rule or TAC granted to manufacturer of each equipment according to purchaser order by console manufacturer. Also see NR467 Pt C, Ch 3, Sec 4, [5]; Sec 5, [5] and Sec 6, [3]. As far as electrical distribution and cabling are concerned, NR467, Pt C, Ch 2, Sec 8, [2] and [3] may be applicable.					

AUTOMATION SYSTEMS COVERED BY ADDITIONAL CLASS NOTATIONS AUT - ITEM N						
No.	Item	Product certification				Remarks
		Design assessment / Approval	Raw material certificate	Examination and testing	Product certificate	
N1	Machinery monitoring and alarm systems	TA or DA (1)		X (2)	C / W (3)	(1) As per NR467, Part F, Chapter 3 (or, as applicable, NR445, Part C, Chapter 3 or NR483, Part E, Chapter 4) and relevant requirements of NR467, Part C, Chapter 3 (2) According to a program to be agreed with the Society (3) As per conditions set in the TA
N2	Propulsion plant remote control systems: diesel engines, turbines, clutches, controllable pitch propellers, thrusters, automatic shaft brakes, …	TA or DA (1)		X (2)	C / W (3)	(1) As per NR467, Part F, Chapter 3 (or, as applicable, NR445, Part C, Chapter 3 or NR483, Part E, Chapter 4) and relevant requirements of NR467, Part C, Chapter 3 (2) According to a program to be agreed with the Society (3) As per conditions set in the TA
N3	Control and monitoring systems for auxiliaries equipment: generating sets, boilers, air compressors, fresh water generators, …	TA or DA (1)		X (2)	C / W (3)	(1) As per NR467, Part F, Chapter 3 (or, as applicable, NR445, Part C, Chapter 3 or NR483, Part E, Chapter 4) and relevant requirements of NR467, Part C, Chapter 3 (2) According to a program to be agreed with the Society (3) As per conditions set in the TA
N4	Fire or gas detection systems: detectors, control cabinet,...	TA or DA (1)		X	C / W (2)	(1) In the case of a discrepancy between the provisions of the applicable International and National statutory regulations and those of the Society's Rules, normally the former take precedence. A valid certification to MED 2014/90/EU is to be recognised for classification purpose (2) As per conditions set in the TA
N5	Sensors and control equipment and/or monitoring devices: 1- Sensors: Pressure or temperature sensors, shut-down electric valves, level sensors, automatic pressure, temperature or level controllers,...) 2- Control equipment and / or monitoring devices: Alarm panels, electronic protective devices, automatic and remote control equipment, actuators, safety devices for installations intended for essential services, electronic speed regulators for auxiliary engines, …)	TA or DA (1)		X (1)	C / W (2)	(1) As per NR467, Part F, Chapter 3 (or, as applicable, NR445, Part C, Chapter 3 or NR483, Part E, Chapter 4) and relevant requirements of NR467, Part C, Chapter 3 (2) As per conditions set in the TA

AUTOMATION SYSTEMS COVERED BY ADDITIONAL CLASS NOTATIONS AUT - ITEM N						
No.	Item	Product certification				Remarks
		Design assessment / Approval	Raw material certificate	Examination and testing	Product certificate	
N6	Integrated computer-based system (1)	TA or DA (2)		X (3)	C / W (4)	(1) Integrated system is a system consisting of two or more subsystems having independent functions connected by a data transmission network and operated from one or more workstations (data communication link includes point to point links, instrument net and local area networks, normally used for inter-computer communication on board units. The software and hardware which support the data communication are also included) (2) As per NR467, Part F, Chapter 3 (or, as applicable, NR445, Part C, Chapter 3 or NR483, Part E, Chapter 4) and relevant requirements of NR467, Part C, Chapter 3 (3) According to a program to be agreed with the Society (4) As per conditions set in the TA
N7	Condition Monitoring Systems (CMS) and Computerized Maintenance Management Systems (CMMS)	TA / DA (1)		X (2)	C / W (3)	(1) Approval of hardware and software as per NR674 and NI684 for additional service feature **[CBM]**, and as per NR496 for computerized maintenance management systems (CMMS) (2) According to a program to be agreed with the Society (3) As per conditions set in the TA / DA.
N8	Programmable logic controllers (PLC) and computers used for tasks essential to safety, all components related to safety functions	TA or DA (1)		X (1) (2)	C / W (3)	(1) Hardware and software type approval and testing as per NR467, Part F, Chapter 3 (or, as applicable, NR445, Part C, Chapter 3 or NR483, Part E, Chapter 4) and relevant requirements of NR467, Part C, Chapter 3 (2) According to a program to be agreed with the Society (3) As per conditions set in the TA
N9	Expert system (1)	TA (HBV) or DA (2) (3)		X (4)	W (5)	(1) Expert system is an intelligent knowledge-based system that is designed to solve a problem with information that has been compiled using some form of human expertise (2) As per NR467, Part F, Chapter 3 (or, as applicable, NR445, Part C, Chapter 3 or NR483, Part E, Chapter 4) and relevant requirements of NR467, Part C, Chapter 3 (3) The expert system software is not to be implemented on a computer linked with essential functions. Expert system software is not to be used for direct control or operation, and needs human validation by personnel on watch (4) According to a program to be agreed with the Society (5) As per conditions set in the TA (HBV)

AUTOMATION SYSTEMS COVERED BY ADDITIONAL CLASS NOTATIONS AUT - ITEM N						
No.	Item	Product certification				Remarks
		Design assessment / Approval	Raw material certificate	Examination and testing	Product certificate	
N10	Loading instrument or calculator / Stability computer (1)	TA or DA (1)		X (2)	C / W (3)	(1) Approval of hardware, basic software and application software according to relevant provisions of NR467, Pt C, Ch 3, Sec 6 and NR467, Part B. Also see item **B20** (2) According to a program to be agreed with the Society (3) As per conditions set in the TA

