

**VERITAS REGISTER OF SHIPPING**

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**RULES FOR THE CLASSIFICATION AND  
CONSTRUCTION OF SEAGOING SHIPS**

**Part I  
Classification**



**BATUMI 2024**

Veritas Register of Shipping Ltd

## **Rules for classification and construction of seagoing ships**

### **Part I "Classification"**

These Rules developed on the basis of the Rules for classifications and constructions of seagoing ships on Ukrainian Register of Shipping with taking into account the experience of their application, changes in the applicable International conventions, Codes and Resolutions adopted by the International Maritime organization (IMO) with applicable amendments and changes in the applied resolutions of the United Nations Economic Commission for Europe and directives of the European Parliament and Council.

Rules for classification and construction of sea-going ships consist of following parts:

#### **Part I Classification**

Part II "Hull";

Part III "Equipment, Arrangements and Outfit";

Part IV "Stability";

Part V "Subdivision";

Part VI "Fire Protection";

Part VII "Machinery Installations";

Part VIII "Systems and Piping";

Part IX "Machinery";

Part X "Boilers, Heat Exchangers and Pressure Vessels";

Part XI "Electrical Equipment";

Part XII "Refrigerating Plants";

Part XIII "Materials";

Part XIV "Welding";

Part XV "Automation";

Part XVI "Structure and Strength of Fiber-Reinforced Plastic Ships";

Documents have been approved in accordance with the established approval procedure and come into force on 1<sup>st</sup> July of 2024.

The Rules are published in English. Official version of Rules for classifications and constructions of seagoing ships located on the official web site of Veritas Register of Shipping on the link <https://vrsclass.com/>

Official edition of the Veritas Register of Shipping

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## **PART I. CLASSIFICATION**

### **1. GENERAL**

#### **1.1 Rules**

**1.1.1** The basis for classification and construction of vessels and other floating structures and technical devices that belong to them are:

- Rules for classification and survey of seagoing ships of the Veritas Register of Shipping, further the Register, applied in each case edition and

- Rules of construction relating to that ship, taking into account the type or the appropriate device in the edition in force at the time of approval of the ship's project by the Register or signing a contract for its construction as follows:

- Newly published rules and amendments thereto come into force on the date stated in the annotation on the back of the title page. Before that date they shall be considered a recommendation.

- For newly built ships and offshore installations (hereinafter referred to as "the ships"), the rules and amendments thereto in effect on the date of signing the contract for construction of a ship (a series of ships) are generally applied.

- If the ship design is submitted to the Register for approval before the date of signing the contract for construction, the rules and amendments thereto in effect on the date of the customer's request for the design review are applied. In this case, if the new rules or amendments to the rules according to which the ship design was approved, have become effective on the date of signing the contract for construction of the ship, its design shall be updated to comply with the above rules or amendments.

**1.1.2** In this Part of the Rules for Classification and Construction of Sea-Going Ships under classification should understand the development, publication and application of the Rules, the permanent implementation of which, with proper maintenance of the vessel by the ship owner or operator will provide:

structural strength and integrity of the hull and its parts, including structural fire protection,

seaworthiness of the vessel (her stability) in all cases provided for under certain workload windwave conditions,

safe and reliable operation of its propulsive installation systems and ship control devices, other systems, auxiliary machinery and equipment, including fire-fighting, and thus will safely operate the vessel in accordance with her purpose.

**1.1.3** For special types of ships, namely: gas carriers, chemical carriers, high-speed craft, type A wip planes, mobile offshore drilling units, as well as for fixed offshore platforms (FOPs) and manned submersibles and ship's diving systems, the provisions of this part apply in accordance with the requirements of the Rules for classification and construction of these ships and FOPs.

**1.1.4** National rules such as the State Flag, remain intact relatively to Rules of classification. Various established in international agreements, requirements captured in the Rules (refer to the General Survey Regulations). In case of differences between the requirements of the Rules and international agreements priority for vessels that have to comply with international agreements is provided to these agreements if these requirements do not lower the safety level stipulated by the Rules.

## 1.2 DEFINITIONS AND EXPLANATIONS

### 1.2.1 Definitions

**1.2.1.1** For the purpose of the Rules for the Classification and Construction of Sea-Going Ships the following definitions and explanations have been adopted (unless expressly provided otherwise in particular Parts of the Rules):

*Antique or historic ship* - a ship that, taking into account its service life, its technical characteristics or design, its rarity, its importance for the storage of traditional principles of navigation or inland navigation methods or its significance from the point of view of a given historical era, deserves to be preserved, and is exploited primarily for ostentatious purposes or in the form of an exact copy

A *barge* is a non-self propelled cargo ship designed to be towed or pushed.

A *barge carrier (lighter carrier)* is a dry cargo ship carrying cargo in shipborne barges (lighters).

A *tug* is a ship specially intended for the towage and pushing of other ships and floating facilities.

*Displacement of a light ship* means the displacement of a ship without cargo, fuel oil, lubricating oil, ballast, fresh and boiler feed water in its tanks, provisions, consumable stores, and also without passengers, crew and their effects.

A *cargo ship* is any ship which is not a passenger ship (dry cargo ship, tanker, refrigerating transport ship, icebreaker, tug, pusher, salvage ship, vessel of dredging fleet, cable layer, special purpose ship and other non-passenger ship).

*Cargo - passenger ship* is a cargo ship, which is additionally equipped for transportation or carrying more than 12 passengers, including persons accompanying the present load. Cargo passenger ship shall meet the applicable integrated requirements for cargo and passenger vessels.

*Offshore industrial activities* are the construction, maintenance, operation or servicing of offshore facilities related, but not limited, to exploration, the renewable or hydrocarbon energy sectors, aquaculture, ocean mining or similar activities.

*Dump-scow* is a self-propelled or non-self-propelled ship designed for transporting spoil.

*Deadweight* means the difference between the displacement of a ship at the load waterline corresponding to the summer freeboard assigned for the water with a density of 1,025 t/m<sup>3</sup> and the displacement of a light ship. Ships intended solely for navigation in areas with fresh water, displacement of the ship by cargo waterline accepted for waterline corresponding to designated freeboard for the area of navigation, stated in the class of the vessel, in water with a specific gravity of 1.0 t/m<sup>3</sup>.

*Crew* means all available on board individuals who provide navigation and maintenance of the vessel, her machinery, systems and appliances necessary for propulsion and safe navigation of the ship, or serving persons on board.

*Crew of a fishing vessel* means persons engaged in any business on board a ship connected with its purpose.

*Industrial personnel* means all persons who are transported or accommodated on board for the purpose of offshore industrial activities performed on board other vessels and/or other offshore facilities and meet the criteria set out below.

Such industrial personnel should not be considered or treated as passengers.

For the purpose of these Interim Recommendations, all industrial personnel should:

**.1** be not less than 16 years of age;

**.2** prior to boarding the ship, receive appropriate safety training, meeting the standard in paragraph 2.1 of section A-VI/1 of the STCW Code. Administrations may accept other industrial training standards such as those of the Global Wind Organisation (GWO), Offshore Petroleum Industry Training Organisation (OPITO), Basic Offshore Safety

Induction and Emergency Training (OPITO accredited), if they consider these appropriate alternatives;

**.3** receive on board ship specific safety familiarization that includes, but is not limited to, the layout of the ship, and handling of the safety equipment, as appropriate. The standard in paragraph 1 of section A-VI/1 of the STCW Code, or equivalent, should be used as the standard;

**.4** be familiarized with specific procedures, e.g. transfer procedures on and off the ship while at sea, as appropriate;

**.5.1** be accounted for in the ship's life-saving equipment; and

**.5.2** be equipped with personal protective clothing and equipment suitable for the safety risks to be encountered both while on board the ship and being transferred at sea; and

**.6** meet appropriate medical standards. The standard in section A-I/9 of the STCW Code, applicable to engineers, or equivalent, may be used as a standard.

IMO guidance (MSC-MEPC.7/Circ.10) or relevant industry standards should be taken into account, to the extent possible, when transferring industrial personnel at sea.

A *dredger* is a self-propelled or non-self-propelled ship intended for extraction of spoil using dredging gear (buckets, suction pipes, grabs, etc.) and having no holds for the storage or carriage of spoil.

A *combination carrier* is a ship intended for the carriage of crude oil and petroleum products in bulk, as well as bulk cargoes (by these ships are meant ore/oil carriers, oil/bulk dry cargo carriers and similar ships).

*Commercial carriage of passengers* means boat trips, excursions, tourism, cruises, regular and irregular voyages between berths or ports, the operation of a ship in at berth and other types of commercial operation of a ship with passengers on board, carried out on the basis of a license obtained for the carriage of passengers by water transport in accordance with current legislation.

Seagoing non-passenger vessel (pleasure, voyage, etc.) intended for the carriage of passengers may be used for the commercial carriage of passengers provided that its equipment complies with the requirements of the SGS Rules for passenger ships. At the same time, accounting for the established number of passengers (people) on the ship is the subject of special consideration by the Register..

A *container ship* is a ship intended for the carriage of goods in containers of the international standard and provided with the cellular guides in the holds.

*Container carrier* is a ship, which is not a container ship, but is intended for the carriage of goods in containers of the international standard

*Copy of an antique or historic ship* - a ship which is constructed in the form of a corresponding traditional ship using mainly source materials and appropriate construction methods and on the basis of appropriate plans or models.

A *crane ship* is a construction similar to the floating crane, but on a floating hull with ship lines or lines of a similar shape.

An *icebreaker* is a self-propelled ship intended for various types of icebreaking operations to maintain navigation in the freezing seas (for details refer to **2.2.3.1.1**).

A *timber carrier* is a dry cargo ship intended for the carriage of deck timber cargo.

A *small craft* is a ship with length up to 20 m.

*Place of refuge* is any naturally or artificially sheltered aquatorium which may be used as a shelter by a ship under conditions likely to endanger the safety of the ship.

*Sea-going ship* is a ship which by her technical characteristics suitable and duly admitted to operation with a view of sea navigation on waterways and classified in accordance with the Rules for classification and construction of sea ships;



A *bulk carrier* is a ship which is intended primarily to carry dry cargoes in bulk, including such types as ore carriers and combination carriers.

To apply the term "bulk carrier" correctly, one should be guided by the provisions of IMO resolution MSC.277(85). The term "bulk carrier" is interpreted with the understanding under this definition as follows:

- primarily to carry dry cargo in bulk. means primarily designed to carry dry cargoes in bulk and to transport cargoes which are carried, and loaded or discharged, in bulk, and which occupy the ship's cargo spaces exclusively or predominantly; and

- includes such types as ore carriers and combination carriers and constructed generally with single deck, top-side tanks and hopper side tanks in cargo spaces. means that ships are not considered outside the definition of bulk carriers on the grounds that they are not ore or combination carriers or that they lack some or all of the specified constructional features.

- For ships built before 1 July 2006, the following interpretation of the definition of "bulk vessel" has been adopted :

- A ship which design includes one deck, side tanks and side bilge tanks in cargo spaces and which is intended mainly for transportation of bulk cargoes; or

- Ore carrier; or

- Combined ship.

For this "ore carrier" means sea single-deck ship having two longitudinal bulkheads and double bottom area along the length of the cargo spaces for the carriage of ore only in the central compartment; "Combined ship" means a tanker designed to carry oil or dry bulk cargoes in bulk.

A *roll-on/roll-off ship* is a ship specially designed for transportation of various wheeled vehicles (cars, rolling stock, tracked vehicles, trailers with and without cargo), in which the cargo loading operations are performed preferably in a horizontal direction - by a roll-on/roll-off.

A *docklift ship* is a dry cargo ship adapted to carry out cargo handling operations using the docking principle in ports and protected water areas.

A *tanker* is a ship intended for the carriage of liquid cargoes in bulk, including:

a *special tanker* is a ship intended for the bulk carriage of liquid cargoes other than oil and petroleum products. The precise purpose of the special tanker is stated by the descriptive notation in the class notation in accordance with **2.2.37**;

*an oil tanker* is a ship intended for the carriage in bulk of crude oil and petroleum products having a flash point 60°C and below for sea-going ships, with Reid vapour pressure being below atmospheric pressure;

*an oil tanker (>60°C)* is a sea-going ship intended for the carriage of petroleum products having a flash point over 60°C in bulk;

*an oil recovery ship* is a ship intended for recovery of crude oil and petroleum products having a flash point of 60°C or below from the sea surface;

*an oil recovery ship (>60°C)* is a ship intended for recovery of crude oil and petroleum products having a flash point above 60°C from the sea surface;

a *bilge water removing ship* is a ship designed to remove the bilge water from the machinery spaces of ships.

A *passenger* is every person other than the master and the members of the crew or other persons employed or engaged in any capacity on board a ship (special personnel) on the business of that ship, and a child under one year of age.

A *passenger ship* is a ship intended for or carrying more than 12 passengers.

A *roll-on/roll-off passenger ship (ro-ro passenger ship)* is a passenger ship with enclosed or open cargo spaces which are loaded/unloaded in a horizontal direction, or with special category spaces as defined in **1.5.4.3-1.5.4.4** and **1.5.9**, Part VI "Fire Protection"

of the Rules for the classification and construction of sea-going ships.

Classed among passenger ro-ro ships are also ferries, i.e. ships loaded/unloaded in the horizontal direction which regularly carry passengers and which carry vehicles with fuel in their tanks and/or railway carriages on open and/or enclosed decks at ferry crossing.

*A berth-connected passenger ship* means a berth-connected ship used as a floating hotel or hostel, floating restaurant (bar, café, casino, disco, games room), berthing pontoon, floating jetty, a boat for training of specialists and crew of ships or other purposes with the provided accommodation of more than 12 passengers on vessel.

*Patrol ship* means a ship used by surveillance, police, customs, rescue and other government services.

*Floating craft* is either self-propelled or non-self-propelled floating object, including stationary, that is used to carry cargo, baggage and mail, passengers, fish or other marine or river craft, rescue people, towing other floating objects, hydraulic engineering, scientific, educational, sports, entertainment purposes, and is operated on water.

*A floating crane* is a crane structure on a floating hull of pontoon or similar type, which is intended for cargo handling or other working operations (mounting, undersea, hydraulic engineering, salvage, pipe laying, etc.) and may be also used for the carriage of cargoes on deck and/or in the hold.

*A lightship* is a non-self-propelled ship having special equipment (light appliances, fog signaling arrangements, radar beacons, etc.) intended for bounding navigational hazards and ships orientation to ensure safety of navigation.

*Pleasure craft* is a ship, used on a non-commercial basis solely for recreation and has on board not more than 12 people.

*A fishing vessel* is a vessel used directly for catching or for catching and processing the catch (fish, whales, seals, walrus or other living resources of the sea).

*Crew boat* is a self-propelled vessel designed and equipped for transportation and travelling of officials or ship's crew in quantity not exceeding 12 people, excluding crew.

*An ore carrier* is a ship primarily designed for the carriage of ore, the structure of which includes longitudinal bulkheads separating the central double bottom ore hatches from the side one.

*A salvage ship* is a self-propelled ship intended for rendering assistance to ships in distress at sea.

*Special personnel* all persons who are not passengers or crew members or children not older than one year and who are on board in connection with the special purpose of the ship or in connection with special work on board this ship, that is perform special responsibilities related to specific operational purpose of the vessel, which are prescribed and over the number of staff required to perform regular duties relating to navigation, operation and maintenance of vessel mechanisms or employed in services of people on board. Wherever in these Rules the number of special personnel appears as a parameter, it should include the number of passengers carried on board which may not exceed 12. In the presence on board of more than 12 passengers, the ship is considered as a passenger vessel.

. Special personnel include the following:

- scientists, technicians and expeditionaries on ships engaged in research, non-commercial expeditions and survey;
- personnel engaged in training and practical marine experience to develop seafaring skills suitable for a professional career at sea. Such training should take place in accordance with the training program approved by the Administration;
- personnel who process the catch of fish, whales or other living resources of the sea on factory ships not engaged in catching;

- salvage personnel on salvage ships, cable-laying personnel on cable-laying ships, seismic personnel on seismic survey ships, diving personnel on diving support ships, pipe-laying personnel on pipe layers and crane operating personnel on floating cranes and crane ships;
- other personnel similar to those referred to above who, in the opinion of the Flag State Maritime Administration, may be referred to this group.

Where a ship is used for special purposes, such as providing diving operations or conducting oceanographic research, the persons on board in connection with these special purposes should be treated as special personnel.

*A berth-connected ship* is a ship or floating facility, which is in operation when lying at a water area distanced from the shore or aground or when moored at quay. These ships include floating docks, floating hotels and hostels, floating workshops, floating power plants, floating warehouses, floating oil storages, etc.

*A ship means a self-propelled or not self-propelled floating structure that is used for navigation in sea areas and / or inland waterways that meet her class.*

*Personnel ship* is a ship intended for the carriage of industrial personnel.

*A shipborne barge (lighter)* is a non-self-propelled cargo ship unmanned and appropriated for transportation in specially equipped ships (barge and lighter carriers) and for towing (pushing) within the specified restricted area of navigation.

*A ship for the carriage of vehicles* cargo ship which carries cargo only in ro-ro spaces or spaces for the carriage of vehicles and which is designed to carry empty vehicles as cargo.

*A supply vessel* is a vessel designed basically for the carriage of supplies and cargoes to the mobile and fixed offshore units intended for the different purposes, and fitted generally with a forward superstructure and an after weather cargo deck for processing of the cargo at sea. The ship may be used for towing operations provided the appropriate requirements of the Register rules are complied with.

*Ship engaged in harbour towing* means a ship engaged in an operation intended for assisting ships or other floating structures within sheltered waters, normally while entering or leaving port and during berthing or unberthing operations.

*Ship engaged in escort operation* means a ship specifically engaged in steering, braking and otherwise controlling of the assisted ship during ordinary or emergency manoeuvring, whereby the steering and braking forces are generated by the hydrodynamic forces acting on the hull and appendages and the thrust forces exerted by the propulsion units.

*Ship engaged in anchor handling operations* means a ship engaged in operations with deployment, recovering and repositioning of anchors and the associated mooring lines of rigs or other vessels. Forces associated with anchor handling are generally associated with the winch line pull and may include vertical, transverse, and longitudinal forces applied at the towing point and over the stern roller.

*Ship engaged in lifting operation* means a ship engaged in an operation involving the raising or lowering of objects using vertical force by means of winches, cranes, a-frames or other lifting devices.

*Ship engaged in coastal or ocean-going towing* means a ship engaged in an operation intended for assisting ships or other floating structures outside sheltered waters in which the forces associated with towing are often a function of the ship's bollard pull (MSC/Circ.884)».

*Vessel with auxiliary aero-hydrodynamic equipment* is a vessel which is designed so that during the movement much of its mass is supported by aero-hydrodynamic forces generated by this equipment.

*The ship of mixed (sea - river) navigation* is a ship which by its characteristics is fit and duly admitted for operation in established order for navigation mainly on maritime waterways and the possibility of navigation on inland waterways and is classified in accordance with the Rules for classification and construction of sea vessels.

*Hydrofoil (HV)* is a ship while driving can be supported above the water by hydrodynamic forces generated by foils.

*Hovercraft (HC)* is a vessel in which all or a substantial part of her weight is supported by air pressure pumped in enclosed space underneath the vessel, called the air bag. HC can be amphibious (ACV) and skeg (SES) type.

*A special purpose ship* is a mechanically self-propelled ship which by reason of its function carries on board more than 12 special personnel, including passengers (the latter shall not exceed 12 people, otherwise such ship should not be considered a special purpose ship, as it is a passenger ship). Such ships include research, expedition, hydrographic, training ships; whale and fish factory ships and other ships engaged in processing of living resources of the sea and not engaged in catching; salvage ships, cable-laying ships, seismic survey ships, diving support ships, pipe layers, floating cranes and crane ships.

*Industrial fleet ship* – самохідне або несамохідне судно, призначене для виконання допоміжних робіт, що забезпечують судноплавство, або видобутку піску, ґрунту, каміння та ін. (земснаряди, пісконавантажувачі, крани, майстерні і т.п.).

*A dry cargo ship* is a ship intended for the carriage of different cargoes (general cargoes, containers, timber, bulk cargoes, etc.), except for the liquid bulk cargoes.

*Reid vapour pressure* is the pressure of liquid vapour established by standard procedure in the Reid tester at the temperature of 37,8°C and at the gas to liquid volume ratio of 4:1.

*A cargo ship* is a self-propelled or non-self-propelled ship intended for the carriage of goods and passengers.

*A pontoon* is a non-self-propelled unmanned ship intended for the carriage of deck cargo and having no hatches on deck, except for small manholes for access into the hull, which are closed by covers with seal gaskets.

*Trimaran* is a ship in which the middle tonnage hull is connected by a special construction with two side hulls.

*A hopper dredger* is a self-propelled or non-self-propelled ship intended for the extraction of spoil using dredging gear (buckets, suction pipes, grabs, etc.) and having holds for the storage or carriage of spoil.

*Standby boat* is a ship intended for rescue operations and standby service in areas of industrial activities at sea.

Definitions concerning specific types of ships (nuclear vessels and floating structures, atomic technological service vessels, high-speed crafts, dynamically supported vessels, WIG craft, gas carriers, chemical carriers, drilling ships, floating rigs and stationary offshore platforms, habitable underwater vessels and ship diving facilities) are provided in the relevant Rules for classification and construction of these types of vessels. The list of such Regulations is given in **1.3.1** of General provisions on technical supervision.