Item O - Lifting Appliances for Ships and Offshore Units

LIFTING APPLIANCES FOR SHIPS AND OFFSHORE UNITS - ITEM O						
No.	Item	Product certification				Remarks
		Design assessment / Approval	Raw material certificate	Examination and testing	Product certificate	
O	The following notes apply to all items: **O1** for derricks; **O2** and **O3** for cranes; **O4** for SAS (supply at sea) components, **O5** for winches not covered by items **O1**, **O2**, **O3** or **O4**. Note 1: Scope and limitation: It is applicable to materials and components intended to be part of lifting appliances and accessories covered by NR526 fitted on ships, floating supports, fixed or mobile offshore platforms, and used at harbour or in offshore conditions (for loading or unloading cargoes, equipment, spare parts or consumables). The use of lifting appliance for personnel transfer operations is excluded from the Class approval scope, except if **-MR** notation is granted; the use of lifting appliance for personnel transfer is subject to regulations of the relevant Flag administration. Note 2: The applicable requirements for cranes depend on the actual context, which is a mix of Statutory/International regulations and National and Flag Authority regulations for the given ship/marine unit. In this respect, three cases may be found: • ILO 152 / ILO 160 (disregarding any specific Flag Authority regulations). Voluntary request to the Society. • ILO 152 / ILO 160 + specific National or Flag Authority regulations (i.e. typically: the French Maritime Regulations “Règlementation de la Sécurité des Navires”, Division 214). Mandatory as per Ship’s flag requirements. • Classification Rules requirements, as per additional class notation (i.e. **ALP**, **ALM**). Mandatory as per Classification requirements. Therefore, a case-by-case examination enables to identify which of the three previous options should be applied to a particular equipment (Crane) for a given ship or offshore unit entitled to fly the Flag of a given State. Note 3: Scope of classification for cranes and derricks (as per NR526): The additional class notations **ALP**, **(ALP)**, **ALM**, **(ALM)** are granted to the supporting ship or offshore units. The notation **ALM** may be completed by: **-EN** when, in addition, the lifting appliances are in compliance with additional safety requirements, or **-SUBSEA** when, in addition, the lifting appliances are intended to be used for lifting of subsea equipment and are in compliance with relevant provisions of NR526. The additional class notations **ALP**, **ALM**, **ALM-EN** and **ALM-SUBSEA** may be completed by **-MR** when, in addition, the lifting appliances are intended to be used for lifting of personnel and are in compliance with NR526, Ch 3, Sec 3. Note 4: When the Lifting appliance is intended for certification in compliance with statutory regulations without additional class notation, as per NR526 Ch 1 Sec 1 [2], see item **O2**. The certificates issued by the Society on behalf of Administration correspond to the forms recommended by ILO for entering them in the Register of ship’s Lifting appliances. • The materials are to be identified by certificate W (Works') issued by the Manufacturer, and submitted to the Surveyor for review (materials to be in compliance with NR216 or accepted specifications). The Works' certificate issued by the Manufacturer shall indicate the guaranteed chemical and mechanical properties (i.e. may be material inspection certificates type EN 10204-3.1) as well as the results of the tests performed. • Loose gear are to be documented by the Manufacturer with relevant product certificates in accordance with ILO regulations. Note 5: When the Lifting appliance is intended to be covered by Classification, as per NR526 Ch 1 Sec 1 [3] with additional class notation **ALP**, or **ALM** assigned with construction mark ✠, see item **O3**: • The materials are to be covered by BV product certificate issued by a Surveyor of the Society (materials to be in compliance with NR216 or accepted specifications). The tested materials are to be individually certified by the Society; an alternative inspection scheme may be agreed by the Society with the Manufacturer whereby the attendance of the Surveyor will not be required. • The BV product certificate mentioned in a) is required in addition to any other Manufacturer's documents (i.e. material inspection certificates type EN 10204 - 3.1) included in the Manufacturer Record Book. Note 6: For Supply at Sea (SAS) components: the additional class notation **SAS** is assigned in accordance with NR467, Pt A, Ch 1, Sec 2 to ships having the service notation **supply** fitted with installations for underway ship-to-ship supply at sea of liquid and solid supplies. See item **O4**. Note 7: Programmable logic controllers (PLC) and computers used for tasks essential to safety, all components related to safety functions: see relevant provisions of item **N8**					

LIFTING APPLIANCES FOR SHIPS AND OFFSHORE UNITS - ITEM O						
No.	Item	Product certification				Remarks
		Design assessment / Approval	Raw material certificate	Examination and testing	Product certificate	
O1	Derricks (1)	DA	(2)	X (3)	C	(1) As per NR526 (2) Materials as per NR216 (3) Shop tests as per agreed program (4) See item **B18** (5) For welded construction; the extent and the nature of the non-destructive examinations are subject to the Society's agreement (6) See the corresponding requirements of items **O2** or **O3**, as applicable. (7) May be submitted to individual assessment in separate scope as per the corresponding requirements of items **O2** or **O3**, as applicable. (8) No individual design assessment of winches; the main load carrying structural elements of winches (drum, flanges, supports or baseplate, shaft, etc.) are reviewed as part of item **O1** structures (9) Survey of other equipment to be done as per relevant requirements of Rules: i.e. for piping and pressure vessels, see items **G26** and **G30**; for electrical equipment, see the corresponding requirements of items **O2** or **O3**, as applicable. (10) Control and monitoring system, refer to the relevant provisions of items **K** and **N** (Automation systems) Note: Running tests on board as per agreed program
	1- Masts and boom supports (4)		C	X	C	
	2- Derrick booms		C	X ndt (5)	C	
	3- Gooseneck		C	X	C	
	4- Span block trunnions		C	X	C	
	5- Ropes for lifting, span and slewing		W	X (6)	C	
	6- Loose gear (blocks, hooks, shackles)	(7)	C	X ndt	C	
	7- Other component essential for the function of the lifting appliance, or structural items, i.e. winches (if any)	(8) (9) (10)	C	X	C	
O2	Lifting appliances (except derricks, but including cargo lifts) intended for certification in compliance with statutory regulations	DA		X (1)	C (2)	(1) Refer to NR526, Ch 4, Sec 1, [6] (2) Product certificate is issued when all tests required by NR526 are performed, in particular: - overload test - functional test. (3) The material inspection certificate is to be of type EN 10204-3.2 and is to indicate the guaranteed chemical and mechanical properties as well as the results of the tests performed. (4) For welded construction. The extent and the nature of the non-destructive examinations are subject to the Society's agreement. Refer to NR526, Ch 4, Sec 1, [3] (5) The material inspection certificate is to be of type EN 10204-3.1 or 3.2 and is to indicate the guaranteed chemical and mechanical properties as well as the results of the tests performed. (6) Refer to NR467
	1 - Main structure					
	• Slewing/flange rings	DA	W (3)	X ndt (4)	W	
	• Jib, crane house, platforms	DA	W (5)	X ndt (4)	W	
	• Pedestal (not welded to the hull)	DA	W (3)	X ndt (4)	W	
	• Load bearing shafts	DA	W (5)	X ndt (4)	W	
	• Other load carrying structural elements	DA	W (5)	X ndt (4)	W	
	• Fixed parts of lifting appliances and elements connecting them with the ship structure (6)	DA	C	X	C	

LIFTING APPLIANCES FOR SHIPS AND OFFSHORE UNITS - ITEM O						
No.	Item	Product certification				Remarks
		Design assessment / Approval	Raw material certificate	Examination and testing	Product certificate	
	2 - Mechanical elements					(7) Refer to NR526, Ch 4, Sec 1, [3] (8) Refer to item **G30** (9) Refer to items **G26** / **G27** (10) As per Society's agreement
	• Slewing ring bearing	DA	W	X	C	
	• Bolts and nuts of slewing bearing		W		W	
	3 - Machinery components and hydraulic systems (7)					
	• Winches	DA / TA		X	W	
	• Reduction gears				W	
	• Hydraulic accumulator (8)	DA / TA		X	W / C	
	• Hydraulic motors / pumps			X	W	
	• Hydraulic luffing cylinders class	DA / TA	W	X h ndt	C	
	• Flexible hoses	TA	W	X h	W	
O2	• Piping system (9)		W	X h ndt	W / C	
	• Auxiliary machinery items essential for the function of the lifting appliance	(10)	(10)	(10)	(10)	
	4 - Electrical equipment					
	• Electric motors for essential functions of the lifting appliance	DA / TA			W	
	• Cables	DA / TA			W	
	• Circuit breakers	DA / TA			W	
	• Contactors	DA / TA			W	
	• Convertors	DA / TA			W	
	• Switchboard	DA		X	W	
	• Slip rings	DA / TA			W	
	• Other electrical equipment essential for the function of the lifting appliance				W	

LIFTING APPLIANCES FOR SHIPS AND OFFSHORE UNITS - ITEM O						
No.	Item	Product certification				Remarks
		Design assessment / Approval	Raw material certificate	Examination and testing	Product certificate	
O2	5 - Loose gear (Blocks, hooks, shackles …)					(11) Refer to NR526, Ch 4, Sec 1, [3] (12) Depending on SWL as per NR526, Ch 4, Sec 1, [7] (13) For welded construction, the extent and the nature of the non-destructive examinations are subject to the Society's agreement. (14) As per NR216. As alternative, tests and checking carried out in compliance with international or national standards may be accepted if they are considered as equivalent (e.g. ISO 3178 “Steel wire ropes for general purposes - Terms of acceptance”). Refer to NR526, Ch 4, Sec 1, [5] (15) As per NR216. Refer to NR526, Ch 4, Sec 1, [5]
	• Sheaves	DA / TA	W (11)	X ndt (12) (13)	C	
	• Hooks	DA / TA	W (11)	X ndt (12) (13)	C	
	• Blocks	DA / TA	W (11)	X ndt (12) (13)	C	
	• Lifting beams	DA	W (11)	X ndt (12) (13)	C	
	6 - Ropes					
	• Wire ropes		W	X (14)	C	
	• Fibre ropes		W	X (15)	C	
O3	Lifting appliances (except derricks, but including cargo lifts and lifting of personnel) intended to be under the scope of classification of the supporting ship or offshore unit	DA / TA		X (1) (2) (3)	C (4)	(1) Refer to NR526, Ch 4, Sec 1, [6] (2) For offshore cranes refer to NR526, Ch 4, Sec 1, [8] (3) For lifting of personnel refer to NR526, Ch 4, Sec 1, [9] (4) Product certificate is issued when all tests required by NR526, Ch 4, Sec 1 are performed, in particular: - overload test - functional test. (5) For welded construction, the extent and the nature of the non-destructive examinations are subject to the Society's agreement. Refer to NR526, Ch 4, Sec 1, [3] and NR526, Ch 4, Sec 1, [4] (6) Refer to NR467
	1 - Main structure					
	• Slewing/flange rings	DA	C	X ndt (5)	C	
	• Jib, crane house, platforms	DA	C	X ndt (5)	C	
	• Pedestal (not welded to the hull)	DA	C	X ndt (5)	C	
	• Load bearing shafts	DA	C	X ndt (5)	C	
	• Other load carrying structural elements	DA	C	X ndt (5)	C	
	• Fixed parts of lifting appliances and elements connecting them with the ship structure (6)	DA	C	X	C	
	2 - Mechanical elements					
	• Slewing ring bearing		C	X	C	
	• Bolts of slewing bearing		W		C	
	• Nuts of slewing bearing		W		W	

LIFTING APPLIANCES FOR SHIPS AND OFFSHORE UNITS - ITEM O						
No.	Item	Product certification				Remarks
		Design assessment / Approval	Raw material certificate	Examination and testing	Product certificate	
	3 - Machinery components and hydraulic systems (7)					(7) Refer to NR526, Ch 4, Sec 1, [3] and NR526, Ch 4, Sec 1, [4]
	• Winches	DA / TA	C	X	C	(8) Refer to item **G30**
	• Reduction gears (transmitted power P ≥ 110 kW)	DA / TA	W / C	X h ndt	C	(9) Refer to item **G28**
	• Reduction gears (transmitted power P < 110 kW)	DA / TA	W		W	(10) Refer to items **G26** / **G27**
	• Hydraulic accumulator (8)	DA / TA	W / C	X h ndt	W / C	(11) As per Society's agreement. Diesel engines to be type approved as marine engines. Survey requirements as per item **E1** and applicable provisions of NR467, Pt C, Ch 1, Sec 2.
	• Hydraulic cylinders class I	DA / TA	C	X h ndt	C	(12) Electrical motors and equipment to be considered as intended 'for essential services'. Survey requirements as per item **K**.
	• Hydraulic motors / pumps belonging to class I and II	DA / TA	W	X h ndt	C	(13) Refer to item **K5**
	• Hydraulic motors / pumps belonging to class III			X h	W	(14) Refer to item **K14**
	• Flexible hoses (9)	TA	W	X h	C	(15) Depending on SWL as per NR526, Ch 4, Sec 1, [3]
	• Piping system and fittings (10)		W / C	X h ndt	W / C	(16) For welded construction, the extent and the nature of the non-destructive examinations are subject to the Society's agreement. Refer to NR526, Ch 4, Sec 1, [4]
	• Auxiliary machinery items essential for the function of the lifting appliance	(11)	(11)	(11)	(11)	(17) Proof load as per NR526, Ch 4, Sec 1, [7]
	4 - Electrical equipment (12)					(18) As per NR216. As alternative, tests and checking carried out in compliance with international or national standards may be accepted if they are considered as equivalent (e.g. ISO 3178 "Steel wire ropes for general purposes - Terms of acceptance"). Refer to NR526, Ch 4, Sec 1, [5]
O3	• Electric motors for essential functions of the lifting appliance (13)	DA / TA		X	C / W	(19) As per NR216. Refer to NR526, Ch 4, Sec 1, [5]
	• Cables	DA / TA			W	
	• Circuit breakers	DA / TA			W	
	• Contactors	DA / TA			W	
	• Convertors	DA / TA		X	C	
	• Switchboard (14)	DA		X	C	
	• Slip rings	DA / TA		X	C	
	5 - Loose gear (Blocks, hooks, shackles …)	DA / TA	W / C (15)	X ndt (16) (17)	C	
	6 - Ropes					
	• Wire ropes		W	X (18)	C	
	• Fibre ropes		W	X (19)	C	