**1.2.1.2** З метою використання положень Директиви Європейського Парламенту та Ради 2009/45/ЄС від 6 травня 2009 року стосовно правил та стандартів безпеки для пасажирських суден, що набула чинності 15 липня 2009 року, зі змінами, (далі Директива 2009/45/ЄС):

**.1** *High-speed passenger craft* means a high-speed vessel, as defined in Regulation X/I of the SOLAS 1974 Convention, in its up-to-date version, carrying more than 12 passengers, excluding passenger ships operating inland waters within a distance of not more than 20 miles from the shoreline, corresponding to the average tidal height if:

- their tonnage, which corresponds to the design waterline, is less than 500 m<sup>3</sup> and

- their maximum speed is less than 20 knots.

**.2 Sailing craft** means a ship sailing, even if it is equipped with an engine for auxiliary and emergency purposes.

**.3 A coastal service ship or a coastal service launch** means a ship / used used for the transport and accommodation of industrial personnel not engaged in work on board a ship / launch that is essential to its commercial activities.

**.4 Pleasure craft** is any craft of any type of navigation used on non-commercial basis and intended solely for recreation.

**.5 Tender** means a ship launch used to carry more than 12 passengers from a berth-connected ship to the shore and back.

**.6 Traditional ship** means any historic passenger ship designed before 1965 and their copies made primarily from original materials, including those designed to stimulate and promote traditional skills and maritime navigation and also serve as living cultural monuments operated in accordance with traditional principles of navigation and technics.

### 1.2.2 Explanations

In addition to those given in General Survey Provisions, the following explanations are adopted:

*Agreed standards* are national and international standards, as well as standards of firms (organizations) specified in the Register approved technical documentation on materials, constructions, systems, arrangements products, constructive process and agreed upon by the Register.

*Alternative constructions and appliances* are constructions or measures and appliances that differ from those provided for by the requirements of chapters II-1, II-2 and III of the SOLAS international convention, but are suitable for meeting their objectives and approved by the Flag State Maritime Administration in accordance with the requirements of the convention. The term includes a wide range of facilities, including alternative ship structures and systems based on new or unique design solutions, as well as traditional ship structures and systems installed in alternative gears or systems.

*Deviation* is the use of equipment, material, arrangements, device or design solutions other than those prescribed by the classification requirements of the VRS rules and duly approved by the Register.

*Recognized standards* are national and international standards referred to in the appropriate parts of the VRS Rules. In case the standard code does not contain the year of its publication, the standard effective as of the date of submission to the Registry of technical documentation that uses this standard shall be applied. In other cases, the standard effective as of the date of provision of another service by the Register with application of the requirement of the Rules containing reference to this standard shall be applied.

*Measurement of distances* - unless explicitly stipulated otherwise in the text of the regulations in SOLAS Convention, International Convention on Load Lines and MARPOL Convention and any of their mandatory Codes, as well as in the text of the RS rules and guidelines, distances (such as tank length, height, width, ship (or subdivision or waterline) length, etc.) shall be measured by using moulded dimensions.

*Owner* is a physical person or legal entity having proprietary rights to a ship irrespective of the fact whether he (she) or it operates the ship on his (her) or its own, or has placed it in the operation of another person or entity whether on the fiduciary or some other legal basis.

*Date of contract for construction of a ship (series of ships).*

**.1** the date of "contract for construction" of a ship is the date on which the contract to build the ship is signed between the prospective owner and the shipbuilder. This date and

the construction numbers (i.e. hull numbers) of all the ships included in the contract shall be declared to the Register by the party applying for the assignment of class to a newbuilding.

**.2** the date of "contract for construction" of a series of ships, including specified optional ships for which the option is ultimately exercised, is the date on which the contract to build the series is signed between the prospective owner and the shipbuilder.

Ships built under a single contract for construction are considered a "series of ships" if they are built to the same approved plans for classification purposes. However, ships within a series may have design alterations from the original design provided:

**.2.1** such alterations do not affect matters related to classification; or

**.2.2** if the alterations are subject to classification requirements, these alterations shall comply with the classification requirements in effect on the date on which the alterations are contracted between the prospective owner and the shipbuilder or, in the absence of the alteration contract, comply with the classification requirements in effect on the date on which the alterations are submitted to the Register for approval.

The optional ships will be considered part of the same series of ships if the option is exercised not later than 1 year after the contract to build the series was signed.

**.3** if a contract for construction is later amended to include additional ships or additional options, the date of "contract for construction" for such ships is the date on which the amendment to the contract, is signed between the prospective owner and the shipbuilder. The amendment to the contract shall be considered as a "new contract" to which the above explanations apply.

**.4** if a contract for construction is amended to change the ship type, the date of "contract for construction" of this modified ship or ships is the date on which revised contract or new contract is signed between the shipowner, or shipowners and the shipbuilder.

*Notes :* By optional ships, ships are meant, which are included in the contract with the condition of the additional confirmation of their construction (order) by a prospective owner. This explanation became effective on 1 July 2009.

*Equivalence* is the use of equipment, material, arrangements, device or design solutions other than those prescribed by the international statutory requirements or approved by the Administration in compliance with the requirements of SOLAS, LLand MARPOL Conventions.

*Occasional navigation* - irregular operation of vessels in the area (area of navigation) of a higher level or in ice conditions that is allowed by the Register, subject to additional requirements for the design, freeboard, equipment, supply and limitations of navigation area, wind-wave mode, seasonality, ice conditions, etc.

*The Register class (class)* is a combination of conventional characters and descriptive notations assigned to the ships, other floating facilities, as well as to fixed offshore platforms, which define their structural features, purpose and operational conditions stipulated by the Register rules.

*An operator* is a physical person or legal entity operating a ship on the basis of a contract concluded with an owner or shipowner.

*Special consideration* is the determination of the extent, to which an object under technical supervision meets the additional requirements.

*A shipowner* is a physical person or legal entity operating a ship on his (her) or its own behalf irrespective of the fact whether he (she) or it is the owner or is operating the ship on some other legal basis.

*A ship under construction* is a ship during a period from the keel laying date till the date of issuing the documents for a ship.

Keel laying date means: the date (day, month, year) on which the installation at the building berth of a base section or block (island) in section or block (island) construction respectively, or

such a stage of construction at which construction identifiable with a specific ship begins and assembly of that ship has commenced comprising at least 50 t or 1 % of the estimated mass of all structural materials, whichever is less.

For fiber-reinforced plastic (FRP) ships, the keel laying date shall be interpreted as the date that the first structural reinforcement of the complete thickness of the approved laminate schedule is laid either in or on the mould.

*A ship* in service is a ship which is not under construction.

*Dual class* is a class of a ship classed with two societies entered into Dual Classification Agreement.

### 1.2.3 Hydrometeorology for ships

#### 1.2.3.1 General.

**1.2.3.1.1** Characteristics of wind are adopted according to the Beaufort scale adopted by the World Meteorological Organization (WMO).

**1.2.3.1.2** The relationship between wind and waving with reference to the distance from the shoreline is adopted for ocean and marine areas based on the basic characteristics of fully developed waving over the spectrum of Pearson - Moskovyts listed in the Table 1.2.3.1.

#### 1.2.3.2 Terminology.

**Wind** – horizontal air movement.

**Wind direction** - is determined on sides of the world of rumba under Rule: the wind blows in compass. Wind direction which changes frequently is called unstable. In terms of river wind that blows down, is called upper wind, from the bottom up - lower wind. The name of the wind is correct only for a particular area of the river.

**Wind speed** is expressed by the number of meters, passed by air mass in one second.

**Squall** - sudden appearance and strong wind, or abrupt temporary change of its direction, or a sharp increase in its speed.

**Waves on a water surface by origin (forces that cause waving)** are divided into the following types:

- **Anomobaric** arising from the recession and the surge of water, as well as sharp changes in atmospheric pressure;

- **Ripples** - waving that continues after the wind has died down, weakened, or that changed the direction and distributed by inertia in the form of free waves;

- **Wind waves**, generated by the wind. Wind waves are asymmetrical, their windward slope is sloping, leeward - steep; Mouth - that arise at the mouth of the rivers at their confluence in the sea, lakes and rivers in shallow areas (bar);

- **Dead wave** - waving that spreads by inertia in complete calm;

- **Tidal wave** arising under the forces of attraction of the Moon and the Sun;

- **Seiche** - free gravitational standing waves in closed or semi closed basins;

- **Ship** waves formed during the movement of the vessel;

- **Chopping** - chaotic accumulation of waves formed during direct meetings with the reflected waves;

- **The tsunami (seismic)**, resulting from earthquakes, volcanic eruptions and other dynamic processes in the Earth's crust.

The waves are characterized by the following parameters:

- **Wavelength ( $\lambda$ )** – the horizontal distance between adjacent crests of waves or soles, m;
- **Wave height ( $h$ )** – the vertical distance from the trough to the crest of the wave, m;
- **Wave steepness ( $\alpha$ )** - the angle of slope of the waves. Steepness of waves also characterizes the ratio of height  $h$  to its wave length  $\lambda$ , depending on the depth of water area and usually is less than 1/15 of the seas and oceans and less than 1/10 on reservoirs and lakes, the maximum value of 1.8;
- **Wave period, ( $\tau$ )** – period of time during which two adjacent crests of waves consistently pass through the same point  $s$ ;
- **Wave speed, ( $WS$ )** – distance which crest or trough pass per time unit in the direction of its movement;
- **Wave front** – line, perpendicular to the direction of the wave;

**Wavv height-** the estimated height of wind waves with the probability adopted for the water basins of a given zone or a given water basin.

For the purpose of these Rules the following wave characteristics with definitions and designations have been adopted:

- significant waves height –  $h_{1/3}$ ;
- occasional waves height -  $h_{max}$ ;
- wave height with 3% probability -  $h_{3\%}$ ;

and applicable dependence:

$$h_{3\%} = 1,32 h_{1/3} = 0,66 h_{max}$$

**significant waves height ( $h_{1/3}$ )** - the average height of one-third of the highest waves from the entire set of wave heights during continuous long-term observation (within the quasi-stationarity of waves), which approximately corresponds to the wave height estimated by the observer in the experiment. Some waves will be twice this height.

**occasional waves height ( $h_{max}$ )** - is the height of the wave itself, that has been discovered during continuous long-term observation.

**wave height with 3% probability ( $h_{3\%}$ )** - design height of irregular waves, when assigned, it is assumed that with continuous long-term observation, 3% of actual waves may have a height equal to or higher than the design.

#### 1.2.3.3 Evaluation of waving.

The degree of waving is measured at the 9-point scale waving developed by WMO, which is shown in the Table. 1.2.3.3.

A typical relationship between wind and waving is shown in Table. 1.2.3.1 and Fig. 1.2.3.3..

#### 1.2.3.4 Evaluation of wind power and wind load.

Wind speed is measured by a 12-point wind scale at a height of 10,0m above the water surface according to the Beaufort scale of wind speed estimation given in Table. 1.2.3.4.

Estimated wind pressure is defined as the amount of static (middle) and dynamic (pulsating) components.

Estimated wind pressure is determined in relation to the height of the center of the vessel sails considering the height of wind waves defined by Rules for ship navigation area that meets prescribed class of the Register as required in Parts IV «Stability».

##### 1.2.3.4.1 Determining the static pressure component of the wind.

The static component of wind load,  $W_s$  Pa is determined by the formula:

$$W_{CT} = 0,732k\nu_0^2 \quad (1.2.3.4.1)$$

where:

$\nu_0$ - wind speed at 10 meters above the water surface, taken as the average wind speed range specified in Table 1.2.3.4;

$k$  - factor that takes into account the change of wind pressure height, and is assumed to be:



0.75 for heights 5.0 m and less; 1.0 for heights of 10, 0 and more.

Intermediate values are determined by linear interpolation.

#### 1.2.3.4.2 Determination of dynamic component of wind pressure

Dynamic component of wind pressure,  $W_D$ , Pa, is determined according to the formula:

$$W_{DM} = W_{CT} \zeta \eta \quad (1.2.3.4.2)$$

where:

$\zeta$ - wind pressure pulsation rate, assumed to be:

0,85 - for heights 5,0 m and less;

0,76 - for height 10,0 m ;

0,69 - for height 20,0 m.

Intermediate values are determined by linear interpolation.

$\eta$ - the correlation rate of wind pressure pulsations adopted according to Table 1.2.3.4.2.

**Table 1.2.3.4.2. The correlation rate of wind pressure pulsation**

The length of the hull on the water line, m	The height of the center of ship sails above the waterline, m		
	2,5	5,0	10
0,1	0,95	0,92	0,88
5,0	0,89	0,87	0,84
10	0,85	0,84	0,81
20	0,80	0,78	0,76
40	0,72	0,72	0,70

*Note:* Intermediate values are determined by linear interpolation

Table 1.2.3.1 Main characteristics of fully developed waving (by Pearson - Moskovyts).

The force of the wind on the Beaufort scale at a height of 6,0m		Wind speed, m / s		Sea rough per 9-point WMO scale	Wave height		Wave period, s	Wave length, m	Wave acceleration length, miles	Wave acceleration time, hours
		Point and name of wind	Range		Meas-	h 1/3				
1	Calm	0,6 - 1,7	1,0	0	<0,05	<0,10	0,3-1,9	0,3	5	0,3
2	Light air	1,8 - 3,3	2,6	1	0,15	0,20	0,4-2,8	2,0	8	0,6
3	Light breeze	3,4 - 5,2	4,4 5,1	2	0,40 0,55	0,52 0,72	0,8-5,0 1,0-6,0	6,1 8,2	9,8 10	1,7 2,4
4	Gentle breeze	5,3 - 7,4	6,2 7,0	3 3	0,79 1,0	1,0 1,3	1,0-7,0 1,4-7,6	12 16	18 24	3,8 4,8
5	Moderate breeze	7,5 - 9,8	8,2 9,3 10,8	4 4-5 4-5	1,4 1,8 2,0	1,9 2,4 2,6	2,0-8,8 2,5-10,0 2,8-10,6	22 27 30	40 55 65	6,6 8,3 10,2
6	Strong breeze	9,9 - 12,4	10,3 11,3	5 5	2,2 2,7	2,9 3,5	3,0-11,1 3,4-12,2	35 40	75 100	10 12
7	Near (hard) gale	12,5 - 15,2	12,6 13,4 14,4	5-6 6 6	3,3 3,7 4,4	4,4 4,9 5,7	3,8-13,6 4,0-14,5 4,5-15,5	50 55 65	140 180 220	15 17 20
8	Gale	15,3 - 18,2	15,7 16,4 17,5	6-7 6-7 7	5,1 5,7 6,4	6,8 7,5 8,5	4,8-17,0 5,0-17,5 5,5-18,5	80 85 100	290 340 420	24 27 30
9	Strong gale	18,3 - 21,5	19,0 20,6	7-8 8	7,6 8,9	10,0 11,7	6,0-20,5 6,5-21,7	115 135	530 710	37 42

**Table 1.2.3.3. Sea state scale.**

<b>(Grade)</b>	<b>(Wave height), м</b>	<b>Description</b>	<b>Signs to determine the state of the water surface</b>
0	0	calm-glassy	Sea like a mirror
1	0-0,1	calm-rippled	Ripples with appearance of scales are formed, without foam crests
2	0,1—0,5	smooth-wavelet	Small wavelets still short but more pronounced; crests have a glassy appearance but do not break
3	0,5—1,25	slight	Large wavelets; crests begin to break; foam of glassy appearance; perhaps scattered white horses
4	1,25—2,0	moderate	Small waves, becoming longer, fairly frequent white horses
	2,0-2,50		Moderate waves, taking a more pronounced form, many white horses are formed. Chance of some spray
5	2,50—4,0	rough	Large waves begin to form, the white foam crests are more extensive everywhere. Probably some spray
6	4—6	very rough	Sea heaps up and white foam from breaking waves begins to be blown in streaks along the direction of the wind
7	6—7,5	high	Moderately high waves of greater length; edges of crests break into spindrift; foam is blown in well-marked streaks along the direction of the wind
	7,5-9		High waves; dense streaks of foam along the direction of the wind; sea begins to roll; spray affects visibility
8	9—12,5	very high	Very high waves with long overhanging crests; resulting foam in great patches is blown in dense white streaks along the direction of the wind; on the whole the surface of the sea takes on a white appearance; rolling of the sea becomes heavy; visibility affected
	12,5-14		Exceptionally high waves; small- and medium-sized ships might be for a long time lost to view behind the waves; sea is covered with long white patches of foam; everywhere the edges of the wave crests are blown into foam; visibility affected
9	>14	phenomenal	The air is filled with foam and spray; sea is completely white with driving spray; visibility very seriously affected

**Table 1.2.3.4. Assessment of wind speed upon Beaufort 12-point scale at 10 m height**

Beaufort number	Description of wind	Wind speed m/s	Sea conditions	Land conditions
0	Calm	0 - 0,2/ (0)	Sea like a mirror	Smoke rises vertically
1	Light air	0,3 - 1,5/ (1,0)	Ripples with appearance of scales are formed, without foam crests	Direction shown by smoke drift but not by wind vanes
2	Light breeze	1,6 - 3,3/ (3,0)	Small wavelets still short but more pronounced; crests have a glassy appearance but do not break	Wind felt on face; leaves rustle; wind vane moved by wind.
3	Gentle breeze	3,4 - 5,4/ (5,0)	Large wavelets; crests begin to break; foam of glassy appearance; perhaps scattered white horses	Leaves and small twigs in constant motion; light flags extended
4	Moderate breeze	5,5 - 7,9/ (7,0)	Small waves becoming longer; fairly frequent white horses	Raises dust and loose paper; small branches moved.
5	Fresh breeze	8,0 - 10,0/ (9,0)	Moderate waves taking a more pronounced long form; many white horses are formed; chance of some spray	Small trees in leaf begin to sway; crested wavelets form on inland waters.
6	Strong breeze	10,1-13,8/ (12,0)	Large waves begin to form; the white foam crests are more extensive everywhere; probably some spray	Large branches in motion; whistling heard in telegraph wires; umbrellas used with difficulty
7	High wind, moderate gale, near gale	13,9-17,1/ (15,0)	Sea heaps up and white foam from breaking waves begins to be blown in streaks along the direction of the wind; spindrift begins to be seen	Whole trees in motion; inconvenience felt when walking against the wind.
8	Gale, fresh gale	17,2-20,7/ (19,0)	Moderately high waves of greater length; edges of crests break into spindrift; foam is blown in well-marked streaks along the direction of the wind	Twigs break off trees; generally impedes progress.
9	Strong/severe gale	20,8-24,4/ (23,0)	High waves; dense streaks of foam along the direction of the wind; sea begins to roll; spray affects visibility	Slight structural damage (chimney pots and slates removed)
10	Storm, whole gale	24,5-28,5/ (27,0)	Exceptionally high waves; small- and medium-sized ships might be for a long time lost to view behind the waves; sea is covered with long white patches of foam; everywhere the edges of the wave crests are blown into foam; visibility affected	Seldom experienced inland; trees uprooted; considerable structural damage.
11	Violent storm	28,6-32,0/ (31,0)	Exceptionally high waves; small- and medium-sized ships might be for a long time lost to view behind the waves; sea is covered with long white patches of foam; everywhere the edges of the wave crests are blown into foam; visibility affected	Very rarely experienced; accompanied by widespread damage
12	Hurricane	Over 32,0	The air is filled with foam and spray; sea is completely white with driving spray; visibility very seriously affected	Devastation

### 1.3 APPLICATION

**1.3.1** Rules for the Classification and Construction of Sea-Going Ships, hereinafter in this part of these Rules, apply to seagoing and sea-river navigation ships:

**.1** Passenger ships and tankers, ships for carriage of dangerous goods, as well as tugs, regardless of length, power of main engines and gross tonnage;

**.2** Self-propelled ships not listed in **1.3.1.1**, with the largest hull length of 24 meters or more and main engines power 55 kW or more;

**.3** Ships not listed in **1.3.1.1** and **1.3.1.2**, with the largest hull length of 24 meters or more gross tonnage of 80 or more, or are equipped with machinery and equipment with total power of the primary engines of 100 kW or more;

**.4** Materials and articles intended for installation on vessels specified above, the manufacture of which must be carried out under the supervision of the Register (lists of materials and products are given in the relevant parts of these Rules):

**.5** Ship refrigerating plants stated in **5.1.1** of this Part.

*Note.* Marine pushers, icebreakers, stationary vessels with over 12 passengers on board, floating cranes and ships of industrial fleet (floating workshops, dredgers, etc.), not depending on specified in **1.3.1.2** and **1.3.1.3** maximum length and vessels with the largest hull length of 24 meters or more, regardless of the specified in **1.3.1.2** and **1.3.1.3** power and gross tonnage, are subject to classification and technical supervision in accordance with these Rules.

**1.3.2** These Rules are applied to sea and mixed (sea-river) navigation ships engaged in domestic sea (coastal) voyages, depending on navigation area limit sign in the symbol of ship's class under **2.2.5.1.5** with regard to the classification of passenger ships under the European Parliament and Council Directive 2009/45 / EC with application for ships:

with signs **A, A-R1, A-R2, A-R2-S** and **A-R2-RS** (Class **A** of sea area pursuant to Directive 2009/45 / EC) - of the requirements of these Rules for vessels respectively to unrestricted navigation area and with signs of restricted areas of navigation **R1, R2, R2-S** and **R2-RS**;

with signs **B-R3-S** i **B-R3-RS** (Class **B** sea area pursuant to Directive 2009/45 / EC) – of the requirements of these Rules for vessels respectively with signs of restricted areas of navigation **R3-S** and **R3-RS**;

with signs **C-R3-S** i **C-R3-RS** (Class **C** sea area pursuant to Directive 2009/45 / EC) – of the requirements of these Rules for vessels respectively with signs of restricted areas of navigation **R3-S** and **R3-RS**;

with signs **D-R3-S** i **D-R3-RS** (Class **D** sea area pursuant to Directive 2009/45 / EC) – of the requirements of these Rules for vessels respectively with signs of restricted areas of navigation **R3** and **R3-IN**.

Passenger ships and high-speed passenger ships, built by July 1, 2008 and after that date must meet the requirements of these Rules concerning safety of persons with reduced mobility.

With confirmation of compliance with Directive 2009/45 / EC passenger ships and high-speed passenger ships, which are used as public transport, the keel of which was laid or which were at a similar stage of construction on October 1, 2004 or after that date must meet the requirements of these Rules, concerning safety of persons with reduced mobility. For the purpose of modifying ships and high-speed craft used as public transport, the keel of which was laid or which were at a similar stage of construction before 1 October 2004, Member States shall apply these requirements as far as is economically feasible.

When these ships are engaged in the international voyages, as well as ships to which provisions of Directive 2009/45/EC does not apply, the requirements of these Rules shall apply without regard to the requirements for ships with signs in accordance with **2.2.5.1.5** of this part of the Rules.

**1.3.3** Personnel ships (refer to **1.2.1.1**) according to the recommendations adopted by the Resolution MSC.418 (97) shall be consistent with the Special Purpose Ships Safety Code adopted by the Resolution MSC.266 (84), as amended (SPS Code 2008) and the relevant requirements of these Rules or, in agreed with the Register, the provision of other standards, provided that they secure an equivalent level of safety acceptable to the Register and the Administration, taking into account the number of people on board the ship. At the same time, high-speed personnel ships shall comply with the requirements of of Resolutions MSC.419(97).

These Rules apply to special purpose ships of 500 gross tonnage and over. For special purpose ships with a gross tonnage of less than 500, the requirements of these Rules are applied to the extent appropriate and practically possible with the agreement of the Register.

If case of special requirements of the ship's Flag Administration for ships of less than 500 gross tonnage, for example, the requirements of the Administration of the Republic of Palau specified in the document PALAU

INTERNATIONAL SHIP REGISTRY «CODE OF SAFETY FOR CARGO SHIPS OF LESS THAN 500 GROSS TONNAGE», such requirements apply to ships flying the flag of this Administration without compromising the level of safety that is provided for such ships by these Rules. By agreement with the Register, the safety level can be reduced to the level of the requirements of the document of the ship's Flag Administration for the ship flying its flag.

**1.3.4** In the classification of passenger ships and mixed (sea-river) navigation ships engaged on domestic voyages, subject to classification according to Directive 2009/45/EC, in addition to the terms and their definitions in accordance with **1.2.1.2**, the following terms and their definitions are used:

*GMDSS* means the Global Maritime Distress Safety System as is set out in Chapter IV of SOLAS Convention 1974, as amended, and in Rules for the equipment of sea-going ships;

*significant wave height* means the average height of the one-third of highest waves observed over a given period;

*sea areas* - means areas identified in accordance with 2.2.5.1.5 of this Part I "Classification".

However, for the use of provisions on radio communication, the definitions of sea areas will be accepted those specified in the Rule 2 of Chapter IV of SOLAS 1974 Convention, as amended;

*persons with reduced mobility* means persons who have some difficulty using public transport, including the elderly, persons with disabilities, persons with sensory impairments and wheelchair users, pregnant women and persons accompanying small children;

*harbor area* means an area other than sea areas, see above, as defined by the State Party having jurisdiction over Directive 2009/45 / EC, extending to the outermost permanent berths forming an integral part of the port system or to the limits defined by natural geographical features which protect the mouth or such a protected area.

**1.3.5** Rules for classification and construction of sea-going ships consist of following parts:

Part I "Classification";

Part II "Hull";

Part III "Equipment, Arrangements and Outfit";

Part IV "Stability";

Part V "Subdivision";

Part VI "Fire Protection";

Part VII "Machinery Installations";

Part VIII "Systems and Piping";

Part IX "Machinery";

Part X "Boilers, Heat Exchangers and Pressure Vessels";

Part XI "Electrical Equipment";

Part XII "Refrigerating Plants";

Part XIII "Materials";

Part XIV "Welding";

Part XV "Automation";

Part XVI "Structure and Strength of Fiber-Reinforced Plastic Ships";

**1.3.6** Register takes into account, as necessary, the requirements of international conventions, codes, agreements, directives, resolutions, standards and requirements of Administrations that are within the competence of the Register. Certain requirements are included directly in the text of the Register Rules; some requirements in the text of the Register Rules have corresponding references. The requirements of the following international documents, as well as amendments thereto, are taken into account in the Rules for classification and construction of Sea Going Ships:

International Convention for the Safety of Life at Sea, 1974 (SOLAS 74), as amended by the Protocols of 1978, 1988 relating thereto (SOLAS 74/88);

International Convention for the Prevention of Pollution from Ships, 1973, as modified by the Protocol of 1978 relating thereto (MARPOL 73/78);

International Convention on Load Lines, 1966 (LL-66), as modified by the Protocol of 1988 relating thereto (LL 66/88);

International Convention on Tonnage Measurement of Ships (TONNAGE), 1969;

International Convention for the Control and Management of Ships' Ballast Water and Sediments (BWM Convention), 2004;

International Convention on the Control of Harmful Anti-fouling Systems on Ships (AFS Convention), 2001;

Occupational Safety and Health (Dock Work) Convention, 1979 (No. 152) and ILO Code of Practice on Safety and Health in Ports, 2005;

Convention on the International Regulations for Preventing Collisions at Sea, 1972 (COLREG 72);

International Code for the Construction and Equipment of Ships Carrying Dangerous Chemicals in Bulk (IBC Code);

International Code for the Construction and Equipment of Ships Carrying Liquefied Gases in Bulk (IGC Code);

International Code of Safety for High-Speed Craft (HSC Code);

Code for the Construction and Equipment of Mobile Offshore Drilling Units (MODU Code);

Code of Safety for Special Purpose Ships (SPS Code);

Code of Safety for Diving Systems;

International Code on Intact Stability, 2008 (IS Code)

Stockholm Agreement (special requirements for the stability of ro-ro passenger ships), 1996 (Stockholm Agreement);

Code on Alerts and Indicators;

International Life-Saving Appliance Code (LSA Code);

International Code for Fire Safety Systems (FSS Code);

International Code for Application of Fire Test Procedures (FTP Code);

International Code of Safety for Ship Using Gases or Other Low-Flashpoint Fuels (IGF Code);

Code of Safe Practices for Ships Carrying Timber Deck Cargoes, 2011 p. (Timber Code).

International Code for the Safe Carriage of Grain in Bulk (International Grain Code);

Code of Safe Practice for Cargo Stowage and Securing 1991 (CSS Code);

International Code for Ships Operating in Polar Waters (Polar Code);

International Code for the Safe Carriage of Packaged Irradiated Nuclear Fuel, Plutonium and High-level Radioactive Wastes on Board Ships (INF Code);

International Maritime Solid Bulk Cargoes Code (IMSBC Code);

International Maritime Dangerous Goods Code (IMDG Code);

Code of Safe Practice for the Carriage of Cargoes and Persons by Offshore Supply Vessels (OSV Code);

Code for the Transportation and Handling of Hazardous and Noxious Liquid Substances in Bulk on Offshore Support Vessels (OSV Chemical Code);

Code on noise levels on board ships 2012 (Noise Code);

Technical Code on Control of Emission of Nitrogen Oxides from Marine Diesel Engines, 2008 (NOx Technical Code);

International Ship and Port Facility Security (ISPS) Code 2003 (ISPS Code);

inter-governmental agreements on load lines in force;

The European Agreement concerning the International Carriage of Dangerous Goods by Inland Waterways (ADN) 2000;

Directive 2009/45 / EC on safety rules and standards for passenger ships, 2009 (Directive 2009/45 / EC);

Directive 2003/25 / EC on specific requirements for the stability of ro-ro passenger ships, 2003 (Directive 2003/25 / EC);

Directive (EU) 2016/1629 laying down technical requirements for inland navigation vessels, 2016 (Directive (EU) 2016/1629);

Directive 2013/53 / EU on pleasure craft and passenger ships, 2013 (Directive 2013/53 / EU);

Directive 2014/90 / EU on marine equipment, 2014 (Directive 2014/90 / EU)

and a number of other applicable normative documents used in international and judicial practice, including applicable resolutions of the United Nations Economic Commission for Europe and the Danube Commission, national requirements and documents of the Administrations.

The provisions of the said conventions, codes, agreements, resolutions and documents by the Administration are applied to ships in accordance with the requirements of the Rules and the provisions of these documents, national requirements and documents of the Administration.

**1.3.7** These Rules apply to berth-connected ships in the part that are not stipulated by the Rules of specific requirements for them, depending on the conditions of the wind-wave regime of a restricted navigation area (navigation area sign) in accordance with the Rules in which the berthing place of the berth-connected ship is located. At the same time, and if the conditions of the wind-wave regime are exceeded at the berthing area of the characteristics established for a restricted navigation area, the actual conditions of the ship's berthing may be taken into account.

The valid conditions of anchorage of a berth-connected ship are established on the basis of the substantiation of the conditions for anchorage of a berth-connected ship approved by the Register (subject to special

consideration). At the same time, seasonal restrictions on the anchorage of the ship in the anchorage area and the possibility of moving the ship to a protected place of refuge.

**1.3.8** These Rules in coordination with the Register, may be used for classification of ships and floating structures, including unusual design, not listed in the paragraphs of this Part governing the distribution of specified Rules, especially with the establishment by the Register of the special scope of Rules application.

**1.3.9** Rules define the requirements under which the vessel floating structure or vessel's refrigeration unit may be assigned a class of the Register.



## 2. CLASS OF SHIP

### 2.1 GENERAL

**2.1.1** The Register class is assigned to ships and floating structures, including mobile offshore drilling units (MODU) and fixed offshore platforms (FOP), which fully or to the extent recognized by the Register as sufficient, comply with the requirements of the relevant Rules for Classification and Construction. The assigned Register class is indicated by the class notation in accordance with **2.2**.

Assignment of the Register class to a ship means confirmation by the Register that the ship construction complies with the applicable requirements of the VRS Rules and its technical condition complies with the conditions of the ship operation; the ship is registered with the Register for a specified period with performing the surveys stipulated by the Rules for the Classification Surveys of Ships for this period.

Ships in operation are subject to the requirements of the amended Regulations, according to which they were built, unless otherwise indicated in the following publications of Regulations or bulletins of additions and amendments to the Regulations issued after the publication of Regulations.

**2.1.2** The Register may assign a class to a ship proceeding from the results of survey during its construction, as well as assign or renew a class to a ship in service.

**2.1.3** Renewal of a ship's class means confirmation by the Register that the ship and her technical condition comply with the provisions based on which a class has been previously assigned as well as extension of the Register documents for a period as required by the Rules for the Classification Surveys of Ships in Service.

**2.1.4** Class of the vessel is assigned or renewed by the Register as a Rule for five years period for ships classified according to the requirements of these Rules.

In sound cases the Register may assign or renew the class for the shorter period.

**2.1.5** If a ship has the valid Register class, this means that the ship's technical condition in full measure or to a degree considered adequate by the Register complies with the requirements of the Register rules, which apply to it according to its purpose, operating conditions and class notation. The validity of the ship's class shall be confirmed by the valid Classification Certificate.

**2.1.6** Classification Certificate becomes invalid and classification is automatically suspended in the following cases:

when the ship as whole or her separate elements have not been subjected to scheduled periodical or occasional surveys in specified terms (if the special survey has not been completed or the ship is not under attendance for completion prior to resuming trading, by the due date); if the annual survey has not been completed within three (3) months of the due date of the annual survey; if the intermediate survey has not been completed within three (3) months of the due date of the third annual survey in each periodic survey cycle;

unless the ship is under attendance for completion of the relevant survey if in the Register rules it is not required otherwise;

if the owner /ship-owner does not notify the Register to provide the ship for survey after breakdowns or damage affecting the class;

after an accident (the ship shall be submitted for occasional survey at port where the accident took place or at the first port of call or the arrival of a small craft at the base, place of berthing, if the accident took place at sea);

if repairs, re-equipment or structural changes and / or changes in the ship's outfit have been reduced from those prescribed by the Rules affecting the class, not approved by the Register, are performed either without an application for survey by the Register or do not satisfy its surveyor;

if, taking into account the identified deficiencies, the Register considers that the ship has no right to maintain its class, even on a temporary basis (until the necessary repairs or renewals, etc.);

when a ship navigates with a draught exceeding that specified by the Register for specific conditions as well as in case of operation of a ship in conditions which do not comply with the requirements for assigned class of a ship or the restrictions specified by the Register;

when the prescribed specific requirements, which during previous survey of the ship were the conditions for assignment or retainment of the Register class, have not been fulfilled within the specified period;

when the process of surveying the ship by the Register has been suspended on the shipowner's initiative or through his (her) or its fault;

when the ship has been taken out of service for a long period (more than 3 months or for a small craft for a period exceeding the date of the next periodic survey, for fulfilment of the Register requirements (except the case when a ship is under repair for these purposes);

in case of the ship's seizure by pirates;

after the ship was abandoned by the crew.

Automatic suspension of the class is effective from the date on which the circumstances that led to the suspension occurred.

Suspension by decision of the Register comes into force from the moment when conditions for suspension of the class have appeared.

The suspension of the class will remain in effect until the class is renewed (as specified in **2.1.78**).

The ship's class may be suspended for a period not exceeding six months. A longer suspension may be granted at the discretion of the Register when the ship is not engaged on merchant voyages, as in the case of circumstances, pending a decision in the event of an accident or maintenance to recover.

Suspension and renewal of the class of dual-class ships.

In case of dual class, if the Register takes measures to suspend the class of the vessel for technical reasons, the Registry shall notify the "Other Society" (refer to note) of the reasons for such action and the full circumstances within five (5) working days.

If the Register is notified that the "Other Society" has suspended the class for technical reasons, the Register, upon receipt of such notification, shall also suspend the class of the ship if it cannot confirm by another document that such suspension is incorrect.

When the Register decides to renew the class, it informs the "Other Society".

*Note.* «Other Society» means another classification society participating in a class compatible with the Register.

**2.1.7** Suspended (as stated in **2.1.6**) class of a ship may be reinstated on the basis of satisfactory results of the appropriate periodical or occasional survey carried out by the Register in the case of ship to be submitted for survey. In so doing when the ship is taken out of service for a long period (more than 3 months), the scope of survey for reinstatement of a ship's class shall be specially established by the Register taking into account the age and condition of the ship as well as the period for which she is taken out of service.

For the period from the suspension of the class to its renewal, regardless of the date specified in **2.1.10** notification to the ship-owner and the ship Flag Administration, the ship is considered to have lost the class of the Register.

**2.1.8** The class of a ship is withdrawn by the Register in the following cases:

- .1** if the reasons for suspension of the current class have not been rectified within the established period of its suspension;
- .2** upon expiration of the maximum term of class suspension;
- .3** when the Register and/or shipowner consider reinstatement of the class suspended as stated in 2.1.6 to be impossible;
- .4** upon transfer of the ship to the class of another classification body;
- .5** in case of transfer of ownership of the vessel, change of ship-owner, port of registration or name of the ship without providing it for surety in accordance with;
- .6** at the request of the shipowner.

Withdrawal of the ship's class means invalidation of the Classification Certificate. The withdrawal of a class becomes effective from the date on which the circumstances giving rise to such withdrawal arise.

At the request of the owner, a ship that was previously classified by the Register and then the class was withdrawn, and which was not additionally classified, that is:

- has never resumed its operation;
- has not been classified by any other Classification Society,

the class may be reassigned by the Register, but the Register has the right to reject the application for reassignment of the class.

**2.1.9** The ship class is canceled due to ship's loss or her decommissioning as well as in case of obtaining information from the shipowner on the ship demolition or selling for scrapping.

**2.1.10** The Register specifically informs the ship-owner and for the ship in respect of which the Register is carrying out a statutory survey, the Flag Administration about the suspension of the ship's class and the validity of the Classification certificate, withdrawal of the ship's class with the termination of the Classification certificate and class cancellation.

**2.1.11** With the assignment of the class, the Register includes the ship, except for small craft, in the Register book and excludes it when withdrawing or canceling the class.

## 2.2 CLASS NOTATION OF A SHIP

The class notation assigned by the Register to a ship or offshore installation consists of the character of classification, mandatory distinguishing marks and descriptive notations, and optional distinguishing marks

defining structure and purpose of a ship or offshore installation.

The sequence of mandatory and optional (if any) distinguishing marks and descriptive notations being added to the character of classification of a ship is set down by the provisions of this Part.

Optional marks introduced by this Part do not establish necessary performance of requirements of parts of the Rules for the classification and construction of Sea-Going Ships and reflect compliance with the requirements established by corresponding parts of Rules.

### 2.2.1 Main symbol of class

#### 2.2.1.1 Main symbol of class of a ship built under the survey of VRS or an IACS Society

.1 The main symbol of class of a ship built under VRS' survey consists of the mark + and the marks **1VS**, inserted after it:

##### +1VS

Survey, in result of which the ship is assigned a class with one of the above main symbols, covers at least:

- Approval of documentation,
- Survey of the manufacture of materials, machinery, installations and equipment,
- Survey of building the ship and the main engine and boilers, where fitted,
- Survey of mooring and sea trials.

.2 If a ship has been built under the survey of an IACS Society, VRS may assign the main symbol of class to an existing ship as in 2.2.1.1, subject to:

- Approval of current technical documentation,
- Carrying out Initial Survey within the scope of Class Renewal Survey, including recommendations and conditions of class stated in the ship's classification status issued by the previous Society.

#### 2.2.1.2 Main symbol of class of a ship built without VRS' survey

.1 If a ship has been built under the survey of another Classification Society and has then been assigned VRS class, the following main symbol of class is given:

##### - 1VS

.2 If a ship has not been built under the survey of any Classification Society, but has later been assigned VRS class, the main symbol of class is put in brackets:

##### - (1VS)

#### 2.2.1.3 Main symbol of class of a ship with an auxiliary mechanical propulsion

A sailing ship with auxiliary mechanical propulsion may be assigned the symbol of class:

##### +1VS or 1VS or (1VS) whichever appropriate

if the power of this propulsion enables to obtain a speed of at least 7 knots in still water.

In such a case a note informing of an auxiliary character of the mechanical propulsion will be entered in the Certificate of Class and the Machinery Certificate will be issued.

#### 2.2.1.4 Symbol of Machinery

##### .1 Symbol of machinery built under VRS' survey

If the machinery has been built under the VRS survey, the following symbol is entered in the Classification Certificate:

##### +ME

In such case the survey of machinery covers at least:

- approval of documentation,
- survey of the manufacture of materials and essential equipment,
- survey of building the main engine and boilers,
- survey of assembling machinery, piping systems and equipment on board ship,
- mooring and sea trials.

##### .2 Symbol of machinery previously classed by another Classification Society.

If the machinery has been classed by another Classification Society and then it has been assigned a class of VRS, the following symbol is entered in the Machinery Certificate:

**ME**

In such case the survey of machinery covers at least:

- review of documentation approved by the previous Classification Society,
- verification of certificates, issued by the previous Classification Society, of main engines and essential machinery and equipment,
- survey within the scope defined by VRS in each particular case,
- mooring trials within the scope defined by VRS.

**.3 Symbol of non-classed machinery**

- When the machinery has not been classed by any Classification Society and then it has been assigned a class of VRS, the following symbol is entered in the Classification Certificate:

**(ME)**

In such case the survey of machinery covers at least:

- approval of technical documentation,
- verification of certificates of main engines and essential machinery and equipment issued by the manufacturer,
- survey of machinery within the scope of class renewal,
- mooring and sea trials within the scope defined by VRS in each particular case.

**2.2.1.5 Additional Descriptive Information**

Other conditions, such as design features, permanent service restrictions or other special features on the basis of which the ship has been assigned a class, not represented by additional marks in the symbol of class, are described in the Appendix to the Certificate of Class/Interim Certificate of Class.

**2.2.3 The Register ice class marks, polar class notations and the Baltic ice class notations.**

**2.2.3.1** The requirements for polar class ships apply to ships constructed of steel and intended for independent navigation in ice-infested polar waters, taking into account the provisions of the Polar Code on the basis of polar classes in accordance with the unified requirements of UR I MACT, in compliance with the relevant requirements of these Rules for ships of these classes.

*Note.* Polar Code means the International Code for Ships Navigating in Polar Waters, adopted by IMO Resolutions MSC.385 (94) and MERC.264 (68), taking into account the provisions of the amendments to the SOLAS-74 International Convention adopted by Resolution MSC.386 (94).

Signs of polar classes and their description are given in Table 2.2.3.1-1.