LIFTING APPLIANCES FOR SHIPS AND OFFSHORE UNITS - ITEM O						
No.	Item	Product certification				Remarks
		Design assessment / Approval	Raw material certificate	Examination and testing	Product certificate	
O4	Supply at Sea (SAS) components (1)					(1) Supply at Sea (SAS) components as per relevant provisions of NR467, Pt F, Ch 12, Sec 3. The additional class notation **SAS** is assigned in accordance with NR467, Pt A, Ch 1, Sec 2, [6.16.4], to ships having the service notation **supply** fitted with installations for underway ship-to-ship supply at sea of liquid and solid supplies, complying with the requirements of NR467, Pt F, Ch 12, Sec 3 (2) As per NR216 (3) As per relevant provisions of NR526 (4) As a rule, no individual design assessment of winches and RAS equipment. Also see remark (15) Replenishment at sea (RAS): as per definition, RAS means refuelling at sea or underway replenishment at sea of solid and liquid supplies (5) Considered as intended for secondary essential services. Also see relevant provisions of item **K5** (6) Testing of electric motors includes type tests and routine tests as per Pt C, Ch 2, Sec 4, [3] (7) Where nothing is mentioned in the design index assessment column, an individual design assessment of the specific unit is not required (or the unit DA is already addressed within the scope of the Main system approval). (8) Control and monitoring system, refer to the relevant provisions of items **K** and **N** (Automation systems) (9) Only for metallic pieces and couplings (10) Non-destructive and hydraulic tests as per recognized standards or specification to be specified by the manufacturer (11) Emergency breakaway capabilities to be demonstrated on-board (12) Only for elements not complying with a national or international standard (13) Proof load as per NR467, Pt F, Ch 12, Sec 3, [4.3] (14) Also see the corresponding requirements of item **O3**, as applicable (15) As per requirement of NR216 or in compliance with a national or international standard (ISO 3178 for instance) Note: Supply at Sea (SAS) arrangements tests and inspections required after their installation on board, according to an agreed programme -ref. NR467, Pt F, Ch 12, Sec 3, [4.4]
	1- Lifting appliances: masts, cranes, derricks	DA	C (2)	X (3)	C	
	2- Winches, anti-slack devices, Ram tensioner	(4)	C (2)	X	C	
	3- Electric motors and electrical equipment used for SAS operations (5)	DA or TA	W	X (6)	C / W (5)	
	4- Hydraulic cylinders, piping of class I and equipment essential for SAS operation (winches, Ram tensioner)	(7)	C	X h ndt	C	
	5- Control systems of winches and essential systems for SAS operation (Ram tensioner)	DA (8)		X	C	
	6- Cargo transfer hoses and pipes couplings, including breakaway couplings	TA	C (9)	X h ndt (10) (11)	C	
	7- Loose gear and accessories, including blocks, hooks, shackles, swivels …	DA (12)	W	X (13)	C	
	8- Steel wire ropes (14)	(7)	W	X (15)	C	

LIFTING APPLIANCES FOR SHIPS AND OFFSHORE UNITS - ITEM O						
No.	Item	Product certification				Remarks
		Design assessment / Approval	Raw material certificate	Examination and testing	Product certificate	
O5	Winches intended for lifting appliances (not documented with **O1**, **O2**, **O3** and **O4**), and subject to individual assessment	(1)	(2)	X ndt (3) (4)	C	(1) Scope to be specially considered by the Society and agreed on a case-by-case basis. Acceptance may be done by mean of specification data verifications and prototype testing according to NR526 (2) Materials as per NR216 (3) For welded construction. The extent and the nature of the non-destructive examinations are subject to the Society's agreement (4) Shop tests and running tests, as per agreed program (5) See the corresponding requirements of items **O2** or **O3**, as applicable (6) Survey to be done as per relevant requirements of the Rules: for piping and pressure vessels, see items **G26** and **G30**; for electrical equipment, see the corresponding requirements for items **O2** or **O3**, as applicable (7) Loose gear (if any), as per item **O2** or **O3** as applicable
	1- Main load carrying structural elements: drum, flanges, supports or baseplate, shaft, etc.		C	X	C	
	2- Ropes		W	X (5)	C	
	3- Hydraulic systems and other component essential for the function of the winch		C	X (6)	C	
	4- Loose gear and accessories		C	X (7)	C	

Item P - Container Lashing Equipment for Ships with Additional Class Notation LASHING

CONTAINER LASHING EQUIPMENT FOR SHIPS WITH ADDITIONAL CLASS NOTATION LASHING - ITEM P						
No.	Item	Product certification				Remarks
		Design assessment / Approval	Raw material certificate	Examination and testing	Product certificate	
P1	Cargo fixed lashing equipment (cell-guides, corner locking devices, steel wire ropes or chain lashing, steel rods …) and mobile lashing/securing equipment (1)					(1) As per NR467, Pt F, Ch 12, Sec 5 (2) As per NR216 (3) As per agreed procedures Note: On board. Running tests of mounting of mobile lashing equipment in accordance with the conditions of operation and the lashing plan arrangement are to be carried out
	1- Fixed lashing equipment (cell-guides, corner locking devices, steel wire ropes or chain lashing, steel rods, …)	DA	C (2)	X	W	
	2- Mobile lashing/securing equipment	TA (3)	C (2)	X (3)	C	

Item Q - Installations covered by Additional Class Notation SPM (SINGLE POINT MOORING)

INSTALLATIONS COVERED BY ADDITIONAL CLASS NOTATION SPM (SINGLE POINT MOORING) - ITEM Q						
No.	Item	Product certification				Remarks
		Design assessment / Approval	Raw material certificate	Examination and testing	Product certificate	
Q	Note: The following Note applies to all items, from **Q1** to **Q3**: The additional class notation **SPM** is assigned to ships fitted forward with equipment for mooring at single point mooring or single buoy mooring terminals, using standardized equipment complying with the recommendations of the Oil Companies International Marine Forum (OCIMF), 4th edition (2007), subject to the agreement. The application of other editions of OCIMF is considered by the Society on a case-by-case basis)					
Q1	Bow chain stoppers (1)	DA or TA	C (2)	X ndt (3)	C	(1) Components of the equipment used for mooring at single point moorings may be common with the bow emergency towing arrangements specified in item **B22**, provided that the provisions of NR467, Pt F, Ch 11, Sec 3 are complied with (2) As per NR216 (3) Testing as per agreed procedure
Q2	Bow fairleads	DA (1)	C (2)			(1) May be type approved (2) As per NR216
Q3	Pedestal roller fairleads	DA (1)	W	X	C	(1) May be type approved

Item R - Installations covered by Additional Class Notation DYNAPOS (Dynamic Positioning)

INSTALLATIONS COVERED BY ADDITIONAL CLASS NOTATION DYNAPOS (DYNAMIC POSITIONING) - ITEM R						
No.	Item	Product certification				Remarks
		Design assessment / Approval	Raw material certificate	Examination and testing	Product certificate	
R1	Control system, controllers, etc	DA (1) (2)		X (3)	C	(1) As per NR467, Pt F, Ch 11, Sec 5 (2) Automation systems: see relevant provisions of item **N** (3) According to an agreed program
R2	Position reference systems (gyrocompass, acoustic system, taut wire, radio location, inertial system, Doppler system, GPS, etc.)	DA or TA (1) (2)		X (3)	C	(1) DA as per NR467, Pt F, Ch 11, Sec 5 TA for other reference systems i.e. GPS or DGPS designed in accordance with IMO Resolutions (to be approved by a competent national Authority) (2) Automation systems: see relevant provisions of item **N** (3) According to an agreed program
R3	Vessel sensors (heading and motion, wind speed and direction)	(1)		X (2)	C	(1) Automation systems: see relevant provisions of item **N** (2) According to an agreed program
R4	Thruster system (1)	DA	C	X ndt	C	(1) See item **G34**
R5	Power system, electrical installations and their prime movers (1)	DA		X ndt	C / W (1)	(1) See item **K** and relevant provisions of items **E**, **F** and **G** (i.e. for diesel engines, turbines, etc.)

Item S - Pollution Prevention Installation covered by Additional Class Notations CLEANSHIP (CLEANSHIP, CLEANSHIP SUPER and other notations)

POLLUTION PREVENTION INSTALLATION COVERED BY ADDITIONAL CLASS NOTATION CLEANSHIP (CLEANSHIP, CLEANSHIP SUPER and other notations) - ITEM S						
No.	Item	Product certification				Remarks
		Design assessment / Approval	Raw material certificate	Examination and testing	Product certificate	
S1	15 ppm oil filtering equipment, oily water separators	(1) (2)		(1) (2)	(1) (2)	(1) Statutory equipment. Certification as per Flag State requirements for the concerned vessel applies and is to be submitted to the Society for vessels with additional class notations (2) Additional requirements as per Classification Rules are to be verified using Type approval (TA) or case-by-case Design assessment (DA). Surveys, as relevant
S2	Oil content meter	(1) (2)		(1) (2)	(1) (2)	(1) Statutory equipment. Certification as per Flag State requirements for the concerned vessel applies and is to be submitted to the Society for vessels with additional class notations (2) Additional requirements as per Classification Rules are to be verified using Type approval (TA) or case-by-case Design assessment (DA). Surveys, as relevant
S3	Sewage treatment plants	(1) (2)		(1) (2)	(1) (2)	(1) Statutory equipment. Certification as per Flag State requirements for the concerned vessel applies and is to be submitted to the Society for vessels with additional class notations (2) Additional requirements as per Classification Rules are to be verified using Type approval (TA) or case-by-case Design assessment (DA). Surveys, as relevant
S4	Shipboard incinerators	(1) (2)		(1) (2)	(1) (2)	(1) Statutory equipment. Certification as per Flag State requirements for the concerned vessel applies and is to be submitted to the Society for vessels with additional class notations (2) Additional requirements as per Classification Rules are to be verified using Type approval (TA) or case-by-case Design assessment (DA). Surveys, as relevant

POLLUTION PREVENTION INSTALLATION COVERED BY ADDITIONAL CLASS NOTATION CLEANSHIP (CLEANSHIP, CLEANSHIP SUPER and other notations) - ITEM S						
No.	Item	Product certification				Remarks
		Design assessment / Approval	Raw material certificate	Examination and testing	Product certificate	
S5	Scrubbers (1): - Water pumps (2) - Treatment chemical pumps (2) - Tower Unit (Scrubber) (2) - Pipes, valves and fittings (3) - Pressure vessels (4)	DA / TA (5) (6)	W	X ndt (2) (5) (6)	W / C (2) (5) (6)	(1) For SOx, i.e. Sulfur oxides (2) EGCS Tower Unit (Scrubber) and Treatment chemical pumps are to be certified - Product certificate 'C' as per requirements NR467, Pt.C, Ch.1, Sec.10. Table 41 (3) As per item **G29** (4) As per item **G30** (5) Statutory equipment. Certification as per Flag State requirements for the concerned vessel applies and is to be submitted to the Society for vessels with additional class notations (6) Additional requirements as per Classification Rules are to be verified using Type approval (TA) or case-by-case Design assessment (DA). Surveys, as relevant Note: Scrubber units to be designed and installed in accordance with applicable Statutory requirements and relevant provisions of NR467, Pt C, Ch 1, Sec 11 and NR216. See item **G26** and other relevant provisions of this NR266. Additional class notation **EGCS-SCRUBBER** as per NR467, Pt F, Ch 9, Sec 7, [2], as relevant
S6	SCR, Selective catalytic reduction systems (1) (2) - Pipes, valves and fittings (3) - Pressure vessels (4)	DA / TA (2) (5)	(W)	(2) (5)	C (2) (5)	(1) For NOx, i.e. nitrogen oxides (2) Statutory equipment. Certification as per Flag State requirements for the concerned vessel applies and is to be submitted to the Society for vessels with additional class notations (3) As per item **G29** (4) As per item **G30** (5) Additional requirements as per Classification Rules are to be verified using Type approval (TA) or case-by-case Design assessment (DA). Surveys, as relevant
S7	Ballast water management system (BWMS)	TA (1)	C / W (2)	X h (2)	C (2)	(1) Statutory equipment. Certification as per Flag State requirements for the concerned vessel applies and is to be submitted to the Society for vessels with additional class notations (2) Additional class requirements, see item **G44**

POLLUTION PREVENTION INSTALLATION COVERED BY ADDITIONAL CLASS NOTATION CLEANSHIP (CLEANSHIP, CLEANSHIP SUPER and other notations) - ITEM S						
No.	Item	Product certification				Remarks
		Design assessment / Approval	Raw material certificate	Examination and testing	Product certificate	
S8	Onboard NOx monitoring systems (1)	(2) (3)		(2) (3)	(2) (3)	(1) For NOx, i.e. nitrogen oxides (2) Statutory equipment. Certification as per Flag State requirements for the concerned vessel applies and is to be submitted to the Society for vessels with additional class notations (3) Additional requirements as per Classification Rules are to be verified using Type approval (TA) or case-by-case Design assessment (DA). Surveys, as relevant
S9	Grey Water Treatment Plant (1) (2)	TA	C / W (3)	X h ndt (4)	C	(1) For equipment covered by additional class notations **GWT** and **GWT-B** (2) Statutory equipment: certification as per Flag State requirements (3) As required in other relevant items of this NR266 (4) As required by NR467, Pt F, Ch 9, Sec 5

Item T - Availability of Machinery covered by Additional Class Notation AVM (AVM-APS, AVM-DPS, AVM-IPS)