**Table 2.2.3.1-1 Polar class descriptions**

<b>Polar class</b>	<b>Ice description (based on WMO Sea Ice Nomenclature)</b>
<b>PC1</b>	Year-round operation in all polar waters <sup>1</sup>
<b>PC2</b>	Year-round operation in moderate multi-year ice conditions
<b>PC3</b>	Year-round operation in second-year ice which may include multi-year ice inclusions
<b>PC4</b>	Year-round operation in thick first-year ice which may include old ice inclusions
<b>PC5</b>	Year-round operation in medium first-year ice which may include old ice inclusions
<b>PC6</b>	Summer/autumn operation in medium first-year ice which may include old ice inclusions
<b>PC7</b>	Summer/autumn operation in thin first-year ice which may include old ice inclusions

<sup>1</sup> Polar waters (Arctic waters and the Antarctic region) according to SOLAS-74 regulations XIV / 1.3 and XIV / 1.2.  
*Note.* Ships with signs PC1-PC6 are category A ships as determined by the Polar Code. Ships with PC7 signs are category B ships as determined by the Polar Code. Category C ships as determined in the Polar Code are ships designed to operate in individual ice conditions or in less severe ice conditions than those specified for categories A and B.

Baltic ice classes are assigned for ships intended for operation in the Baltic Sea in winter, taking into account the requirements of the Finnish-Swedish rules for ice class ships, 2017, in compliance with the relevant requirements of these Rules for ships of these classes.

Baltic ice classes and their description are given in Table 2.2.3.1-2.

**Table 2.2.3.1-2 Baltic ice class descriptions**

<b>Baltic ice class</b>	<b>Description</b>
<b>IA Super</b>	ships with such structure, engine output and other properties that they are normally capable of navigating in difficult ice conditions without the assistance of icebreakers

<b>IA</b>	ships with such structure, engine output and other properties that they are capable of navigating in difficult ice conditions, with the assistance of icebreakers when necessary
<b>IB</b>	ships with such structure, engine output and other properties that they are capable of navigating in moderate ice conditions, with the assistance of icebreakers when necessary
<b>IC</b>	ships with such structure, engine output and other properties that they are capable of navigating in light ice conditions, with the assistance of icebreakers when necessary
<b>II</b>	ships that have a steel hull and that are structurally fit for navigation in the open sea and that, despite not being strengthened for navigation in ice, are capable of navigating in very light ice conditions with their own propulsion machinery
<b>III</b>	ships that do not belong to the ice classes referred to above

For sea icebreakers and ice-class ships, including tugs, intended for operation outside polar waters (except for ships intended for navigation in Arctic waters in thin one-year ice) and the Baltic Sea, ice class of the Register is assigned in accordance with 2.2.3.2 and 2.2.3.3 of this Part.

Polar class signs, signs of Baltic ice classes and ice class signs of the Register are applied at the request of the shipowner for ships that are supposed to be operated in appropriate ice and climatic conditions, provided by the Register after carry out of these Rules requirements corresponding to the sign and are added to the character of class. At the same time, for icebreakers (signs of ice classes according to 2.2.3.2) intended for navigation in Arctic waters, and ships intended for navigation in Arctic waters in thin one-year ice (signs of ice classes Ice4, Ice5 and Ice6 according to 2.2.3.3) may be provided Register ice class, when executed, in addition to the requirements for the Register ice class for hull members, all requirements for the corresponding polar class.

**2.2.3.1.1 Icebreakers** are specialized ships intended for all kinds of icebreaking operations: escort of ships in ice, surmount of ice ridges, breaking of a navigable channel, towing, breaking of ice and rescue operations. Dimension and power of icebreaker should be sufficient for carry out active actions in water covered by ice. There are two main regimes of ice navigation while performing icebreaking operations: continuous motion and ramming.

**2.2.3.1.2 Ice class ships** are ships intended for independent ice navigation including motion in fractures between floes, surmounting of ice isthmuses and portions of relatively thin compact ice, or navigation in ice with icebreaker escort.

**2.2.3.1.3** The following definitions are used for the description of ice navigation conditions:

*multi-year* is ice of thickness more than 3,0 m, which has survived at least two summers' melt. It is divided into residual one-year ice, two-year ice and multi-year ice;

*first-year* ice is ice of thickness from 0,3 to 2,0 m, of not more than one winter's growth;

*medium-thick first-year ice* is first-year ice 0,7-1,2m thick;

*thin first-year ice* is first-year ice 0,3-0,7m thick;

*individual ice floes* means large navigable waters where the density of sea ice is less than 1/10 (1 point). Ice of land origin is absent;

*ice cake* is any relatively flat piece of sea ice less than 20 m across.

*Примітка.* Класифікація льоду прийнята відповідно до «Номенклатури морського льоду» Світової метеорологічної організації («Sea Ice Nomenclature» of the World Meteorological Organization (WMO))

*ice concentration* is a measure of ice continuity, which is characterized by the ratio of the area covered by ice to the total water area using 10 number scale;

*open floating ice* is ice of concentration 4 - 6, where most of the floes do not touch each other;

*close floating ice* is ice of concentration 7 - 8 where most of the floes touch each other forming ice isthmuses;

*very close floating ice* is ice of concentration 9 or over, but less than 10;

*compact ice* is ice of concentration 10.

**2.2.3.1.4 A ship intended for operation in conditions of low air temperature** is a ship designed to operate in areas or through areas in which the lowest mean daily freezing temperature (MDFT) is below -10°C.

**Polar working temperature (PWT)** is a temperature set for a vessel intended to operate at low temperatures, which shall be set at least 10 ° C below the lowest MDFT for the intended season and area of operation in polar waters.

**2.2.3.2** If an icebreaker complies with the requirements of these Rules, one of the following ice class marks is added to the character of classification: **Icebreaker1; Icebreaker2; Icebreaker3; Icebreaker4.**

Icebreakers of the above ice classes have the following tentative service characteristics:

**Icebreaker1** – intended for ice breaking operations in harbour and roadstead water areas as well as in freezing seas where the ice is up to 1,5 m thick. Continuous motion capability in unbroken ice up to 1 m thick;

**Icebreaker2** – intended for ice breaking operations in the arctic seas on coastal routes during winter/ spring navigation in ice up to 2,0 m thick and summer/autumn navigation in ice up to 2,5 m thick; in nonarctic freezing

seas and mouths of rivers flowing into arctic seas in ice up to 2,0 m thick. Continuous motion capability in unbroken ice up to 1,5 m thick. The total shaft power not less than 11 MW;

**Icebreaker3** – intended for ice breaking operations in the arctic seas on coastal routes during winter/spring navigation in ice up to 3,0 m thick and summer/autumn navigation without restrictions. Continuous motion capability in unbroken ice up to 2,0 m thick. The total shaft power not less than 22 MW;

**Icebreaker4** – intended for ice breaking operations on coastal routes in arctic seas during winter/spring navigation in ice up to 4,0 m thick and summer/autumn navigation without restrictions. Continuous motion capability in unbroken ice over 2,0 m thick. The total shaft power not less than 48 MW.

### 2.2.3.3 Register ice classes.

**2.2.3.3.1** If a self-propelled ice class ship complies with the relevant requirements of these Rules, one of the following ice class marks shall be added to its character of classification: **Ice1, Ice2, Ice3, Ice 4, Ice5, Ice6**, and the compliance of hull (**hull**) and machinery installation (**machinery**) with the requirements of these Rules in full scope, e.g: **Ice6 (hull; machinery)**.

In case the ship hull corresponds to one ice class and the machinery installation corresponds to another ice class, the applicable ice classes shall be specified separately, e.g: **Ice6 (hull) Ice3 (machinery)**. In such case, a ship with mark (**hull**) in the class notation in addition to the requirements of Part II "Hull" shall comply with requirements to Signal Means:

The light shall reliably operate at variations of ambient temperature from -30 to +45 °C

Lights intended for icebreakers of ice classes **Icebreaker1, Icebreaker2, Icebreaker3, Icebreaker4**, ships of polar class **PC1-PC5**, Baltic ice Class **IA Super IC** and **Ice5, Ice6** shall be adapted to operate at a negative temperature down to — 40 °C.

For ships bearing the **WINTERIZATION** sign, a red flashing light shall be provided. This light shall be manually switched on type, visible from the stern of the ship and indicating that the ship is coming to a standstill. The range of the light shall be at least 2 miles. The horizontal and vertical angles of visibility shall be the same as for stern lights. The lamp shall be operable at the design outside temperature of the outside air or at the temperature operable at the design outside ambient temperature or at the temperature specified above (whichever is lower).

A ship with mark (**machinery**) in the class notation shall comply with the applicable requirements of Parts VI "Fire Protection", VII "Machinery Installations", VIII "Systems and Piping" and IX "Machinery" of these Rules.

Where a non-self-propelled ship complies with the requirements for ice class, a mark (**hull**) shall be added to its character of classification.

**2.2.3.3.2** Register ice classes and their reference descriptions are given in Table. 2.2.3.3.2.

**Table 2.2.3.3.2**

<b>Ice6</b>	In summer/autumn navigation in Arctic - voyage in open floating first-year ice up to 1,3 m thickness. In winter/spring navigation in Arctic - voyage in open floating first-year ice up to 1,1 m thickness. Year-round voyage in freezing non-arctic sea.
<b>Ice5</b>	In summer/autumn navigation in Arctic - voyage in open floating first-year ice up to 1,0 m thickness. In winter/spring navigation in Arctic - voyage in open floating first-year ice up to 0,8 m thickness. Year-round voyage in freezing non-arctic seas
<b>Ice4</b>	In summer/autumn navigation in Arctic - voyage in open floating first-year ice up to 0,8 m thickness. In winter/spring navigation in Arctic - voyage in open floating first-year ice up to 0,6 m thickness. Year-round voyage in freezing non-arctic seas in light ice condition
<b>Ice3</b>	Regular voyage in open floating ice-cake ice of non-arctic seas up to 0,7 m thickness
<b>Ice2</b>	Regular voyage in open floating ice-cake ice of non-arctic seas up to 0,5 m thickness
<b>Ice1</b>	Episodical voyage in open floating ice-cake ice of non-arctic seas up to 0,4 m thickness

**2.2.3.3.3** For tugs, depending on their compliance with the requirements of these Rules for ice class, one of the following ice class marks is added to the character of classification: **Ice2, Ice3, Ice4, Ice5**.

Determination of possible periods and areas of navigation as well as regimes of navigation with icebreaker escort is within the shipowner's competence.

**2.2.3.3.4** An ice class ship which is not an icebreaker in accordance with **2.2.3.2**, but occasionally involved in icebreaking operations, and complies with the relevant requirements of these Rules, may be assigned one of the following ice class marks added to the character of classification: **Icebreaker1** or **Icebreaker2**.

**2.2.3.3.5** Double acting ships, (DAS) are ice navigation ships fitted with podded propulsion units designed to operate stern first in ice.

If double acting ships comply at least with the requirements of **3.14**, Part II «Hull» of these Rules the distinguishing mark **DAS** (**ice class mark**) may be added to the character of classification, where the Register ice class is indicated in brackets according to **2.2.3.3.1** or **2.2.3.3.4** in case of stern-first operation.

**2.2.3.4** The necessary to provide ice reinforcement for the ship is determined by the ship-owner depending on the expected operating conditions with the subsequent fulfillment of the applicable requirements of the Register Rules.

#### **2.2.4 Subdivision distinguishing marks.**

**2.2.4.1** Ships complying with the applicable requirements of Part V "Subdivision" and fully complying with the requirements of Section 2 of the above Part regarding the probabilistic assessment subdivision, are assigned distinguishing mark **R** with value added to it (tenth and hundredth digits) with the required subdivision index, for example, **R68** – for subdivision index 0,68.

Ships complying with the applicable requirements of Part V "Subdivision" and fully complying with the requirements of Section 3 of the above Part in the case of flooding of any one compartment or any two or three adjacent compartments over complete length of the ship in the case of design side damage specified in **3.2** are assigned subdivision distinguishing mark **1**, **2** or **3** respectively.

#### **2.2.5 Distinguishing marks for restricted areas of navigation.**

**2.2.5.1** Sea-going ships and mixed navigation ships, complying with these Rules requirements provided for ships operating only in restricted areas of navigation are assigned one of the following distinguishing marks:

**.1 R1** – navigation in sea areas at seas with a wave height of 8,5 m with 3 % probability of exceeding level and with the ships proceeding not more than 200 miles away from the place of refuge and with an allowable distance between the places of refuge not more than 400 miles;

**.2 R2** – navigation in sea areas at seas with a wave height of 7,0 m with 3 % probability of exceeding level with ships proceeding not more than 100 miles away from the place of refuge and with an allowable distance between the places of refuge not more than 200 miles;

**.3 R2-S** – sea and **R2-RS** river-sea navigation at seas with a wave height of 6,0 m with 3 % probability of exceeding level with ships proceeding from the place of refuge:

in open seas up to 50 miles and with an allowable distance between the places of refuge not more than 100 miles;

in enclosed seas up to 100 miles and with an allowable distance between the places of refuge not more than 200 miles.

**R2-S(5.0)**, **R2-RS(4.5)** - river-sea navigation at seas with a wave height of 4,5 m with 3 % probability with ships proceeding from the place of refuge

Navigation areas of the vessel of mixed (sea-river) navigation with sign **R2-RS** comply under Chapter 20V of Resolution №61 UNECE with zones **RS 6,0** with restricted sailing in rough seas with wave height of 3% provided to 6,0m and **RS 4.5** with set sailing restrictions when sailing on rough seas with wave height of 3% provided to 4,5m;

**.4 R3-S** – sea and **R3-RS** – mixed (sea-river) navigation in rough seas with wave height of 3% provided 3,5m, taking into account the specific constraints caused by wind-wave modes of areas area, season and navigation conditions (refer to **2.2.5.3**), with maximum established distance from the place of shelter, which must not exceed 50 miles. The distance from the place of refuge (refer to Information on Places of refuge) can be increased in the enclosed seas up to 100 miles for a specific voyage provided favourable weather forecast, confirming that the ship established navigation restrictions are not exceeded, for the whole time of the ship's passage between places of refuge, taking into account the influence of forecast wave and wind direction on the speed of the ship and characteristics of the place (places) of refuge for the vessel on its passage depending on the wind directions. The ship shall navigate within area of coastal VHF / DSC radio installations if the ship is fitted with the radio equipment for A1 area or/ within the area of coastal MF / DSC radio installations if the ship is fitted with the radio equipment for A1 and A2 areas (highlighted in bold is entered in the section permanent restrictions of the ship, which has no greater (smaller in value) than the above navigation conditions restrictions).

Navigation areas of the vessel of mixed (sea-river) navigation with sign **R3-RS** comply under Chapter 20V of Resolution №61 UNECE with zone **RS 3,5** with restricted sailing in rough seas with wave height of 3%

provided to 3,5m and geographical and seasonal restrictions and conditions of maritime navigation according to Table 2.2.5.3-1 for sign **R3-S**;

.5 For passenger sea and sea-river navigation ships engaged on domestic voyages, except vessels, to which Directive 2009/45 / EC is not applied the following signs and restrictions appropriate to each sign are established:

.5.1 **A** – navigation outside the area of navigation of vessels in with area restriction **B-R3-S**, **C-R3-S** and **D-R3-S** without additional limiting restrictions and restrictions of wave mode -unlimited navigation area;

.5.2 **A-R1** – navigation in conditions with waves height up to 3% provided 8,5m outside the area of navigation of vessels with area restrictions **B-R3-S**, **C-R3-S** and **D-R3-S**, with distance from place of refuge not more than 200 miles and allowable distance between places of refuge not more than 400 miles;

.5.3 **A-R2** – navigation in conditions with waves height up to 3% provided 7,0m outside the area of navigation of vessels with area restrictions **B-R3-S**, **C-R3-S** and **D-R3-S**, with distance from shelter place not more than 100 miles and allowable distance between places of refuge not more than 200 miles;

.5.4 **A-R2-S** – sea and **A-R2-RS** – mixed (sea-river) navigation in conditions with waves height up to 3% provided 6,0m outside the area of navigation of vessels with area restrictions **B-R3-S**, **C-R3-S** i **D-R3-S**, with distance from the place of refuge:

in open seas up to 50 miles and with an allowable distance between the places of refuge not more than 100 miles;

in enclosed seas up to 100 miles and with an allowable distance between the places of refuge not more than 200 miles.

Navigation areas of a vessel of mixed (sea-river) navigation with sign **A-R2-RS** comply under Chapter 20V of Resolution №61 UNECE with area **RS 6,0**;

.5.5 **B-R3-S** – sea and **B-R3-RS** – mixed (sea-river) navigation in conditions with waves height up to 3% provided 3,5m or more (a specific wave height 6,0m may be set) in which the vessel is not moved off shore more than 20 miles, with the average height of the tide, where the person affected by the accident with the ship can land on the shore, and no more than 50 miles from the place of refuge.

Navigation areas of a vessel of mixed (sea-river) navigation with sign **B-R3-RS** comply under Chapter 20V Resolution №61 UNECE with area **RS 4,5** with restricted sailing in rough seas with wave height of 3% provided to 4,5m and area **RS 3,5** with restricted sailing in rough seas with wave height of 3% provided to 3,5m and establishment for both areas of the specified above distance from the coast and place of refuge, and the establishment by the Flag State in accordance with Article 4 (2) of Directive 2009/45 / EC of maritime areas falling within its jurisdiction, with geographical and seasonal restrictions, which are within the jurisdiction of Ukraine specified in 2.2.5.4 for the sign **B-R3-S**;

.5.6 **C-R3-S** – sea and **C-R3-RS** - mixed (sea-river) navigation in sea areas where the probability of exceeding (frequency) significant waves height of 2.5 m or waves of 3% provided with height 3,3m is less than 10% in one year period of the operation of the vessel throughout the year, or within a specified limited period of the year for operation exclusively in this period (e.g. summer operation period), in which the vessel is not moved off more than 15 miles from the place of shelter and no more than five miles from coastline, corresponding to the average height of the tide, where the person affected by the accident with the ship can land on the coast.

Navigation areas of the vessel of mixed (sea-river) navigation with sign **C-R3-RS** comply under Chapter 20V of Resolution №61 UNECE with area **RS 3,5** with restricted sailing in rough seas with wave height of 3% provided to 3,3m and area **RS 3,0** with restricted sailing in rough seas with wave height of 3% provided to 3,3m and establishing for both areas specified above distance from the coast and place of refuge, and the establishment by the Flag State in accordance with Article 4 (2) of Directive 2009/45 / EC of maritime areas falling within its jurisdiction, with geographical and seasonal restrictions, which are within the jurisdiction of Ukraine specified in 2.2.5.4 for the sign **C-R3-S**;

.5.7 **D-R3-S** – sea and **D-R3-RS** – mixed (sea-river) navigation in sea areas where the probability of exceeding (frequency) significant wave height of 1.5 m or waves of 3% provided with height of 2, 0m is less than 10% over one-year period in the operation of the vessel throughout the year, or within a specified limited period of the year for operation exclusively in this period (e.g. summer operation period), in which the vessel is not moved off for more than 6 miles from the place of shelter and not more than 3 miles from the coastline, which corresponds to the average height of the tide, where the person affected by the accident with the ship can land on the coast.

Navigation areas of the vessel of mixed (sea-river) navigation with sign **D-R3-RS** comply under Chapter 20V of Resolution №61 UNECE with area **RS 2,0** with restricted sailing in rough seas with wave height of 3% provided to 2.0 m and establishing the specified above distance from the shore and place of refuge, and the



establishment by the Flag State in accordance with Article 4 (2) of Directive 2009/45 / EC of maritime areas falling within its jurisdiction, with geographical and seasonal restrictions, which are within the jurisdiction of Ukraine specified in 2.2.5.4 for the sign **D-R3-S**.

For passenger ships with length less than 24m restricted navigation area **D-R3-S** or **D-R3-RS**, refer to 3.9.2.1, Part IV «Stability» these Rules.

High-speed passenger craft, are assigned area and navigation conditions restrictions in accordance with the "Rules for the Classification and Construction of High-Speed Craft";

**.6 R3** – sea and **R3-IN** – mixed (sea-river) navigation with limiting and seasonal restrictions and offshore and harbor navigation within the limits established by the Register in each case taking into account the conditions of wind-wave regime with probability (repeatability) sea rough with wave height 3 % provided 2.0 m less than 10% over one-year period in the operation of vessels throughout the year or within a specified limited period of the year for operation exclusively in this period.

Specific restrictions for floating cranes (carrying out of loading operations and navigation with the possible transport of cargo on deck and / or hold) are set by the Register in each case;

**.7 Berth-connected ship** – For ships outside Ukraine) -berth-connected vessels (indicating the coordinates of the place of mooring and geographic area of operation according to Fig. 4.3.3.6 of Part IV «Stability» of these Rules.

**2.2.5.2** Restrictions provided in 2.2.5.1 determine allowable operating conditions of the vessel, due to her stability and strength that are listed in Classification certificate and a Certificate of seaworthiness.

**2.2.5.3** Specific restrictions on the area and conditions of navigation at sea for vessels with signs restricting navigation area **R3-S** and **R3-RS** are set as a geographic name of areas or their parts indicating where appropriate the geographical boundaries of the area inside the area of navigation, restrictions on the distance from the place of shelter and operational restrictions by calendar terms, or as indicating a voyage between end ports. Thus for setting restrictions that take into account wind-wave regimes of sea areas are used data of the Table 2.2.5.3-1 or data from provided for the Register backgrounds for ability to operate the ship within a certain area or in voyage, made by the method approved by the Register, including restriction of navigation conditions exceeding specified in **2.2.5.1.4**, e.g.  $h_{3\%} \leq 3,0$  m.