AVAILABILITY OF MACHINERY COVERED BY ADDITIONAL CLASS NOTATION AVM (AVM-APS, AVM-DPS, AVM-IPS) - ITEM T						
No.	Item	Product certification				Remarks
		Design assessment / Approval	Raw material certificate	Examination and testing	Product certificate	
T1	The additional class notation **AVM-APS** is assigned to self propelled ships arranged with means for alternative propulsion system complying with NR467, Part F, Chapter 2	DA or TA (1)	C or W (1)	X (1)	C or W (1)	(1) Survey of components of the system to be done as per relevant Sections of NR467 and this NR266 for similar systems (2) At least one alternative propulsion system (capable of being brought into operation within 30 mn after the loss of the main propulsion system) (4) When electrical motor is used as alternative propulsion system, characteristics are to be appropriate for electrical propulsion (3) Electrical power plant so designed that in case of any failure in the plant, there remains enough electrical power to maintain simultaneously: sufficient propulsion and steering capability to operate the ship in safe conditions, and the availability of safety systems
	1- Alternative propulsion system (system that provides thrust of the ship in emergency conditions, when the main propulsion system becomes unavailable after a failure) (2) (3)	DA or TA (1) (4)	C or W (1)	X (1)	C or W (1)	
	2- Propulsion auxiliary systems associated to alternative propulsion system	DA or TA (1)	C or W (1)	X (1)	C or W (1)	
T2	The additional class notation **AVM-DPS** is assigned to ships arranged with redundant propulsion and steering installations complying with NR467, Part F, Chapter 2	DA or TA (1) (2)	C or W (1)	X (1)	C or W (1)	(1) Survey of components of the system to be done as per relevant Sections of NR467 and this NR266 for similar systems (2) Electrical power plant so designed that in case of any failure in the plant, there remains enough electrical power to maintain simultaneously: sufficient propulsion and steering capability to operate the ship in safe conditions, and the availability of safety systems
T3	The additional class notation **AVM-IPS** is assigned to ships arranged with independent propulsion and steering installations complying with NR467, Part F, Chapter 2	DA or TA (1) (2)	C or W (1)	X (1)	C or W (1)	(1) Survey of components of the system to be done as per relevant Sections of NR467 and this NR266 for similar systems (2) In addition, in the event of fire or flooding casualty in the machinery spaces, the propulsion, steering and power generation capabilities are to remain sufficient to operate the ship in safe conditions. Where a propulsion system becomes inoperative due to a fire or flooding casualty, other propulsion systems are not to be affected by the casualty
	- Propulsion auxiliary systems, and electrical generation and electrical distribution equipment	DA (2)	C or W (1)	X (1)	C or W (1)	

Item U - Stainless or high alloy steel for membrane of liquefied gas fuel ships

LNG FUEL HANDLING AND CONTAINMENT SYSTEMS OF GAS FUEL SHIPS - ITEM U						
No.	Item	Product certification				Remarks
		Design assessment/ approval	Raw material certificate	Examination and testing	Product certificate	
U1	Steel plates and profiles for independent liquefied gas fuel tanks	(1)	C (1)	X	C	(1) As per provisions of NR529, Chapter 7 and NR529, Chapter 16
U2	Aluminium alloy plates and profiles for independent liquefied gas fuel tanks	(1)	C (1)	X	C	(1) As per provisions of NR529, Chapter 7 and NR529, Chapter 16
U3	Stainless or high alloy steel for membrane liquefied gas fuelled ships	(1) TA (2)	C (1) (2)	X	C	(1) As per provisions of NR529, Chapter 7 and NR529, Chapter 16 (2) Provisions of NR529, Appendix 2 are to be applied and relevant provisions of NR216 and NR480 Note: Contacts of gas fuel tanks to supporting blocks to be checked on board
U4	Insulation materials (1)					(1) Refer to NR529 C.6.4.13.3 and NR529, C.6.4.13.3 (a) (2) Test to be witnessed by attending surveyors unless otherwise agreed (3) DA for glue not used in secondary barrier (SB) or inner space (IP) bonding (4) Tensile tests for TA (5) C for polyurethane foam, W for polystyrene (6) Review of bonders operators qualifications Review of bonding and other fabrication or testing qualifications including Flat, Corner and Tri-way panels
	1 - Paint for inner hull protection	TA			W	
	2 - Studs, nuts, washers, coupler sockets, staples and screws		W		W	
	3 - Load bearing mastic	TA (2)		X	W	
	4 - Adhesives and Glue	TA (3) (4)			W	
	5 - Foam panel	TA			C/W (5)	
	6 - Plywood	TA			W	
	7 - Stainless steel sheet	TA		X	C	
	8 - Stainless steel sheet studs, nuts and washers	DA			C	
	9 - Glass wool and Glass cloth	TA			W	
	10 - Thermal protection				W	
	11 - Aluminium for reinforced elements	TA		X	C	
	12 - Aluminium wedges	TA	C		W	
	13 -Secondary Barrier (composite material)	TA		X	C	
	14 - Insulating Panels	TA	C	X (6)	C	

LNG FUEL HANDLING AND CONTAINMENT SYSTEMS OF GAS FUEL SHIPS - ITEM U						
No.	Item	Product certification				Remarks
		Design assessment/ approval	Raw material certificate	Examination and testing	Product certificate	
U4	15 - Expansion Rivets (15 mm)	TA	W		W	(7) In the case of shipbuilder's own manufacturing, no certificate would be issued after inspection unless explicitly required
	16 - Stainless Steel corners and Anchor Strips	TA	C	X	C	
	17 - Primary barrier component	DA	C	X	C	
	18 - Single Legs	DA	W	X	C	
	19 - Primary Block Assembly	DA	W		C	
	20 - Perlite	TA			W	
	21 - Insulating Material Flexible / Rigid	TA			W	
	22 - Fe-Ni alloy (36% Nickel) strips	TA		X	C	
	23 - Anti-sticking film				W	
	24 - Insulating Boxes	DA	W		W	
	25 - Fe-Ni (36% Nickel) welding filler metal	TA		X	C	
	26 - Densified wood laminated for pipe guide tower	DA	C		C (7)	
U5	Gas fuel compressors and their prime movers					(1) As per provisions of NR529 (2) Cryogenic compressors - Product certificate (C) required for materials in contact with the fuel gas, both the pressure containing parts, and non-pressure containing components (shaft and impellers) (3) According to an agreed program (4) For electrical motors, refer to item **K**
	• Gas fuel compressors	TA or DA (1)	C (1) (2)	X h (3)	C	
	• Prime movers (4)	(4)		X (4)	C	
U6	Gas fuel pumps and their prime movers					(1) As per provisions of NR529 (2) Cryogenic pumps - Product certificate (C) required for materials in contact with the fuel gas: both the pressure containing parts, and non-pressure containing components (shaft and impellers) (3) According to an agreed program (4) For electrical motors, refer to item **K**
	• Gas fuel pumps	TA or DA (1)	C (1) (2)	X h (3)	C	
	• Prime movers (4)	(4)	(4)	(4)	C	

LNG FUEL HANDLING AND CONTAINMENT SYSTEMS OF GAS FUEL SHIPS - ITEM U						
No.	Item	Product certification				Remarks
		Design assessment/ approval	Raw material certificate	Examination and testing	Product certificate	
U7	Bulkhead seal and gastight shaft bulkhead penetration devices	DA or TA (1)		X h	C (2)	(1) As per NR529 - Part A-1, C9(a) (2) As per conditions set in the TA
U8	Fans for hazardous enclosed spaces, and their prime movers					(1) Concerns the anti-sparking fans (2) As per conditions set in the TA (3) For electrical motors, refer to item **K**
	• Fans	TA (1)		X	C / W (2)	
	• Prime movers (3)	(3)		X (3)	C	
U9	Condensers, gasifiers or vaporizers, separators, heat exchangers, receivers, process pressure vessels, or other similar apparatus of gas fuel supply system	DA (1)	C (1)	X h ndt	C	(1) As per provisions of NR529, Chapter 7. process pressure vessels handling cargo are to be considered as Class I pressure vessels, in accordance with NR467, Pt C, Ch 1, Sec 3, [1.4.1] Note: Running tests - during gas trials of the ship
U10	Fuel pipes for liquefied gas fuel					(1) As per provisions of NR529 and NR467, Pt C, Ch 1, Sec 10 (2) Non-destructive testing: in addition to normal controls before and during the welding, and to the visual inspection of the finished welds, as necessary for proving that the welding has been carried out correctly and according to the regulations in this paragraph, radiographic or ultrasonic inspection or other non-destructive tests shall be carried out as required by NR529, Chapter 16, [16.6.3] (3) W for Seamless steel or stainless steel, C for longitudinally welded stainless steel pipes
	• nominal diameter ND ≥ 50mm		C	X h ndt (1) (2)	C	
	• nominal diameter ND < 50mm		W	X h ndt (1) (2)	C / W (3)	
U11	Fuel pipes for gaseous gas fuel with design pressure equal or lower than 10 bar (Class I or Class II)					(1) As per provisions of NR529 and NR467, Pt C, Ch 1, Sec 10 (2) Non-destructive testing: in addition to normal controls before and during the welding, and to the visual inspection of the finished welds, as necessary for proving that the welding has been carried out correctly and according to the regulations in this paragraph, radiographic or ultrasonic inspection or other non-destructive tests shall be carried out as required by NR529, Chapter 16, [16.6.3] (3) W for Seamless steel or stainless steel, C for longitudinally welded stainless steel pipes
	• **Class I**: pipes in single wall configuration, and nominal diameter ND ≥ 50mm • **Class II**: pipes in double wall configuration, and nominal diameter ND ≥ 100mm		C	X h ndt (1) (2)	C	
	• **Class I**: pipes in single wall configuration, and nominal diameter ND < 50mm • **Class II**: pipes in double wall configuration, and nominal diameter ND < 100mm		W	X h ndt (1) (2)	W / C (3)	

LNG FUEL HANDLING AND CONTAINMENT SYSTEMS OF GAS FUEL SHIPS - ITEM U						
No.	Item	Product certification				Remarks
		Design assessment/ approval	Raw material certificate	Examination and testing	Product certificate	
U12	Fuel pipes for gaseous gas fuel with design pressure higher than 10 bar (Class I) (1)					(1) For both single and double wall configuration (2) As per provisions of NR529 and NR467, Pt C, Ch 1, Sec 10 (3) Non-destructive testing: in addition to normal controls before and during the welding, and to the visual inspection of the finished welds, as necessary for proving that the welding has been carried out correctly and according to the regulations in this paragraph, radiographic or ultrasonic inspection or other non-destructive tests shall be carried out as required by NR529, Chapter 16, [16.6.3] (4) W for Seamless steel or stainless steel, C for longitudinally welded stainless steel pipes
	• nominal diameter ND ≥ 50mm		C	X h ndt (2) (3)	C	
	• nominal diameter ND < 50mm		W	X h ndt (2) (3)	W / C (4)	
U13	Outer pipe of double wall fuel pipes (Class II) (1)					(1) As per provisions of NR529 and NR467, Pt C, Ch 1, Sec 10 (2) W for Seamless steel or stainless steel, C for longitudinally welded stainless steel pipes
	• nominal diameter ND ≥ 100mm		C	X h ndt	C	
	• nominal diameter ND < 100mm		W	X h ndt	W / C (2)	
U14	Gas fuel pipe fittings (1)	DA (2)	C / W (3)	X h ndt (4)	C	(1) Such as elbows, reducers, flanges: same remarks as for items **U10**, **U11**, **U12** or **U13**, as appropriate (2) If not already addressed within the scope of the system approval (3) Material certificate as for items **U10**, **U11**, **U12** or **U13** depending on the pipe type (4) When the fittings are of welded type, the welding procedures are to be examined
U15	Expansion joints (1)	TA	C (2)	X h ndt	C	(1) Specific requirements as per NR529 (2) Refer to Items **U10**, **U11**, **U12** or **U13** as appropriate
U16	Expansion bellows (1)	TA (2)	C (3)	X h ndt	C	(1) Specific requirements as per NR529, Chapter 16, [16.7.2] (2) Prototype tests to be performed on each type of expansion bellows intended for use on gas fuel piping, primarily on those used outside the gas fuel tank (3) Refer to Items **U10**, **U11**, **U12** or **U13** as appropriate
U17	Liquefied gas bunkering hoses (1)	TA (2)	C	X h ndt	C	(1) Specific requirements as per NR529, Chapter 8 (2) Refer also to NR620