**Table 2.2.5.3-1 Geographical and seasonal restrictions for navigation**

Basin	Geographical restrictions	Navigation season
1	2	3
The Sea of Azov	Without restrictions	Throughout the year
The Black Sea	20-mile coastal area along the northern, western and eastern coasts from the port of Batumi to the Strait of Bosphorus	Throughout the year
The Sea of Marmora	No restrictions from Bosphorus to Dardanelles Straits	Throughout the year
The Aegean Sea	From the Dardanelles to Karpathos and Kithira Straits to the north of 36°N; Passage to the Ionian Sea through the Gulf of Saronikos, Corinth Canal, Gulf of Corinth, Gulf of Patraikos	Throughout the year
The Ionian Sea	The Gulf of Corinth; the Gulf of Patraikos; 20-mile coastal area from the Gulf of Patraikos to the Strait of Otranto; the Strait of Otranto	Throughout the year
The Adriatic Sea	To the south of 42°N, 20-mile coastal area along the eastern and western coasts, crossing the sea in the Strait of Otranto in the area of the port of Brindizi (the port of Bari) _ the port of Bar, as well as in the area of Cape San Francesco _ Lastovo Island; 40-mile coastal area to the north of 42°N, along the eastern coast with calling at ports of the western coast	Throughout the year
Eastern part of the Mediterranean Sea	20-mile coastal area along the eastern coast from Rhodes Strait to the ports of Izrael inclusive with calls at the ports of Cyprus Island	April _ November
The Mediterranean Sea	20-mile coastal area along the eastern coast from Rhodes Strait to the ports of Izrael inclusive with calls at the ports of Cyprus Island	March _ November
The Baltic Sea	No restrictions, including the Gulf of Bothnia, the Gulf of Finland and the Gulf of Riga; the Strait of Zund, the Great Belt and the Little Belt Straits, the Kattegat Strait to the south of 57°45'N	Throughout the year
The Persian Gulf (the Arabian Sea)	Eastern part: from Ormus Strait to 54°E; central part: the coastal area along the western coast in the area restricted by 54°E, parallel 28°59'N and a line connecting islands Abu-Musa, Khalul, Al-Kharkus, Failaka; northern part: from parallel 28°59'N	Throughout the year
<sup>1</sup> Geographical and seasonal restrictions for navigation in the Baltic, White, Kara, Caspian, Okhotsk, North, East Siberian and Japanese Seas and the Laptev Sea are established by the Register at the request of the designer / shipowner separately.		

**2.2.5.4** For passenger sea-going ships engaged in inland navigaton, in accordance with Article 4 paragraph 2 of Directive 2009/45 / EC, each Flag State shall establish and update, if necessary, a list of sea areas under its jurisdiction, restricting the areas for year-round operation and, where expediently, zones with year-on-year restrictions for ship classes, applying the criteria for area restriction set out in **2.2.5.1.5**. On the basis of the specified list of sea areas, restrictions on areas and navigation conditions of a particular ship are established, depending on the sign in accordance with **2.2.5.1.5**.

### **2.2.6 Distinguishing automation marks.**

**2.2.6.1** Sea and mixed sea-river navigation ships and floating facilities fitted with automation equipment complying with the requirements of Part XV "Automation" are assigned one of the following distinguishing marks added to the character of classification, namely:

**.1 AUT1** — where the automation extent is sufficient for the machinery installation operation with unattended machinery spaces and the main machinery control room;

**.2 AUT2** — where the automation extent is sufficient for the machinery installation operation by one operator at the main machinery control room with unattended machinery spaces;

**.3 AUT3** — \_ where the automation extent is sufficient for the machinery installation operation of a ship with the main machinery power output not more than 2250 kW with unattended machinery spaces and the main machinery control room;

**.4 AUT1-C, AUT2-C or AUT3-C** — where automation is based on computers or programmable logic controllers meeting the requirements of Section 7, Part XV "Automation" of these Rules;

**.5 AUT1-ICS, AUT2-ICS or AUT3-ICS** — where automation is made with the use of a computerized integrated monitoring and control system meeting the requirements of Section 7, Part XV "Automation".

#### **2.2.6.2 Automatic stabilization destinguishing mark.**

If a high-speed craft is equipped with automatic or semi-automatic stabilization system and the ship cannot move in operational mode without this system, the **stab** distinguishing mark is added the character of classification after the marks indicated in **2.2.6.1**.

### **2.2.7 Distinguishing mark of one man bridge operated ship.**

If the navigational equipment of self-propelled sea-going or sea-river navigaton ship installed on the navigation bridge provides possibility for self-propelled one man bridge operated ships, a distinguishing mark **NAV-1** is added to the character of classification.

### **2.2.8 Distinguishing mark for a ship carrying equipment for fire fighting aboard other ships.**

If a ship carries supplementary systems, equipment and outfit for fire fighting aboard other ships, offshore drilling units, floating and shore facilities and if the ship is in full compliance with the relevant requirements of these Rules in respect to those appliances, distinguishing marks **FF1WS**, **FF1**, **FF2WS**, **FF2** or **FF3WS**, **FF3** are added to the character of classification proceeding from the degree of the ship equipment with these appliances.

The degree of the ship's equipment for fire fighting aboard other ships is determined by the composition of fire-fighting systems and equipment assigned in **6.6**, Part VI "Fire Protection" of these Rules.

### **2.2.9 Distinguishing mark for ships fitted with a dynamic positioning system.**

If a ship is fitted with a dynamic positioning system complying with the requirements of Section 8, Part XV "Automation", one of the following distinguishing marks: **DP1**, **DP2** or **DP3** is added to the ship's character of classification, depending on the redundancy of the dynamic positioning system.

### **2.2.10 Distinguishing mark for ships fitted with position mooring systems.**

If a self-propelled sea-going or sea-river ship is fitted with the position mooring system, one of the following distinguishing marks is added to the character of classification:

**.1 POSMOOR** – if the position mooring system meets the requirements of **9.1 - 9.3**, Part XV "Automation";

**.2 POSMOOR-TA** – if the position mooring system meets the requirements of **9.1 - 9.4**, Part XV "Automation" when applying thrusters complying with the applicable requirements of Section 8, Part XV "Automation".

### **2.2.11 Distinguishing mark for a ship intended for carriage of refrigerated cargo.**

Ships intended for carriage or storage of refrigerated cargo or catch in ship's cargo spaces and/or in thermal containers with the use of a refrigerating plant available on board and classed in compliance with Section 4 of this Part and meeting the requirements of Part XII "Refrigerating Plants" are assigned the distinguishing mark **REF** added to the character of classification.

Ships intended for carriage or storage of refrigerated cargo or catch in ship's cargo spaces and/or in thermal containers and using non-classed refrigerating plant for maintaining the required temperature, complying with the relevant requirements of Part XII "Refrigerating Plants", are assigned the distinguishing mark (**REF**) added to the character of classification.

### **2.2.12 Distinguishing mark for ships fitted with the main electric propulsion plant.**

If a ship is fitted with the main electric propulsion plant complying with the requirements of Section 17, Part XI "Electrical Equipment", the distinguishing mark **EPP** is added to the character of classification.

### **2.2.13 Distinguishing mark for ships fitted with equipment for icing protection.**

If a ship is fitted with equipment providing effective icing protection in compliance with the requirements of **10** Part III «Equipment, arrangements and outfit» the distinguishing mark **DEICE** is added to the character of classification.

The distinguishing mark **DEICE** may be assigned either to ship in construction or operation.

### **2.2.14 Distinguishing mark for ships fit for carriage of dangerous goods.**

If a ship complies with the requirements of **7.2**, Part VI "Fire Protection" of these Rules, the distinguishing mark **DG** is added to the character of classification with the following specified in brackets depending on the type of dangerous goods: (**bulk**) - in bulk, (**pack**) - packaged.

Ships intended for carriage of packaged irradiated nuclear fuel, plutonium and high-level radioactive wastes, which comply with the requirements of **7.3**, Part VI "Fire Protection" are assigned one of the following distinguishing marks added to the character of classification:

**INF1** for Class **INF1** ships;

**INF2** for Class **INF2** ships;

**INF3** for Class **INF3** ships.

### 2.2.15 Distinguishing mark for ships fitted with a loading instrument.

If a ship is fitted with a loading instrument complying with the requirements of 1.4.4.4 and Appendix 2, Part II "Hull", the distinguishing mark **LI** is added to the character of classification.

### 2.2.16 Distinguishing mark for ships fitted with a cargo vapour discharge system.

If a sea going or sea river navigaton ship is fitted with a cargo vapour discharge system complying with the requirements of 9.9, Part VIII "Systems and Piping" the distinguishing mark **VCS** is added to the character of classification.

### 2.2.17 Distinguishing mark for ships fitted with an inert gas system.

If a sea-going or sea river navigaton ship is fitted d with an inert gas system complying with the requirements of 9.16, Part VIII "Systems and Piping", one of the following distinguishing marks is added to the character of classification:

**.1 IGS-IG** – if a system uses an oil-burning inert gas generator as the inert gas source and the requirements of 9.16.9, Part VIII "Systems and Piping" are complied with;

**.2 IGS-NG** – if a system uses a nitrogen generator as the inert gas source and the requirements of 9.16.12, Part VIII "Systems and Piping" are complied with;

**.3 IGS-Pad** - if an inert gas system is only intended for forming an insulating pad in cargo tanks and the requirements of 9.16.11, Part VIII "Systems and Piping" are complied with. This distinguishing mark may be used where systems with inert gas supplied from cylinders are installed as well as for systems using inert gas and nitrogen generators whose capacity is insufficient for assigning the distinguishing marks **IGS-IG** or **IGS-NG**.

### 2.2.18 Distinguishing mark for ships fitted with a crude oil washing system.

If a sea-going or sea rivet navigaton ship is fitted with a crude oil washing system complying with the requirements of 9.12, Part VIII "Systems and Piping", the distinguishing mark **COW** is added to the character of classification.

### 2.2.19 Distinguishing mark for ships fitted with a centralized cargo control system.

If a sea-going or sea river navigaton ship is fitted with a cargo control room complying with the requirements of 3.2.11, Part VII "Machinery Installations", the distinguishing mark **CCO** is added to the character of classification.

### 2.2.20 Distinguishing marks for ships of high ecological safety.

Ships complying with the requirements of Annexes I-VI of MARPOL-73/78/97 – The International Convention for the Prevention of Pollution from Ships, 1973, as modified by the Protocol of 1978, (MARPOL-73/78) as amended by the Protocol of 1997 (MARPOL-73/78/97) **ECO** and **ECO-S** marks in the character of classification are assigned with one of the following distinguishing marks added to the character of classification:

**.1 ECO** is a mark in the class symbol that indicates compliance with the basic requirements for the control and limitation of operational emissions and discharges, for harmful antifouling systems, and for requirements aimed at preventing environmental pollution in emergency situations. ;

**.2 ECO-S** is a mark in a class symbol that indicates compliance with stricter requirements than those for the award of the ECO mark in a class symbol.

It is recommended that the following ships be awarded the **ECO** and **ECO-S** marks in the class symbol:

**ECO** - for ships under construction and existing ships;

**ECO-S** - for ships under construction, existing passenger ships, ships of restricted areas of navigation and ships of sea-river navigation.

### 2.2.21 Distinguishing mark for a ship complying with ballast water management requirements.

If a sea-going or mixed navigaton ship performs ballast water management through ballast water exchange at sea and, as appropriate, carries the Guidelines for Safe Ballast Water Exchange at Sea, which complies with the requirements of 1.4.13, Part IV "Stability" of these Rules, , and the ship ballast system complies with the requirements of 8.7, Part VIII "Systems and Piping" of these Rules, one of the following distinguishing marks is added to the character of classification: **BWM (E-S)**, **BWM (E-F)**, **BWM (E-D)**, **BWM (E-SF)**, **BWM (E-SD)**, **BWM (E-FD)** or **BWM (E-SFD)**. **BWM** means that the ship performs ballast water management; **E** means that ballast water management is performed through ballast water exchange at sea; **S** means that sequential method is used; **F** means that flow-through method is used; **D** means that dilution method is used; **SF**, **SD**, **FD** and **SFD** mean that combined ballast water exchange method is used being a combination of the above methods.

*Note:* The above marks shall not be applicable to ships laid down or in a similar stage of construction on or after 8 September 2017 in accordance with revised regulation B-3 of the BWM Convention, 2004 and may be applied to ships laid down or in a similar stage of construction before 8 September 2017 and shall be retained in the class symbol of such ships until the date when the ship shall comply with regulation D-2 of the BWM Convention, 2004 but not later than 8 September 2024.

If a sea-going or sea rivet navigaton ship is fitted with ballast water management system that meets the requirements of the International Convention for the Control and Management of Ships' Ballast Water and Sediments of 2004 with the implementation of the D2 standard (by treating ballast water) and has a type approval from the Administration, and accordingly has a Ballast Water Management Plan developed in accordance with the provisions of resolution MEPC.127 (53), and the ballast systems of the ship meet the requirements of **8.8**, Part VIII "Systems and Piping" of these these Rules, then the distnguishing **mark BWM (T2)** is added to the character of classification.

The BWM mark means that the ship manages ballast water in accordance with an approved Ballast Water Management Plan that meets the requirements of regulation B-1 of the BWM Convention, and T means that ballast water is managed by treating ballast water with an approved BWMS in accordance with the requirements of the ballast water quality standard as specified in regulation D-2 of the BWM Convention.

#### **2.2.22 Reserved**

#### **2.2.23 Reserved.**

#### **2.2.24 Distinguishing mark for a ship to carry out cargo operations at offshore terminals.**

On tankers equipped to carry cargo operations at offshore terminals in accordance with the requirements of Annex I of MARPOL-73/78/97 – The International Convention for the Prevention of Pollution from Ships, 1973, as modified by the Protocol of 1978, (MARPOL-73/78) as amended by the Protocol of 1997 (MARPOL-73/78/97), are assigned one of the following distinguishing marks added to the character of classification:

**.1 BLS – SPM** – if a ship is fitted with the bow loading system and fully complies with the requirements for equipment of oil tankers to carry out cargo operations at offshore terminals in accordance with requirements of above mentioned Annex I ;

**.2 BLS** – if a ship is fitted with the bow loading system and partly complies with the requirements for equipment of oil tankers to carry out cargo operations at offshore terminals, in accordance with requirements of above mentioned Annex I;

**.3 SPM** – if a ship is not fitted with the bow loading system, though complies with the requirements for equipment of oil tankers to carry cargo operations at offshore terminals in accordance with requirements of above mentioned Annex I».

#### **2.2.25 Distinguishing mark for a ship fitted with helicopter facilities.**

Sea and sea-river navigation ship, equipped with helicopter facilities in accordance with requirements of section 11 «Requirements to ships equipment with helicopter facilities» of part III «Gears, equipment and supply» of these Rules, one of the following distinguishing marks is added to the character of classification:

**.1 HELIDECK** – if a ship is fitted with a helideck and complies with the requirements of **11.1.2.1**;

**.2 HELIDECK-F** – if a ship is fitted with helicopter refuelling facilities and complies with the requirements of **11.1.2.2**;

**.3 HELIDECK-H** – if a ship is fitted with hangar facilities and fully complies with the requirements of **11.1.2.3**.

The distinguishing marks **HELIDECK**, **HELIDECK-F** or **HELIDECK-H** may be assigned either to ship in construction or operation.

#### **2.2.26 Distinguishing mark for propulsion plant redundancy.**

Where provision is made for the redundancy of propulsion plant components complying with the requirements of **2.7** «Requirements for propulsion plant redundancy», Part VII «Macninery Installations», one of the following distinguishing marks is added to the character of classification: **RP-1**, **RP-1A**, **RP-1AS**, **RP-2** або **RP-2S**, depending on the redundancy arrangement.

#### **2.2.27 Distinguishing mark for a ship equipped to use gas fuel.**

If sea-going ships are equipped for using gas fuel in compliance with **1.1.3**, including **2.10** «General requirements for the design of ships equipped to use gas fuel», Part VII «Macninery Installations» and the requirements of other parts of these Rules specified in **1.1.3.1-1.1.3.3**, Part VII the distinguishing mark **GFS** (gas fuelled ships) is added to the character of classification.

### 2.2.28 Distinguishing mark for a planned maintenance scheme for machinery applied on board the ship.

If a planned maintenance scheme for machinery (**PMS**) is applied on board the ship in compliance with the requirements of **11** and **12**, Part VII «Machinery Installations» of these Rules, at the shipowner's discretion, the distinguishing mark **PMS** (Planned Maintenance Scheme for Machinery) and/or **BMS** (Boiler Monitoring System) may be added to the character of classification.

### 2.2.29 Distinguishing mark for ships fitted for possible carriage of the international standard containers.

If a ship without a descriptive notation **Container ship** in the class notation is fitted for carriage of cargo in international standard containers on deck and/or in appropriate holds, the distinguishing mark **CONT** is added to the character of classification and the container transportation area is specified in brackets (**deck**) (**cargo hold(s) No.**) (for ships not engaged on the international voyages (**deck**) (**cargo hold(s) No.**)).

### 2.2.30 Distinguishing mark for a ship equipped to ensure long-term operation at low temperatures.

If ships are equipped to ensure long-term operation at low temperatures in compliance with the requirements of Rules for the Classification and Construction of Sea-Going Ships, at the shipowner's discretion, the distinguishing mark **WINTERIZATION(DAT)**, is added to the character of classification, where design ambient temperature is indicated in brackets, in Celsius degrees, e.g.: **WINTERIZATION(-40)**.

The following is required for the assignment of a distinguishing mark **WINTERIZATION(DAT)**:

.1 sign of the Polar class or the Baltic ice class **IC...IA Super**, or the Register ice class not lower than **Ice4**, or **Icebreaker** according to **2.2.3**. At the shipowner's discretion, the distinguishing mark **WINTERIZATION(DAT)** may be assigned to Baltic ice class I or ice class Ice3 ship and below, while the scope of these requirements is determined by the Register in agreement with the ship-owner, taking into account the expected operating conditions of the ship and her design features;

.2 the distinguishing mark **DEICE** according to **2.2.13**.

The distinguishing mark **WINTERIZATION(DAT)** may be assigned either to ship in construction or operation.

### 2.2.31 Distinguishing mark for ships fitted with a system of prompt access to computerized shore-based emergency response services (ERS) on damage stability and residual structural strength calculations.

If a ship is fitted with a system of prompt access to computerized shore-based emergency response services (**ERS**) on damage stability and residual structural strength calculations, the distinguishing mark **ERS** may be added to the character of classification.

### 2.2.32 Distinguishing mark confirming fatigue life of a ship.

Where design remaining life of a ship (fatigue life) exceeds 25 years, the distinguishing mark **FTL (years)** may be added to the character of classification, where design remaining life of a ship within the range of 25 - 40 years (at 5-year intervals) is indicated in brackets.

When performing verification by direct calculation with application of spectral method, the distinguishing mark **Spectral North Atlantic** is added after the distinguishing mark **FTL (years)**.

**2.2.33 Reserved.**

**2.2.34 Reserved.**

**2.2.35 Reserved.**

**2.2.36 Reserved.**

### 2.2.37 The descriptive notation in the character of classification.

**2.2.37.1** Sea-going ships that meet the specified volume of these Rules requirements, which take into account the structural features of the ship and the conditions of her operation, the main class symbol of is added with appropriate descriptive notation.

these Rules of the Register contain certain requirements, the implementation of which enables the introduction of these descriptive notation into the character of classification:

**Anchor handling vessel**

**Berth-connected ship**




**Bilge water removing ship**

**Bulk carrierCable laying barge**

**Cable laying vessel**

**Catamaran**  
**Chemical tanker**  
**Container ship**  
**Crane vessel**  
**Crew boat**  
**Docklift ship**  
**Dredger**  
**Escort tug**  
**Fishing vessel**  
**Floating crane**  
**Floating dock**  
**Gas carrier**  
**Hopper barge**  
**Hopper dredger**  
**Oil/bulk carrier**  
**Oil/bulk/ore carrier**  
**Oil recovery ship**  
**Oil tanker**  
**Ore carrier**  
**Passenger ship**  
**Pipe laying barge**  
**Pipe laying vessel**  
**Pontoon**  
**Pontoon for technological services**  
**Pontoon for transportation services**  
**Ro-ro passenger ship**  
**Ro-ro ship**  
**Salvage ship**  
**Self-unloading bulk carrier**  
**Shipborne barge**  
**Special purpose ship**  
**Standby vessel**  
**Supply vessel (other than Supply vessel (OS))**  
**Supply vessel (OS) (FOP/SSP)**  
**Tanker**  
**Tanker (water)**  
**Tanker (wine)**  
**Timber carrier**  
**Tug**  
**WIG craft**  
 and so on.

*Note.* The descriptive notation in a class symbol of the ship, engaged on international voyages, including international routes on inland waterways, is written in English. At the request of the shipowner descriptive notation in a class symbol of the ships specified can be written in two languages: English and other language as like shipowner.

For a passenger ship, where the special needs of persons with reduced mobility concerning safety have been taken into account, the verbal characteristic is supplemented by a sign , e.g. **Passenger ship**  - passenger .

With descriptive notation **Tanker** particular cargo transported by the vessel is indicated in brackets, e.g.: **Tanker (water)**, **Tanker (wine)** etc.

For berth-connected ships **Berth-connected ship** (refer to 2.2.5.1.7) the operating conditions are indicated in parentheses: when moored at quay - (**S, shore**) when lying at a water area distanced from the shore - (**W, waters**), after that a descriptive notation is specified purpose of the vessel listed in the definition of berth-connected ship (see 1.2.1).

If the volume of the Regulation requirements, which the ship meets, allows, two or more descriptive notation such as: **Supply vessel, Salvage ship, Tug** can be written in a class symbol, or descriptive notation may be provided in the form of a combination of shortened words such as: **Cargo/passenger ship**, Oil/bulk carrier, Oil/bulk/ore carrier etc.

If oil tanker or oil recovery ship meets the requirements for ships carrying or recovery oil from the sea surface and transporting petroleum products with a flashpoint above 60 ° C, the temperature indicated in the descriptive notation, e.g. **Oil tanker (>60°C), Oil/ore carrier (>60°C), Oil recovery ship (>60°C)**.

For bulk carriers and oil tankers of 150 m in length and over, which fully complying with the requirements of Part II "Hull" and, for these vessels of unrestricted navigation area, Part XVII "General rules for the construction of bulk carriers and oil tankers" of these Rules, the distinguishing mark **CSR** is added to the character of classification.

On addition the main class symbol with descriptive notation «Bulk carrier» for ships of 150 meters and more in compliance with the relevant requirements of Part II "Hull" and, for those vessels of unrestricted navigation area, of part XVII «General rules for the construction and durability strength of bulk carriers» of these Rules the following distinguishing marks are attached after descriptive notation:

- .1 **BC-A** - for ships designed to carry bulk cargoes with density of 1 t/m<sup>3</sup> and more at the maximum draft of which the holds remain empty;
- .2 **BC-B** - for ships designed to carry bulk cargoes with density of 1 t/m<sup>3</sup> and more, when loading all holds;
- .3 **BC-C** - for ships designed to carry bulk cargoes with density less than 1 t/m<sup>3</sup>.

For bulk carriers, to which class notation symbols **BC-A** and **BC-B** are added, in the section «other characteristics» of the Classification Certificate restrictions, which must be adhered to during operation as a consequence of the loading conditions applicable to the design (refer to 3.3, Part II "Hull" or 3.1.3, Section 1, Chapter XVIII, Part 1 of "General Rules for the Design and Strength of Bulk Ships", as applicable) must be recorded in detail in the following cases:

for **BC-A** or **BC-B** signs the entry (**maximum cargo density... t/m<sup>3</sup>**) is entered if the maximum load density is less than 3.0 t/m<sup>3</sup>;

for **BC-A** sign, in addition, allowable combination of determined empty cargo holds is recorded, eg, (**cargo holds Nos. 2, 4, ... may be empty**);

For **BC-A** sign, if the ship is intended for use in alternate block load condition, record (**block loading**) is made.

If the ship was not originally designed for loading and unloading in several ports, a distinguishing mark (**no MP**) is added after all these signs.

For bulk carriers, with distinguishing mark **BC-A** or **BC-B** in the character of classification, which cargo holds are designed for loading/unloading using grabs with weight of each 20 tonnes or more in accordance with the requirements of Section 1 of Chapter 12 of Part XVIII «General rules for construction and strength of bulk carriers" of these Rules, after the said distinguishing mark is attached sign **GRAB (X)**, where instead of X, the weight of an empty grab of not less than:

- 35 t for ships with length  $L \geq 250$  m;
- 30 t for ships with length  $200 \text{ m} \leq L < 250$  m;
- 20 t in other cases is indicated

For all other bulk carriers addition of **GRAB (X)** distinguishing mark is voluntary.

On addition to the character of classification of self-propelled ships of descriptive notation «Chemical tanker», «Oil tanker», «Bulk carrier», «Ore carrier» or combinations of words («Oil/bulk carrier», «Oil/ore carrier» etc.) after descriptive notation is necessarily added: (**ESP**), indicating the need to provide these vessels for expanded program surveys. For example **Oil/ore carrier (>60°C)(ESP)**.

Descriptive notation **Escort tug** is attached to character of classification of tugs that meet the requirements of section 9 "Requirements concerning tugs for escort operations" of part III «Equipment, arrangements and outfit" of these Rules.

Gas carriers transporting liquefied natural gas (LNG) and designed to provide the transfer of LNG to ships



using LNG as fuel (hereinafter referred to as LNG bunkering ships), a descriptive notation **LNG bunkering ship** is added after the descriptive notation **Gas carrier** into the character of classification.

If an LNG bunkering ship has additional functions related to servicing ships using LNG as fuel and the vessel, one (or more) of the following distinguishing marks: **RE**, **Ig-supply**, **BOG** is added to the character of classification after the descriptive notation **LNG bunkering ship**.

**2.2.37.2** If a sea and sea river navigation non-passenger ship (pleasure, crew, etc.) intended for the carriage of passengers is used for the commercial carriage of passengers (refer to **1.2.1.1** the definition of "Commercial carriage of passengers -"), the descriptive notation of such a ship is supplemented with the distinguishing mark (**K**), for example, **pleasure (K)**.

### **2.2.38 Restriction of certain signs action.**

If the implementation of a certain volume of requirements of the Rules, required for the introduction of the relevant signs into the class symbol, is confirmed only when the restrictions are set by the Register, after the class symbol in brackets the following signs and conditions are indicated, under which abuse these signs expire, for example **KM ⊕ Ice6 (hull at  $d \leq 8,4m$ ; machinery) ⊞ (at  $d \leq 8,4m$ ) AUT2 Ro-ro ship.**

At the request of the shipowner, when establishing the ice class restriction, the maximum draft in fresh water at which the Register requirements for the specified ice class are met, for example **Ice6 (hull at  $d/d_f \leq 6,0m/6,15m$ ; machinery)**, where  $d_f$  - maximum draft in fresh water at which the ice class requirements are met, which is defined as the sum of the draft  $d$  and corrections for fresh water.

## **2.3 ADDITIONAL ENTRIES**

**2.3.1** When complying with definite requirements of the Register rules stipulated by the structural features or operational characteristics of the ship the fulfilment of which is not reflected by distinguishing marks and descriptive notation in the class notation, the confirmation of compliance of the ship with such requirements is certified by the entry in Section "Other characteristics" of the Classification Certificate stating, for example: that the ship is equipped for occasional loading/unloading of cargoes in a horizontal direction; the ship may operate in oil harbour water areas etc. (refer also to **1.1.4.8**, **1.1.5.1**, **1.1.5.2**, **3.3.1.5**, **3.10.4.1**, **3.11.1.1.2** and **3.12.4.3.2**, Part II "Hull").

**2.3.2** Section "Other characteristics" of the Classification Certificate for **supply vessels (OS)** and other ships serving offshore oil and gas fields (except for mobile offshore drilling units, floating cranes, pipelaying barges and floating hotels), which comply with the requirements of the Code for the Transport and Handling of Hazardous and Noxious Liquid Substances in Bulk on Offshore Support Vessels (OSV Chemical Code), IMO resolution A.1122(30), shall have an entry reading as follows: "The ship is fit to carry hazardous and noxious liquid substances in bulk, as stated in the Certificate of Fitness" (**Supply vessel (OS)**).

## **2.4 CHANGE OF CLASS NOTATIONS**

**2.4.1** The Register may exclude or change appropriate distinguishing mark in the character of classification in case of change or violation of conditions that were the basis for the introduction of the distinguishing mark into the character of classification.

# **3. ADDITIONAL PROVISIONS**

**3.1 Reserved.**

**3.2 Reserved.**

**3.3 Reserved.**

## 4. TECHNICAL DOCUMENTATION

### 4.1 GENERAL

**4.1.1** General provisions pertinent to the review and approval (agreement) of technical documentation on ships, materials and products are given in appropriate Rules for Technical Supervision during Construction of Ships and Manufacture of Materials and Products for Ships.

**4.1.2** This part of the Rules specifies the design documents of the ship in construction (plan approval documentation), submitted to the Register for examination and approval.

**4.1.3** Requirements for the scope of technical documentation of a ship under conversion, repair or renovation, transfer of class, as well as during the initial survey of ship not built under the technical supervision of the Register or another classification society, are given in General Survey Provisions and in 4.4 of this Part.

At the same time, technical documentation for conversion of sea and mixed (sea-river and river-sea) navigation single-hull tankers to double-hull tankers or bulk carriers shall meet the relevant requirements of these Rules taking into account IACS UI SC226 (Rev.1 Dec 2012) (published at IACS site).

**4.1.4** Requirements for the scope of technical documentation of materials and products for ships, which are objects of technical supervision of the Register are given in applicable General Survey Provisions and appropriate Parts of these Rules.

Technical documentation for materials and products shall be submitted prior to their manufacture for the Register technical supervision over their production, testing and certification prior to their installation on the ship. Upon presentation of a material or product without a certificate of the Register or the organization, recognized by the Register, the material or the product to be installed on the ship shall be certified with the providing of the specified technical documentation and tests carry out in accordance with the main sample acceptance program.

Agreed with the Register standards for certain materials and products can replace the relevant part of the documentation or documentation in general.

**4.1.5** The scope of technical documentation for the construction of vessels and manufacture of materials and products provided in this part of the Rules shall be amendment with taking into account the requirements of applicable requirements of following Rules and Regulations:

- .1 Regulations for the Measurement of Tonnage for the Suez Canal;
- .2 Rules for Measurement of Vessels for the Panama Canal;
- .3 other external normative documents approved by the Register.

**4.1.6** Technical documentation in accordance with the requirements of applicable to the ship conventions and codes is provided to the ships subject to International Conventions and Codes.

**4.1.7** When alternative design and arrangements being applied on board (refer to 1.2.2), deviate from the classification requirements and are allowed by Reg. II-1/55, II-2/17 and III/38 SOLAS, a *Technical Analysis* shall be submitted for approval by the Register with technical justification demonstrating that the alternative design and arrangements provide an equivalent level of safety to that stipulated by the applicable requirements of SOLAS.

*Technical Analysis* shall be carried out and provided for the examination and approval of the Register with subsequent providing to ship Flag State Administration under the provisions of the Guidance alternative design and arrangements (refer to IMO MSC/Circ.1002 3 Coord.1, Coord.2, Coord.3 i MSC.1/Circ.1552 and MSC.1/Circ.1212/Rev.1), taking into account Guidelines for the approval of alternatives and equivalents, adopted by MSC.1/Circ.1455.

When alternative design and arrangements being applied on board, deviate from the classification requirements of the Register rules, an engineering analysis shall be submitted for approval by the Register with technical justification demonstrating that the alternative design and arrangements provide an equivalent level of safety to that stipulated by the Register requirements.

**4.1.8** Evacuation analyses for passenger ships.

Escape routes shall be evaluated early in the design process using evacuation analysis (refer to 4.2.4.17 or 4.2.2.2). This analysis is performed for:

- .1 ro-ro passenger ships, which are under construction on 01.07.1999 or after this date; and
- .2 passenger ships other than ro-ro passenger ships constructed on or after 1 January 2020 carrying more than 36 passengers.

The analysis is used to identify and eliminate, as far as possible, the congestion that may arise when the ship is abandoned as a result of the movement of passengers and crew along escape routes, including the likelihood that crew members will have to move along these routes in the opposite direction. In addition, this analysis shall

be applied to demonstrate that the evacuation arrangements are flexible enough to allow that some escape routes, muster stations, embarkation stations or life-boats and rafts could be damaged as a result of an accident. The analysis is in accordance with the provisions of the IMO circular "Guidelines for evacuation analysis for new and existing passenger ships" (MSC.1 / Circ.1533), as amended.

## 4.2 DESIGN DOCUMENTATION FOR A SHIP UNDER CONSTRUCTION

### 4.2.1 General.

Prior to the commencement of a ship construction, technical documentation (plan approval documentation), яка дозволяє переконатися, proving that all requirements of the Register applicable to the ship concerned are complied with shall be submitted to the Register for review, as a rule, completed according to the following list, taking into account features and type of ship.

In case of absence (not required and not provided by the Rules) on the vessel of appropriate structures, mechanisms, devices, systems, equipment and supply, their technical documentation is not provided for the Register. In case of presence on the vessel of specific constructions, mechanisms, devices, systems, equipment and supply, which are not subject to supervision of the Register, the technical documentation for them is submitted to the Register to the extent necessary to comply with the Rules on such constructions, machinery, devices, systems, equipment and outfit.

The Register may require submission of additional documentation in the absence in documentation submitted confirmation that all the requirements of the Rules have been carried out.

On positive results of examination the design documentation is approved or, for documents, which names in the lists are specified with a sign «(\*)», is taken into account, or for documents in the lists next to the name of which the sign «(\*\*)» is indicated, for information, with putting appropriate stamp.

Register approval of design documentation does not apply to vessel's elements, structures and equipment provided for therein, but are not objects of the Register's technical supervision and which are not subject to the requirements of the Rules; approval of documents does not confirm their compliance with requirements applied in their development, other than the requirements of the rules and regulations of the Register and agreed with the Register normative documents in part regulated by them.

### 4.2.2 General:

#### .1 ship specification (\*).

Section "Radio Equipment" of general specification of vessels operated at sea and on navigable sea routes of inland waterways (INV), should contain information about the sea navigation area (concerning radio equipment) and navigation area on INS and for ships with sea (concerning radio equipment) navigation area - maintenance of radio equipment in accordance with the requirements of the Global Maritime Distress and Safety System (GMDSS).

General passenger ship specifications shall include information about the availability of cabins equipped for persons with reduced mobility.

#### .2 general arrangement plan; drawings of an overall plan safety center (for passenger ships).

For vessel with bifuel engine (with distinguishing mark **GFS** in character of classification) drawings of general location of the vessel indicating the location of:

- storage tanks for gaseous fuels (GST) and any openings in them;
- storage facilities and fuel preparation and any openings that lead to them;
- doors, hatches and any other openings leading to explosive spaces and spaces;
- vapor tubes and places of air inflow and exhaust of explosive areas and spaces ventilation system; - doors, skylights, vestibules, ducts exits and other openings in rooms adjacent to the explosive zones;

.3 list of standard equipment, systems, gears and materials that are the objects of technical supervision of the Register (\*) in accordance with nomenclature of the Rules of technical supervision over the construction of ships and manufacture of materials and products containing data on:

- type and basic technical data;
- manufacturing enterprise;
- reliability (only for systems, devices, instrumentation and automation elements);
- approval by the Register or by other competent authority, recognized by the Register;

#### .4 drawings of explosive zones, spaces and premises (only for tankers and oil recovery ships);

#### .5 Reserved

.6 list of operational activities performed by the shipowner during the preparation of the oil recovery ship for operations to rectify the oil spill;

.7 list of measures and technical solutions that provide electrostatic and galvanic intrinsic safety (if required by the Rules), including description and layout of constructive facilities and equipment used for such purposes;

.8 plan showing the position of the IMO number on board a ship in compliance with the requirements of regulation XI-1/3 of SOLAS-74/04 (for ships engaged in sea voyages, all passenger ships of 100 gross tonnage and above and for all cargo ships of 300 gross tonnage and above);

.9 Reserved;

.10 Reserved;

.11 List of deviations from the VRS rules ((list of available in the design decisions on structures, materials and products that differ from regulated by the Rules, with grounding of their use).

The grounding displays: the requirements of the rules on the design, material or product that is replaced, used on the ship construction, material and product grounding of equivalent replacement, decision taken, confirming an equivalent level of safety when replacing;

.12 *Technical analysis* equivalents and / or alternative designs and equipment/ *engineering analysis* (refer to 4.1.7) - in the event of their use (\*);

.13 for ships with distinguishing marks of propulsion installation redundancy **RP-1, RP-1A, RP-1AS, RP-2** and **RP-2S** (for passenger ship) (which is applicable):

.1 calculations showing that in case of a single failure the ship maintains progress and control in accordance with the requirements of 2.7.5.3, Part VII «Machinery installation" of these Rules (for ships with distinguishing marks **RP-1A, RP-1AS, RP-2** or **RP-2S**) (\*).

Alternatively the submission of the results of model or full-scale tests is allowed;

.2 qualitative analysis of propulsive and steering gears failures (under 12 of Part VII «Mechanical installation" of these Rules ) or analysis of the types and effects of failures (Failure Mode and Effect Analysis, FMEA) of propulsive plant elements based on building a fault tree or equivalent risks assessment method, agreed with the Register (\*);

.3 calculation of torsional vibrations, in which the long-term use of the alternative propulsion installation shall be considered separately (\*);

.4 programs of mooring and sea trials (possibly with the inclusion into the programs in accordance with 4.3);

.14 technical analysis of the ship ability to reach the port in an emergency in accordance with 2.2.6 and 2.2.7 of the Part VI «Fire Protection» of these Rules with regard to interpretations of IMO circular MSC.1 / Circ.1369 (with MSC.1 / Circ.1369 / Add. 1) (for passenger ships of 120 m or more or having three or more main vertical zones (\*);

.15 for ship with dual fuel engines (with distinguishing mark **GFS** in character of classification) analysis of risks, related to the use and storage of gaseous fuels and the possible consequences of its spill by the method, approved by the Register is provided (in accordance with IACS Recommendations №146 or ISO 31000: 2009 and ISO 31010: 2010 standards or relevant standards) (\*).

The analysis should consider risks of the hull structural elements damage and failures of any equipment after the accident, associated with the use of gas fuel. The results of the risk analysis shall be included in the operational manual;

.16 drawings of typical units of hull structures, installation of hull support parts, earthing of ship equipment (it is allowed not to submit if units are given in the drawings of hull structures and installation of equipment and support);

.17 grounding of the conditions for anchorage of a berth-connected ship (refer to 1.3.7) (\*);

.18 additional documentation for anchor handling ships:

.18.1 drawings of the location of equipment for handling anchors: winches, anchor chain stoppers, towing bits, stern rollers, lifting equipment (if any), including the typical location of cargo on deck (anchors, cables, chains, etc.) with an indication of the trajectory of the towing line, limit sectors, maximum design bollard pull, maximum design load for each component (\*\*);

.18.2 for the winch for anchor handling:

.18.2.1 design criteria, including design loads and performance of the rope emergency release system, indicating response time and residual bollard pull after release (\*\*);

.18.2.2 strength calculation of a drum with flanges, shafts with couplings, housing and brakes (\*);

.18.2.3 assembly and general drawings.

- .18.3 for anchor chain stopper:
    - .18.3.1 design criteria, including design loads and rope emergency release characteristics under operational and idle conditions (\*\*);
    - .18.3.2 strength calculation (\*);
    - .18.3.3 assembly and general drawings.
  - .18.4 for towing bits:
    - .18.4.1 design criteria, including design loads and rope emergency release characteristics under operational and idle conditions (\*\*);
    - .18.4.2 strength calculation (\*);
    - .18.4.3 assembly and general drawings.
  - .18.5 for stern rollers:
    - .18.5.1 design criteria, including design loads (\*\*);
    - .18.5.2 strength calculation (\*);
    - .18.5.3 assembly and general drawings.
  - .18.6 drawings of reinforcements and seatings under winches, anchor chain stoppers, stern rollers and towing bits with indication of the maximum design load.
  - .18.7 electrical circuits of power supply and diagrams of control systems for towing equipment and equipment for anchor handling.
  - .18.8 drawings and technical descriptions of operator stations (user interface) of towing and anchor handling equipment control systems (for descriptions (\*)).
  - .18.9 drawings and technical description of communication devices between the anchor handling control station and the wheelhouse (for descriptions (\*)).
  - .18.10 design bollard pull evaluation(\*\*).
  - .18.11 bollard pull test procedure (\*);
- .19 for ships equipped for long-term operation at low temperatures (descriptive mark **WINTERIZATION(DAT)** may be assigned):
- .19.1 Manual on ship operation at low temperatures (Winterization Manual) (\*);
  - .19.2 equipment test programs, which in operation the ship is exposed to long-term low temperatures (possibly with inclusion in programs according to 4.3) (refer also to 4.2.13.25);
- .20 scheme/plan of assembly and installation of towing equipment and towing line bridle attachment points, towing line, etc. (as part of an emergency towing booklet (see MSC.1 / Circ.1255) for ships in accordance with SOLAS Regulation II-1/3-4).

#### 4.2.3 Hull documentation<sup>1,2</sup>:

- .1 hull members scantlings determination, as well as analysis of the overall longitudinal strength and buckling stability of members for all specified loading conditions of a ship, including the loading and carriage of bulk cargoes other than grain, and, where required by the applicable Rules, local strength calculations; for reinforced concrete hulls - for hulls made of reinforced concrete - strength calculations of reinforced concrete (steel concrete, complex, composite, of prestressed concrete) constructions, calculations of structures for the disclosure of cracks and endurance and cross-sectional anchor area; vessel and hull structures vibration calculations (excluding small craft) (\*);
  - .2 midship section plan and the typical transverse sections with indication of spacing between the main longitudinal and transverse members, main particulars of the ship and their ratios, class notation of a ship. For ships, for which the total longitudinal strength calculation is carried out, hull section modulus for estimated cross-sections are indicated on drawings;
  - .3 constructional profile with indication of frame spacing, boundaries of the portions of a ship length, position of the watertight bulkheads, pillars, arrangement of superstructures and deckhouses.
- For hulls made of reinforced concrete the drawings reflect the connections of embedded fittings (profiles) and plates, profiles and bars in steel-concrete and complex structures, embedded parts and cutouts;
- .4 deck and platform plans with indication of design loads (including the loads induced by lift trucks, containers and mooring, towing and anchor equipment), positions and dimensions of openings, their strengthening, end structures of the side coamings;

<sup>1</sup> All constructional drawings mentioned here shall indicate the scantlings of the hull members, their material (with indication of grades according to Part XIII "Materials"), as well as typical sections and details, types and dimensions of fillet welds; for reinforced concrete hulls, classes and grades of concrete, classes of reinforcing steel are indicated.