LNG FUEL HANDLING AND CONTAINMENT SYSTEMS OF GAS FUEL SHIPS - ITEM U						
No.	Item	Product certification				Remarks
		Design assessment/ approval	Raw material certificate	Examination and testing	Product certificate	
U18	Gas fuel valves (1)					(1) Class of piping as per provisions of NR529, Chapter 7 (2) Index TA for service temperature < –55°C Index DA for service temperature ≥ –55°C (3) Prototype testing as per NR529, Chapter 16 (4) As per NR216, Ch 5, Sec 7, [1.8]. Non-destructive examination by both MPI and UT methods are to be carried out on all Class I drum-forgings having thickness > 10 mm, intended for Class I piping systems, typically: all valves of large size (having nominal diameter ≥ 24") (5) In case of welded construction. When the valves have welded elements, the welding procedures are to be examined (6) Unit production testing: all valves are to be tested as per NR529, Ch16
	• nominal diameter ND ≥ 50mm	TA or DA (2) (3)	C (4)	X h ndt (5) (6)	C	
	• nominal diameter ND < 50mm	TA or DA (2) (3)	W (4)	X h ndt (5) (6)	C	
U19	Safety relief valves for gas fuel piping system	TA or DA (1)	C	X h ndt (2) (3)	C	(1) TA, or case-by-case DA (2) Checking of the setting (3) When the valves have welded elements, the welding procedures are to be examined
U20	Safety relief valves for gas fuel tanks	TA (1)	C	X h ndt (2) (3)	C	(1) The approval includes capacity testing (2) Checking of the setting including tightness test (3) When the valves have welded elements, the welding procedures are to be examined
U21	Gas fuel process and containment sensors, transmitters, flow meters, PT100 and PLC, Circuit breakers, Electric cables	TA (1)		X	C / W (2)	(1) For some equipment, DA is applicable on a case-by-case basis; see item K and relevant provisions of item **N** and NR529 (2) As per conditions set in the TA
U22	Vent lines on gas fuel tanks and low pressure gas fuel system (1)	DA	W	X h ndt (2)	C	(1) Open-ended lines (the design pressure should be not less than 5 bar gauge) (2) In case of welded construction. When the vent lines have welded elements, the welding procedures are to be examined
U23	Vent lines on high pressure gas fuel system (1)	DA	C / W (2)	X h ndt (3)	C	(1) The design pressure of the vent pipe is not to be less than the maximum expected pressure, which is to be justified (2) Depending on the class of piping as per NR529, Table C7.3(a) (3) In case of welded construction. When the vent lines have welded elements, the welding procedures are to be examined
U24	Inert gas generation systems (1)					(1) See item **D**

LNG FUEL HANDLING AND CONTAINMENT SYSTEMS OF GAS FUEL SHIPS - ITEM U						
No.	Item	Product certification				Remarks
		Design assessment/ approval	Raw material certificate	Examination and testing	Product certificate	
U25	Fire prevention materials and arrangements (1)					(1) See item **C** and relevant provisions of NR529
U26	Fire fighting systems (1)					(1) See item **C** and relevant provisions of NR529
U27	Gas detection system	TA (1)		X	C	(1) Automation systems: see relevant provisions of item **N**
U28	Integrated gas fuel supply system (1)	DA		X (2)	C	(1) Complete system including fuel containment, tank connection space and gas preparation system (2) As per agreed program, based on the requirements of NR529, IGF Code and/or standards recognized by the Society
U29	Boil-Off Gas (BOG) handling system, as part of refrigeration / reliquefaction systems (1)	TA or DA		X (2)	C	(1) See relevant provisions of NR529, [6.9] (2) As per agreed program, based on the requirements of IGF Code and/or standards recognized by the Society
U30	Gas valve unit (1)	TA or DA		X (2)	C	(1) See relevant provisions of NR529 (2) As per agreed program, based on the requirements of IGF Code and/or standards recognized by the Society
U31	Gas combustion unit (1)	TA or DA		X (2)	C	(1) See relevant provisions of NR529 (2) As per agreed program, based on the requirements of IGF Code and/or standards recognized by the Society
U32	Independent fuel tank supporting materials	TA (1)	C (1)	X	C	(1) As per provisions of NR467, Part D, Chapter 9 and relevant provisions of NR216 and NR480 Note 1: Contacts of tanks to supporting blocks to be checked on board Note 2: Also see relevant provisions of NR529
U33	Pump tower (fuel piping and supporting structure)	DA	W/C (1)	X h (2) ndt (3)	C (2)	(1) C for fuel piping, W for supporting structure (2) For cargo piping, See **U10** to **U14** (3) Review of welders, and NDT operators qualifications. Review of welding, NDT and other fabrication or testing qualifications. Survey of the fabrication and witnessing of NDT at random.

LNG FUEL HANDLING AND CONTAINMENT SYSTEMS OF GAS FUEL SHIPS - ITEM U						
No.	Item	Product certification				Remarks
		Design assessment/ approval	Raw material certificate	Examination and testing	Product certificate	
U34	Pump tower base support	DA	C	X ndt (1)	C	(1) Review of welders, and NDT operators qualifications. Review of welding, NDT and other fabrication or testing qualifications (in particular - gas tracer/leak test). Survey of the fabrication and witnessing of NDT at random.
U35	Dome cover	DA	C	X ndt (1) (2)	C (2)	(1) Review of welders, and NDT operators qualifications. Review of welding, NDT and other fabrication or testing qualifications (in particular - gas tracer/leak test). Survey of the fabrication and witnessing of NDT at random. (2) For fuel piping, See **U10** to **U14**.
U36	Dome seat	DA	C	X ndt (1) (2)	C	(1) Review of welders, and NDT operators qualifications. Review of welding, NDT and other fabrication or testing qualifications Survey of the fabrication and witnessing of NDT at random.
U37	Sump well	DA	C	X ndt (1) (2)	C	(1) Review of welders, and NDT operators qualifications. Review of welding, NDT and other fabrication or testing qualifications (in particular - gas tracer/leak test). Survey of the fabrication and witnessing of NDT at random.
U38	Independent cargo tank systems	DA (1)	C / W (1)	X ndt	C	(1) As per provisions of NR467, IGC Code and IGF Code

Item V - Integrated Communication, Monitoring and Digital Systems

INTEGRATED COMMUNICATION, MONITORING AND DIGITAL SYSTEMS - ITEM V						
No.	Item	Product certification				Remarks
		Design assessment / Approval	Raw material certificate	Examination and testing	Product certificate	
V1	Bridge communication systems covered by additional class notation **SYS-IBS**					(1) See NR467, Pt F, Ch 4, Sec 2
	1- Integrated bridge navigation systems	TA (1)			C	
	2- Controlled network equipment / systems	TA (1)			C	
V2	Ship-shore communication systems covered by additional class notation **ASYNC-COM**					(1) See NR467, Pt F, Ch 4, Sec 3 (2) As per conditions set in the Type Approval (TA)
	1- Communication software	TA (1)			C	
	2- Components	TA or DA (1)			C (2)	
V3	Computer based systems covered by additional class notation **CII-REALTIME**	TA (1)				(1) See NR467, Pt F, Ch 5, Sec 3. A Type Approval (TA) is required for CII ODS and for CII SDS.
V4	Data infrastructures covered by additional class notation **DATA-INFRA**					(1) As per NR467 Pt C, Ch 2, Sec 15
	1- Acquisition LAN device	TA (1)				
	2- Data logger	TA (1)				
V5	Smart systems covered by additional class notations **SMART** (1)					(1) See NR675 (2) As per NR467 Pt C, Ch 3, Sec 6 (3) As per NR467, Pt C, Ch 2, Sec 15
	1- Hardware	TA (2)				
	2- Components	TA or DA (3)				

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