<sup>2</sup> Documents under .1, .2, .3 and .6 shall be submitted with the first set of hull documentation.

**.5** double bottom (single bottom) plan. The plan shall contain sea chest sections with indication of pressure in the blow-down system, table of pressure heads, boundaries of watertight compartments, dimensions and position of manholes and other openings. For bulk carriers and ore carriers an allowable load on the inner bottom plating shall be indicated.

**.6** shell expansion with indication of the ship hull boundaries, positions and dimensions of openings in shell plating, and for ships strengthened for navigation in ice also the upper and lower edges of the ice belt and corresponding forward and aft draughts (with due regard to trim), arrangement of intermediate frames. Shell expansion for fiber-reinforced plastic ships shall be submitted if the outer shell plating has different thickness;

**.7** drawings of longitudinal and transverse bulkheads, including tank wash bulkheads (for tanks the heights of overflow and air pipes shall be indicated);

**.8** drawing of the after end framing and sternframe;

**.9** drawing of the fore end framing and stem and for pushers - towknee;

**.10** drawings of multi hull ships bridge connections design;

**.11** Reserved;

**.12** drawings of propeller shaft brackets and bossings as well as fixed nozzles, special constructions of high-speed crafts, air ducts and the hovercraft air cushion skirt;

**.13** drawings of seatings for the main machinery (main engine, main diesel engine) and boilers, including bottom construction; the drawings shall be provided with indication of type and model of the equipment and that the seating complies with the requirements of the supplier's conditions on the equipment or that no special requirements are placed by the supplier on the equipment;

**.14** drawings of seatings for equipment (arrangements, machinery) according to **2.11** of Part II of "Hull" of these Rules, which are supervised by the Register (are examined by the subdivision of the Register, which carries out technical supervision over construction, at the stage of delivery and installation);

**.15** drawings of engine and boiler casings, coamings, companions and other guards of openings in the ship's hull;

**.16** drawing of superstructures and deckhouses; drawings of ballast water tanks with their internal structures (for ships with **BWM (T)**, for integrated tanks can be combined with drawings of hull structures, (\*) for tanks);

**.17** drawings of bulwark;

**.18** strength calculations for seatings for mooring, anchor and towing equipment (\*);

**.19** drawings of seatings for mooring, anchor and towing equipment;

**.20** plan of weld control and table of hull welding (\*), containing the following information:

**.20.1** name and thickness of structural components to be joined;

**.20.2** shape or symbol of edge preparation;

**.20.3** brands and grades of base meta;

**.20.4** brands and grades of welding consumables;

**.20.5** method of welding and position of joint in space.

If the information indicated in **.20.1 – .20.5** is stated to the full in the drawings of a ship's hull, then submission of the table of welding is not required;

**.21** plan of testing the hull for watertightness (it is allowed to combine with the scheme according to **4.2.8.1**);

**.22** drawings of piping, ventilation ducts, cable lines, etc penetration through bulkheads, decks, double bottom, watertight floors and frame members;

**.23** specifications of protective coatings according to 6.5, Part XIII "Materials" (for sea and sea river navigation vessels);

**.24** basic parameters of the hull protection by damping from damages when mooring (for ships to be moored at sea to other ships) (\*);

**.25** subdivision scheme with a smooth hull assembly and welding technology (\*).

Description of fundamental process of the hull parts assembly afloat, developed on the basis of recognized by the Register methods of such works performance (if applicable);

.26 for fiber-reinforced plastic ships — a detailed description of the hull constructing process, containing the information on the materials, methods of forming the structural items, necessary conditions required during hull construction, as well as analysis of the structural strength both local and general (\*);

.27 program of ship propulsion vibration and local hull structures vibration measurements (excluding small craft);

.28 Loading manual (for sea going ships, except of category II less than 90 meters and deadweight not exceeding 30% of the tonnage on summer load-line, and stability and strength information (booklet) for the carriage of non-grain bulk cargoes of (for sea and sea river navigation ships refer to 1.4.9.7 Part II «Hull» of these Rules).;

*Note* . For oil tankers having length 150 m and above and bulk carriers having length 90 m and above, the scope of documentation shall take consider the provisions of the Common Structural Rules;

#### **4.2.4 Documentation on arrangements, equipment and outfit:**

.1 arrangement plans, drawings of essential assemblies and parts of closing appliances of openings in hull, superstructures, deckhouses and subdivision bulkheads, including data on coamings height and type of closing appliances;

.2 strength calculations of bow, side and stern closing appliances in a ship's hull (\*);

.3 arrangement plans of machinery and actuators of rudder and steering gear with indication of essential parts and assemblies; arrangement plans of the main parts and components of Active means of ship steering (AMSS);

.4 strength calculation of essential parts and assemblies of rudder and steering gear (\*);

.5 calculation of efficiency of rudder and steering gear and AMSS (\*);

.6 arrangement plan with essential parts and assemblies of hatchways of dry cargo holds;

.7 strength calculations of hatchways of dry cargo holds (\*);

.8 calculations of anchor, mooring towing and coupling arrangements, foil arrangement of the hydrofoil ship, wheelhouse lifting device, as well as for tugs - bollard pull diagrams and for escort tugs - preliminary calculation of the maximum holding force of the tug at an escort speed of 8 and / or 10 knots, including the calculation of the propulsive capacity of the escort tug required to provide and maintain the specified pull; (\*);

.9 arrangement plans of anchor, mooring towing and coupling arrangements, foil arrangements of the hydrofoil ship, wheelhouse lifting device, as well for the tugs – bollard pull diagrams and for escort tugs plan of general location of towing arrangement for escort operation including a towline fastening diagram and contains data on the minimum breaking load of the towline components and the strength of the corresponding structures;

.10 calculations of signal masts and rigging and sailing ship rigging (\*);

.11 drawings of signal masts and rigging and sailing ship rigging;

.12 arrangement plans of guard rails;

.13 calculations of essential parts and assemblies of guide members for containers in cargo holds (\*);

.14 arrangement plans of guide members for containers in cargo holds; arrangements plans of parts and components of units for the separation of bulk cargo;

.15 plans of arrangement and fastening of ladders with essential parts and assemblies (including accommodation and pilot ladders, and gangways);

.16 arrangement plan with essential parts and assemblies of catwalk on oil tankers;

.17 plan of escape routes (if missing on the general arrangements plans);

.18 arrangement plans with essential parts and assemblies of means of access for inspections of spaces in cargo area and other spaces on oil tankers, bulk carriers and sea and sea river navigation ships;

.19 means of access manual (for oil tankers and bulk carriers and sea and mixed navigation ships);

.20 calculation of hoisting gear of shipborne barges (\*);

.21 general view of hoisting gear of shipborne barges;

.22 list of emergency outfit indicating basic technical characteristics and location on the ship.

#### **4.2.5 Documentation on cargo handling gear:**

- .1 ship's cargo handling gear specification (as part of the ship specification according to 4.2.2.1) (\*);
- .2 general arrangement plans of the cargo handling gear with indication of principal characteristics (safe working load, operation areas, outreach, cargo lifting and lowering speed, maximum and minimum outreach, slewing speed, etc.);
- .3 general arrangement plans of cargo masts with derricks, ship's cranes, hoists, lifts and ship's elevating platforms, their attachments to ship structures and hull strengthening in way of their installation;
- .4 drawing (scheme) of derrick and crane rigging;
- .5 drawings of metal structures (cargo masts, derricks, bridges, gantries, mounts (pedestals) and columns, supporting and slewing gear of cranes, trunks, cars and ship's lift guides, platforms and guides of ship's elevating platforms, etc.) with strength and stability calculations;
- .6 technical documentation on machinery and drives:
  - assembly drawings with sections;
  - drawings of cargo shafts, gear wheels and pinions of reduction gear units as well as couplings (may be submitted together with assembly drawings);
  - basic diagrams of hydraulic units;
  - drawings of bed frames and housings together with particulars on welding (may be submitted together with assembly drawings);
  - strength calculations or calculation results of essential stress-bearing items (\*);
  - explanatory note or description with indication of principal technical characteristics (\*);
  - testing programmes for the prototype and a serial specimen of the machinery;
- .7 technical documentation on electrical equipment:
  - description of the operation principle and main performance specifications (\*);
  - specification including the list of associated items, devices and materials (\*);
  - structural assembly drawings;
  - circuit diagram of the electric drive;
  - testing programme;
- .8 drawings of components of the cargo handling gear together with strength calculations or with particulars proving their strength as equivalent to that of the standard components approved by the Register (\*);
- .9 drawings of safety devices (together with strength calculations where necessary) (\*);
- .10 drawings of securing of the cargo handling gear in the stowed for sea position;
- .11 diagrams of forces acting on stressed items of the cargo handling gear;
- .12 strength calculations or results of calculations for load-bearing structures as well as stability calculations of jib cranes and rope-suspended jib booms (\*);
- .13 instructions for derricks operating in union purchase rig with indication of the working range, safe working load, types, sizes and scheme of rigging;
- .13 testing programme of the cargo handling gear in assembly at the manufacturer.

Technical documentation on cranes, winches, metal structures, gear and safety devices of cargo handling gear may be submitted separately (independent of the ship technical documentation), the types and purposes of the ships and floating facilities for which they are designed shall be, however, indicated.

#### **4.2.6 Documentation for the equipment of ships.**

##### **4.2.6.1 Life-saving equipment and appliances documentation:**

- .1 location drawings of life boats and rescue boats, life rafts, marine evacuation systems and their launching appliances, primary and emergency lighting of their location and outboard launch area of life-saving appliances and also appliances for embarkation of people in collective life-saving appliances that are at water;
- .2 drawings of launching appliances fastening for collective life-saving equipment and rescue boats and means of embarkation into them;
- .3 drawings of collective life-saving equipment and rescue boats fastening with display of explanatory (manual) plaque or signs;
- .4 arrangement plans of muster stations and embarkation into collective life-saving equipment stations and lighting, communication and wave protection and protection against ingress of water in collective lifesaving equipment facilities;



.5 drawings of location and stowing of individual life-saving appliances of mapping with display of their packaging;

.6 necessary calculations and data confirming the Register Rules carry out (\*).

#### **4.2.6.2 Signal means documentation:**

.1 drawings of location, mounting and grounding of signal-distinctive and signal-flashing lamps and also pyrotechnics and sound signal means indicating the main coordinates of their location and the name, type, technical characteristics and number of signaling means;

.2 a list of signal means indicating their main technical characteristics and the number of signaling means (\*).

#### **4.2.6.3 Navigating Bridge documentation:**

.1 drawings of navigating bridge (for sea-going ships and ships of sea-river navigation) showing:

.1.1 bridge arrangement, including the configuration and location of all working places on the bridge, including working places to perform additional functions of the bridge with displaying aisle width sieling height, the height of openings and doors, the distance between the deck plating and the bottom edge of equipment attached to the cieling, and installed separately from the equipment power supplies, heating, ventilation, communication, alarm and lighting devices;

.1.2 configuration and dimensions of working panels;

.1.3 arm-chairs installed for use in the workplaces, specifying the minimum and maximum altitude of regulation and horizontal distances of their movement;

.2 equipment arrangement plan (not less than in two projections).

The drawings shall display the location of radio navigation and other equipment at workplace panels and elsewhere on the navigating bridge and beyond, functionally associated with the bridge, wherein the following should be indicated (if available):

.2.1 distress signal system control panels (integrated or remote);

.2.2 VHF radio installations;

.2.3 MF or MF/HF radio installation, including the letter printing device;

.2.4 satellite radiocommunication means, including printing device;

.2.5 receivers providing continuous monitoring of the DSC notification on channel 70 (VHF), frequency 2187.5 kHz, DSC frequencies in the HF band;

.2.6 NAVTEX and extended group call (EGC) receivers;

.2.7 means for identification of ship's and life-saving appliance position for the purposes of search and rescue, radar transponder (RT) of the ship and life-saving appliance automatic identification system transmitter (AIS) of the ship and life-saving appliance (RT-AIS), emergency position identifying radar beacon;

.2.8 VHF radio installations of two-way radio communication and chargers;

.2.9 VHF radio installations of two-way radio communication with planes and chargers (for passanger ships);

.2.10 Emergency lighting lamp that receives power from the backup source of electricity (GMDSS batteries);

.2.11 charger for backup electric power source (GMDSS batteries);

.2.12 ship security alert system and security alert button for transmitting and receiving (confirming) alert signal;

.2.13 power switchboards for radio and navigation equipment (with protection devices);

.2.14 optical magnetic compass or repeater performance transmission device;

.2.15 GNSS transceiver indicator;

.2.16 external sound signals receiving system (ESSRS) (for vessels with enclosed navigating bridge);

.2.17 log and its repeaters;

.2.18 echo-sounder and its repeaters;

.2.19 gyrocompass: pelorus / repeater (for course readings, for direction finding (gyroazimuth));

- .2.20 rate of turn indicator and its repeaters;
- .2.21 AIS equipment;
- .2.22 manual steering control, steering mode switch, ship course/track control system;
- .2.23 radars;
- .2.24 electronic chart display and information system (ECDIS);
- .2.25 long range identification and tracking system (LRIT);
- .2.26 bridge navigation watch alarm system (BNWAS);
- .2.27 rotation speed, force and direction of propeller thrust; pitch and operational mode of controllable pitch propellers; rudder angular position; force and direction of thruster indicators;
- .2.28 remote video surveillance equipment;
- .2.29 voyage data recorder (VDR);
- .2.30 whistle/typhon control;
- .2.31 main alarm switchboard (devices and indicators emergency alarm system affecting safety of navigation);
- .2.32 internal ship communications (equipment for automatic telephone communication, internal radio communications and command microphone station of command-translational unit);
- .2.33 propulsion gear control;
- .2.34 thruster control;
- .2.34 engine alarm switchboard;
- .2.36 fire alarm panel of fire detection and aerosol fire-extinguishing system actuation;
- .2.37 ventilation emergency shut down;
- .2.38 cargo alarm panel;
- .2.39 alarm switchboard/display;
- .2.40 windows wiping and heating control system; binoculars; signal flags;
- .2.41 lighting control buttons;
- .2.42 navigation lights turn on indicators and signal lights off alarm (switch);
- .2.43 automation equipment on the bridge, refer to 4.2.14.12;
- .3 drawings of visibility areas from navigating bridge (for seagoing ships and sea river navigation vessels with a maximum length of 55 m or more), including:
  - .3.1 Sea surface areas of visibility from the places of vessel control for the said vessels;
  - .3.2 areas of visibility in the horizontal plane from the vessel control place, including individual shady sectors and the amount of shadow sectors towards the bow of the ship along the arc of the horizon 180° (from beam to beam);
  - .3.3 area of visibility in the vertical plane towards the stern of the vessel up to 10° to each side under different draft, trim and location of deck cargo conditions, from the place of vessel control and workplace for navigation and maneuvering, including the line of sight along the top edge of the window from a standing position and the lower edge of the window from a seated position;
  - .3.4 visibility of ship's side from the navigating bridge wing;
  - .3.5 location of windows, including slope, size, space between the windows and the height of the upper and lower edges above the bridge deck, and the height of ceiling;
- .4 list of all equipment installed on the bridge (\*) with the name and type.

For self-propelled sea-going ship and ship of sea river navigation project documentation associated with the navigating bridge construction, its equipping with radio equipment and navigation systems and other ship equipment should be developed taking into account the Chapter V/15 of the International Convention of Safety of Life at Sea, 1974 (SOLAS 74) as modified by the Protocols 1978 and 1988 there to with further amendments (SOLAS 74/78/88).

For self-propelled sea and mixed sea-river navigation vessel with distinguishing mark **NAV-1** design documentation shall be made taking into account the requirements of **1.3.7** and configuration of equipment in accordance with Chapter V of the International Convention of Safety of Life at Sea, 1974 (SOLAS 74) as modified by the Protocols 1978 and 1988 there to with further amendments (SOLAS 74/78/88)

#### **4.2.6.4 Radio equipment documentation:**

**.1** electrical connections circuit of all radio equipment blocks (according to the type-approval certificate). Wherein the following should be reflected (if applicable):

**.1.1** antennas switching circuit;

**.1.2** power supply circuit from the main, emergency and backup sources of electricity (GMDSS batteries);

**.1.3** protection and disconnect devices as well as protection from radio interference;

**.1.4** connection of chargers;

**.1.5** connection of receiver-indicator GNSS (GPS/GLONASS/Galileo) to the VHF/MF/HF - radio installations;

**.1.6** type (brand) and section of cables cores;

**.2** block diagram (scheme of electrical connections of all blocks) of command translational device to display the main locations and remote command microphone stations;

**.3** drawing of antennas location (in three projections). Wherein the following should be reflected (if available):

**.3.1** all transmitting aerials including coordinating device;

**.3.2** all receiving antennas;

**.3.3** aerials of satellite communication equipment;

**.3.4** location free float satellite EPIRB;

**.3.5** location of external sound signals receiving system microphones;

**.4** calculation of the reserve source (batteries) of electrical energy capacity for GMDSS radio equipment supply (\*);

**.5** calculation of VHF and HF radio systems range (\*).

#### **4.2.6.5 Navigation equipment documentation:**

**.1** electrical connections circuit of all electro navigation equipment blocks (according to the type-approval certificate). Wherein the following should be reflected (if applicable):

**.1.1** aerials switching circuit;

**.1.2** power supply circuit from the main, emergency and backup sources of electricity

**.1.3** protection and disconnect devices as well as protection from radio interference;

**.1.4** connection of GNSS receiver-indicator (GPS/GLONASS/Galileo) to the VHF/MF/HF - radio installations;

**.1.5** connection of gyrocompass/long range course transmission unit with other equipment;

**.1.6** connection to voyage data recorder (VDR);

**.1.7** type (brand) and section of cables cores;

**.2** drawing of aerials location (in three projections). Wherein the following should be reflected (if available):

**.2.1** all signal transmitting and receiving antennas;

**.2.2** Radar antennas (indicating the rotation radius of the aerial and any cargo or ship structures (masts, booms, containers, etc.) that can interfere with radio waves or degrade radar performance);

**.2.3** of GNSS receiver-indicator antennas;

**.2.4** location of main / auxiliary magnetic compass;

**.2.5** location of voyage data recorder special protective container (capsule);

.3 list of information (data) that is recorded by voyage data recorder, indicating the format and the data source (equipment, sensors) (if applicable) (\*).

**4.2.7 Documentation on stability and manoeuvrability** (\*), (except for the documents below):

.1 lines drawing, coordinate tables of lines;

.2 hydrostatic curves;

.3 curves of areas and static moments of hull cross sections;

.4 calculations and curves of arms of form stability (cross-curves) including drawing of the buoyant hull;

.5 summary table of displacements, positions of centre of gravity, trim and initial stability for various loading conditions;

.6 calculations relating to verification of a ship's stability according to these Rules; mass tables for various loading conditions with indication of distribution of cargoes, fuel oil, fresh water and liquid ballast in tanks; calculations of roll amplitude and weather criterion; diagrams of windage area of a ship and calculations of heeling moments; calculations of heel caused by crowding of passengers and by turning; calculations of icing, angles of flooding, corrections for free surface effect of liquid cargoes and stores, etc.; deck cargo arrangement plan;

.7 summary table of the results of stability verification according to these Rules and curves of static or dynamic stability, required by the Rules for different load cases (it is allowed to include a summary table in the Stability Information); for escort tugs - calculations (preliminary) of tug stability in escort mode;

.8 stability calculations for the case of loading and stowage of bulk cargoes other than grain (for ships carrying such cargo);

.9 additional technical documentation for ships, engaged in carriage of grain in bulk:

.9.1 calculation and curves of cargo spaces volumes and center of gravity positions depending on the space filling level;

.9.2 calculation and heeling moments curves through shift of grain (if equipment that limits the shift is available, and without it) depending on the filling of compartment for joint and separate loading of cargo spaces;

.9.3 diagram or vessel's stability control table on heeling moments limit value and calculations, which the table is based on (may be submitted with the approval of information about the vessel's stability when loading grain);

.9.4 estimated materials on the typical grain loading plan (stowage of supply, ballast and cargo, the calculation of load, stability test calculations, calculations, which are the grounding for recommendations on ballasting, etc.). Calculations are made for the ship at the beginning and end of the voyage and, where necessary, for the most unfavorable intermediate state;

.9.5 drawings of equipment for carriage of grain, if it is installed, along with calculations of strength (stamp of approval);

.9.6 ship strength test calculations for the case of uneven load along the length of the ship;

.10 program of model tests and experimental studies of stability in the transitional and operational modes of hydrofoils navigation;

.11 calculations and experimental program, if necessary modeling, research and stability tests in driving mode of the hovercraft;

.12 program of field maneuver trials under the Guidelines on determining the maneuvering characteristics of the vessel (for vessels of 100 meters or more in length and chemical carriers and gas carriers built on 01.01.2004 and after that date, except high speed crafts, and according to the requirements of the Rules on maneuvering characteristics and for other vessels (stamp of approval);

**.13 Reserved;**

.14 solid ballast stowage scheme (if ballast is available) (stamp of approval);

.15 stability information (preliminary) (stamp of approval) and estimated materials if these materials are not included in the documentation submitted under 4.2.7.1-4.2.7.9 or require correction based on the results of heeling test (\*) concerning estimated materials. For sea-going ships it is allowed to introduce stability information as into Damage trim and stability or Information on the effects of compartment flooding according to 4.2.8.8 For final approval of Stability information and Stability and floodability information, if required, Ship heeling test protocol and corrected, if necessary, information taking into account the results of the above test is provided;

.16 ship stability information when loading grain (for ships, engaged in carriage of grain in bulk) (stamp of approval). For approval of Ship stability information when loading grain, except documentation specified in 4.2.7.9, the protocol of ship heeling test, taking into account the results of which the information is compiled, must provide;

.17 information about the place of refuge (for ships with distinguishing marks of navigation area restriction: **R3-S, R3-RS, B-R3-S, B-R3-RS, C-R3-S, C-R3-RS, D-R3-S, D-R3-RS, R3, R3-IN, B-R4-RS, R4-RS**).

#### 4.2.8 Documentation on subdivision (\*), (except for the documents below):

.1 plan of subdivision showing all watertight structures and openings with indication of types of closing appliances, as well as arrangements used for equalizing heel and trim of a damaged ship;

.2 calculations on probability estimation of subdivision (if required);

.3 calculations of damage trim and stability, including static stability curves;

.4 cross-curves of stability (for a damaged ship) if necessary for the adopted method of damage stability calculation;

.5 calculations of sectional areas of cross-flooding fittings and of uprighting time of a ship;

.6 corner point coordinate table for compartments and tanks;

.7 documentation on installation of flooding detection sensors of water ingress into compartments of passenger ship and bulk carrier or a cargo ship with one hold and a length of less than 100 m, as specified in Part V "Subdivision". The documentation, as a minimum, shall include:

flooding detection system specification;

flooding detection system Type Approval Certificate;

single-line diagrams of the flooding detection system (stamp of approval);

documents with indication of the location of the flooding detection system equipment (stamp of approval);

description of the procedures necessary for the performance in case of failures in the emergency alarm system;

requirements on technical maintenance of emergency alarm system equipment;

Flooding detection system operational Manual (stamp of approval).

.8 Damage stability and stability information (preliminary) (stamp of approval), see also 4.2.7.15, and calculated materials on the basis of which it is composed, according to 4.2.8.3, if these materials accompanying the Information or require corrections (\*) concerning calculated materials). Damage stability and stability information, if necessary, is corrected, taking into account initial stability clarification upon the results of heeling test and, if necessary, ship trials.

Information on compartment flooding effect (for sea dry cargo ships with length  $L_1 < 80$  m (refer to 1.4.9 Part V «Subdivision" of these Rules (instead of Damage trim and stability information);

.9 Damage control scheme and plan((for sea-going and sea river navigation ships) (stamp of approval).

#### 4.2.9 Freeboard assigning documentation:

.1 Freeboard calculation (\*) and the drawing of load line;

.2 Reserved;

.3 drawings of the general location of openings and closings that provide watertightness of outer restrictive construction of the vessel (outer doors, cargo hatches, service hatches, bow, side and stern doors and apparel; skylights and windows, storm scuppers and porticos, sea connections of seawater, sewage, plumbing, etc.; air pipes and vent heads, ventilation ducts covers, machinery spaces skylights and so on (can be used drawing according to 4.2.4.1 with completing it with the necessary information (drawings) (\*);

.4 terms of freeboard assignment (\*);

.5 drawings of stowage and fastening timber deck cargo (if carried and timber freeboard assignment);

.6 data on the safety of crew and passengers (bulwarks, railing, bridges and transitional passages, etc. (refer to 4.2.9.4) (\*);

.7 Damaged stability and stability calculation of vessel with flooded compartments (for sea and sea river sea navigation ships with reduced freeboard) (\*).

The following documentation is used or submitted for determining the freeboard:

theoretical drawings (according to 4.2.7.1);

general arrangement drawings (according to **4.2.2.2**);  
determination of hull structures members (according to (по **4.2.3.1**);  
strength calculation of dry of cargo ships cargo hatches covers (according to **4.2.4.7**);  
stability information (according to **4.2.7.15** after correction, if necessary);  
loading instructions (if required by applicable Rules) (according to **4.2.3.28**).

#### **4.2.10 Documentation on fire protection:**

**.1** documents on structural fire protection;

**.1.1** arrangement plan of fire-protective divisions, including doors and penetrations (cutouts) in these structures with indication of categories of these spaces in accordance with:

for sea-going ships - **2.2.1.3, 2.2.1.5, 2.3.3** or **2.4.2** Part VI "Fire Protection" of these Rules;

and also the number of certificates for the door and aisle seats design type approval, (cuts);

**.1.2** schemes or description of insulation, lining, finishing, deck covering and other finishing indicating the numbers of certificates of material type approval issued under the Code on fire test procedures (refer to :

**1.6** and **2.1.1.5 - 2.1.1.9** of Part VI "Fire protection" of these Rules)

**.1.3** calculations (\*) as required:

in **2.1.1.4** and **2.1.1.10** of Part VI «Fire protection» of these Rules;

**.2** diagrams of fire extinguishing systems and smoke detection system by air sampling with associated description, calculations and other data, which confirm the fulfilment of the requirements of Parts "Fire Protection" of these Rules (\*) concerning calculations).

The documentation shall contain data on the dimensions of pipes (diameter and wall thickness), the design of piping (materials, insulation, manufacturing technology, installation, location, hydraulic tests, etc.), as well as data on the materials of applicable piping, gasket materials and types of pipe connections;

**.3** diagram and drawing location of LNG domestic system (if available);

**.4** list of fire-fighting outfit (\*).

**.5** structural drawings of units and parts of fire protection structures showing documents on conducting fire tests required;

**.6** structural drawings of insulation, lining and deck covering;

**.7** arrangement plan of fire-fighting outfit and emergency breathing devices;

**.8** list of spare parts and tools (\*);

**.9** preliminary fire plan (\*) according to 1.4 of Part VI «Fire protection» of these Rules (stamp of approval is placed on completion of ship construction).

**.10** calculations of thermal emission from the flame, which can occur during a fire affecting the fuel tank with gas, and other equipment and spaces associated with gas fuel (\*) (for ships with dual-fuel engine (with distinguishing mark **GFS** in the character of classification)).

**.11** electrochemical protection scheme in oil tankers.

#### **4.2.11 Documentation on machinery and boiler plant:**

**.1** general arrangement plans of machinery and equipment in the machinery spaces of category A, as well as in the emergency diesel generator spaces (refer to **1.2**, Part VII "Machinery Installations") and in the of emergency diesel generators rooms with an indication of attachment points to the corresponding structures of the ship, walkways and f escape routes;

**.2** drawings of seatings and attachment fittings of the main machinery, boilers and shaft bearings;

**.3** diagram (\*) and description of the remote control for the main machinery completed with information on equipment of remote control stations fitted with controls, indicating instruments and alarm devices, means of communication and other devices.

*Note.* When remote control for the main machinery is supplied as complete delivery with the main engines and/or with steerable propellers, the mentioned diagram and description may be submitted together with the documentation required by Rules for Technical Supervision during Construction of Ships and Manufacture of Materials and Products for Ships;

.4 drawings of arrangement and outfitting in fuel oil and lubricating oil tanks;

.5 arrangement plan of fuel tanks indicating the distance from the side plating and bottom to the tanks; drawing of supports and other structures that provide mounting and restrict movement of fuel tanks (for vessels with bi-fuel engine (with distinguishing mark **GFS** in the character of classification)).

*Note.* 1. Regarding LNG fuel tanks (tanks for storing liquefied gas fuel) technical documentation to the extent required for the approval of cargo tanks for the transport of LNG gas carriers in accordance with the Rules for classification and construction of vessels for the transportation of Liquefied Gases in Bulk and the International Code of construction and equipment of ships carrying liquefied gases in bulk must be submitted.

2. With respect to CNG fuel tanks (compressed gaseous fuels storage tank) technical documentation to the extent required for the approval of cargo capacity for CPG carriage by gas carriers in accordance with the Rules for classification and construction of vessels for the transportation of compressed natural gas must be submitted. If the standard cylinders are used, then the calculation of allowable pressure is provided;

.6 documentation on shafting:

.6.1 general view of shafting;

.6.2 drawing of sterntube and parts of sterntube arrangement, drawing of casing protecting the area between the sterntube and propeller boss;

.6.3 sterntube bearing and sterntube seal lubrication and cooling diagrams;

.6.4 drawings of shafts (propeller, intermediate and thrust);

.6.5 drawings of shaft connections and couplings;

.6.6 drawings of journal and thrust bearings of shafting and their fastening to the seatings;

.6.7 strength calculation of shafts and their fastening parts (\*);

.6.8 calculation of the number of shaft supports, their position and loads carried (\*);

.6.9 calculation of parameters of shafting alignment (\*);

.6.10 calculation of fitting of propeller and shafting couplings (\*);

.6.11 1 torsional vibration calculations in compliance with the requirements of Section 8, Part VII "Machinery Installations" for for sea-going and sea river navigation ships (\*). In some cases axial and bending fluctuations calculation may be required (in accordance with the requirements of Section 5 of Part VII « Machinery installation" of these Rules).

.7 calculation of power of the main machinery for **Ice2-Ice6** and Baltic ice class **IA Super, IA, IB i IC** ships in compliance with the requirements of 2.1 and 2.9.1 of Part VII "Machinery Installations" accordingly to the minimum value of power delivered to the propeller shafts of the ships (for sea-going and sea river navigation ships) (\*);

.8 documentation on propeller and other screw (for screws that are not covered by the Rules for documentation is set in consultation with the Register in each case):

.8.1 general view of propeller;

.8.2 strength calculation of propeller blade, and for detachable-blade propellers and controllable-pitch propellers (CP-propellers), also calculation of fastening of blades to the boss (\*).

*Note.* The documentation may be submitted together with the documentation required by Section 7, Part IV "Technical Supervision during Manufacture of Products" of the Rules for Technical Supervision during Construction of Ships and Manufacture of Materials and Products for Ships;

.8.3 drawings of blade, boss and cone, as well as items for their securing (for detachable-blade propeller and CP-propeller);

.8.4 drawing of propeller attachment to propeller shaft;

.8.5 description of pitch actuating mechanism (PAM) and its control system (\*);

.8.6 diagrams of pitch actuating mechanism (PAM);

.8.7 pitch control unit (PCU) as assembled (\*);

.8.8 drawings of the main parts of the pitch control unit, including shaft of the pitch control unit, hydraulic cylinders, push-pull rods, pistons, slides, oil distribution boxes, lubricating oil supply tube to hydraulic cylinder in hub.

.9 calculations of propeller (or impeller of water-jet), shafts, couplings, pinions, gear wheels of steerable propellers, water-jets and thrusters, paddle wheel, fan screw to create an air cushion and their calculations (according to calculations (\*));

.10 documentation on active means of the ship's steering (AMSS):

.10.1 drawings of AMSS installation and securing;

.10.2 data to confirm compliance of the AMSS construction with operational conditions (\*);

.10.3 general view with necessary sections and sealing details;

.10.4 calculations of propeller (or impeller of water-jet), shafts, couplings, pinions, gear wheels of steerable propellers, water-jets and thrusters (when CP-propeller is used, refer to 4.2.11.8) (\*);

.10.5 drawings of propeller (or impeller of water-jet), shafts, couplings, pinions, gear wheels of steerable propellers, water-jets and thrusters (when CP-propeller is used, refer to 4.2.11.8);

.10.6 strength calculations of the input drive shaft of rotor, blade, gearing of vertical-axis propellers (\*);

.10.7 drawings of shafts, gearing, rotors, blades and pitch control gear of vertical-axis propellers;

.10.8 drawings of bearings and seals;

.10.9 9 calculation of connections, drawings of propeller nozzles and tunnels, including information on acceptable clearance between ready-fitted propeller and tunnel (nozzle) (\*);

.10.10 hull member drawings and drawings of reversible-steering gear of water-jets;

.10.11 diagrams of cooling, lubricating and hydraulic turning systems for steerable propellers (blades of CP-propellers), as well as particulars of piping of the above mentioned systems;

.10.12 calculations of electric drives for electrically driven AMSS (\*);

.10.13 diagrams of electric drives for electrically driven AMSS;

.10.14 documentation on monitoring, control, and protection systems;

.10.15 torsional vibration calculations (for main AMSS and dynamic positioning systems) and service life calculation of rolling bearings (\*);

Moreover, the Register may require presentation of rotational and calculations of pendular vibration for steerable propellers if used as main AMSS (\*);

.10.16 AMSS specification, containing its principal characteristics, as well as material specifications for principal parts and assemblies (\*);

.10.17 prototype and pilot specimen test programme;

.10.18 description, service and maintenance manual (\*).

.11 steering column (outboard motors) remote control scheme;

.12 Reserved;

.13 list of spare parts;

.14 documentation on refrigerating plants (refer to 5.3).

*Note.* The documentation listed in 4.2.11.6, 4.2.11.8-4.2.11.10 shall contain information on treatment and geometry of working surfaces, heat treatment, tolerances on mating parts, hydraulic tests, non-destructive testing, etc.

#### **4.2.12 Documentation on systems and piping:**

.1 documentation on ship's systems:

.1.1 bilge system diagram;

.1.2 ballast system diagram; for **BWM (T)** ships, the ballast system diagram shall include additional ballast water management system equipment for ballast water treatment;

.1.2.1 Ballast Water Management Plan (for sea and sea-river navigation ship equipped with ballast system, it is approved by the Register, taking into account, if available, the corresponding authorization from the Flag Administration, that may be submitted for examination at the stage of ship construction)

.1.3 heel and trim system diagrams, as well as diagrams of devices (automatic and manually controlled) for ship equalization by cross-flooding;



**.1.4** air, overflow and sounding pipes diagrams, installations of liquids level indicators, remote level measurement in fuel tanks, cargo and drain tank of oil tankers;

**.1.5** diagrams of ventilation and air conditioning systems of accommodation, service, cargo, machinery and production spaces with indication of watertight and fire-resisting bulkheads, arrangement of fire dampers, as well as indication of closures of ventilation ducts and openings;

**.1.6** diagrams of sanitary and drain water systems, as well as scuppers with indication of watertight bulkheads, freeboard deck and distances from waterline or freeboard deck to the relevant discharges;

**.1.7** diagrams of sea chest heating and blow-down systems, heating system of side valves, heating system for liquids in tanks, steaming system for tanks;

**.1.8** diagram of the compressed air system for typhoons, for purging the sea chests;

**.1.9** diagrams of systems for hydraulic drives of mechanisms and arrangements;

**.1.10** diagrams of special systems for oil tankers and combination carriers;

**.1.11** diagram of thermal liquid system;

**.1.12** 1 calculations of the systems: bilge, ballast, vapour emission control; ventilation of battery rooms, cargo pump rooms, machinery of category A and ADG, hangars for helicopters, enclosed spaces and holds intended for the carriage of motor vehicles and dangerous goods, and others, for which the Rules require to ensure the regulated exchange of air (\*);

*Note.* For dual fuel ship (with distinguishing mark **GFS** in the character of classification) documentation in accordance with **4.2.12.1.1**, **4.2.12.1.2**, **4.2.12.1.5** i **4.2.12.1.12** shall display:

**.1** diagrams and calculations of ballast and drainage systems in gas dangerous spaces;

**.2** diagrams and calculation of ventilation in gas dangerous spaces;

**.3** diagrams and calculation of the vapor system.

**.2** documentation on machinery installation systems:

**.2.1** diagrams of live and waste steam systems;

**.2.2** diagrams of purging systems for boilers, machinery and steam piping;

**.2.3** diagram of condensate and feed water system;

**.2.4** diagram of fuel oil system and ship helicopters fueling system, with a flashpoint below 43° C.

For dual fuel ship (with distinguishing mark **GFS** in the character of classification):

**.2.4.1** drawings and diagrams of systems and piping for gaseous fuels showing these units as expansion joints, flange connections, valves and control valves, drawings of fuel gas system quick-closing devices, schemes of systems of gas fuel preparation, heating and pressure control, pipelines, containing gas fuel at a temperature below minus 110 ° C, stress calculations;

**.2.4.2** drawing of safety and vacuum valves of gaseous fuels storage tanks (GFST);

**.2.4.3** drawings and description (concerning description (\*)) of all systems and devices to measure the quantity and characteristics of the fuel and gas leak detection;

**.2.4.4** diagram of control and regulation of temperature and pressure of gaseous fuel;

**.2.4.5** data on the properties of gas fuel, intended for use on the vessel;

**.2.5** diagram of lubricating oil system;

**.2.6** diagrams of fresh water and sea water cooling systems;

**.2.7** diagram of starting air system;

**.2.8** diagram of exhaust gas pipes and uptakes;

**.2.9** drawing of sea chests and ice boxes equipment;

**.2.10** calculation of starting air system (\*);

**.2.11** calculation of fuel oil service tank capacity of emergency diesel-generator (\*);

**.2.12** drawings of silencers and spark arresters of exhaust gas pipes and uptakes (\*);

**.2.13** drawings of position and details of attachment of bottom and side valves and valves at the collision bulkhead;

**.2.14** drawings of air pipes and ventilator pipes on open deck spaces;

**.2.15** drawings of pipelines and ventilation ducts passing through the watertight bulkheads, fire-fighting divisions, decks and platforms;

**.3** data on pipe dimensions (diameter and wall thickness), on piping construction (materials, insulation, manufacturing methods, installation, arrangement, hydraulic tests, etc.) as well as data on material of pipes used, material of gaskets and types of pipe connections shall be contained in documentation listed in **4.2.12.1** and **4.2.12.2**.

#### **4.2.13 Documentation on electrical equipment:**

##### **4.2.13.1** General documentation

**.1** diagrams of power generation and distribution from the main and emergency sources of electrical power: power networks, lighting networks (up to section distribution switchboards) and navigation lights;

**.2** single-line diagrams and general view of the main and emergency switchboards, control desks and other switchboards of non-standard design;

**.3** calculation results of necessary output of the ship's electric power plant, including accumulator (solar) batteries as the main source of power for small craft, for the operating conditions, substantiation of the choice of the number and power output of generators, as well as calculation of capacity of emergency sources of electrical power (\*);

**.4** detailed diagrams of the main current, excitation, control, pilot, signalling, protection and interlocking of the electric propulsion plant;

**.5** calculation results of necessary power output of the propulsion generators to ensure normal operation under all operating conditions (\*);

**.6** results of short-circuit current calculations and analysis of selective properties of protective devices for rated current of the generators or the generators operating in parallel in excess of 1000 A (\*);

**.7** calculation results of illumination intensity for areas and spaces (\*);

**.8** diagrams of external connections of the ship control devices, electric machinery telegraph; telephone service; an emergency alarm, fire detection alarm; volumetric fire-extinguishing system starting alarm; watertight and fire doors closure alarm; machinery spaces alarm; machinery watch alarm system; water ingress alarm in the cargo holds of bulk cargo ships, passenger ships having on board 36 and more persons, cargo ships with one holds, which are non-bulk vessels; stationary fire extinguishing system local unit starting alarm.

For dual fuel ship (with distinguishing mark **GFS** in the character of classification) diagrams of electrical systems of measurement and alarm equipment associated with the use of gaseous fuels;

**.9** documentation on fixed electrical measuring instruments and alarm systems for ultimate concentration of dangerously explosive and noxious gases (\*);

**.10** protective earthing diagrams, drawings and, where necessary, calculations lightning arrester appliances for oil tankers, gas carriers, rigs and vessels with non-metallic hulls (concerning calculations (\*));

**.11** arrangement diagram of cable runs with indication of spaces which they pierce, including information on power supply cables for services required for operation under fire conditions in case of their transit routing through high fire risk spaces (refer to **16.8.1.9** and **16.8.1.11**, Part XI "Electrical Equipment");

**.12** capacity calculation results for accumulator batteries of emergency lighting, navigation lights, general alarm system, fire alarm system and fire smothering appliances, starting arrangements of the emergency diesel generators (\*);

**.13** results of calculation of the expected total harmonic distortions for different parts of the ships mains when using power semiconductor units, as well as harmonic distortion calculation results following the harmonic filters failure during their installation in the ship's electrical distribution system (\*);

**.14** list of electrical equipment installed in dangerous zones, containing information on spaces and areas where it is installed with indication of zones and spaces and information on this equipment with indication of type of explosion protection (\*);

**.15** calculation of expected efficiency of overload protection of generator sets by means of disconnection of the part of consumers with explanations of the number of disconnection steps and the list of disconnected consumers in every step (\*);

**.16** diagram and drawing of disconnection and blocking system of electrical equipment, which is not used in *2024 edition*

the oil recovery ship operations on elimination of oil spills;

.17 instructions on preparation and application of electrical equipment of oil recovery ship for elimination of oil spills. It is to determine the procedure of compulsory disconnection of power consumers having no Certificates on Safe Type Electrical Equipment (\*);

.18 arrangement plan of equipment and cabling in hazardous areas and spaces. Documentation (Certificates of competent authorities), which confirms the possibility of using explosion-proof electrical equipment in hazardous areas and spaces;

.19 calculation of voltage drop when a consumer with the maximum starting power is switched on (\*);

.20 list of measures to ensure the electromagnetic compatibility of a ship equipment (\*);

.21 electrical connections diagrams indicating the types of cables and schemes of all elements installation; circuits of electrical signal-distinctive and flashing lights and electrical sound signal means connections, for ships equipped for long-term operation at low temperatures (with distinguishing mark **WINTERIZATION(DAT)**), electrical connection diagrams of electrical heating systems (electrical heaters, systems using heating cables);

.22 drawings of cable runs and their penetrations through watertight, gastight and fire-fighting divisions with indication of measures taken to suppress radio interferences.

For dual fuel ship (with distinguishing mark **GFS** in the character of classification) – drawings of cable laying in explosive and gas-hazardous spaces;

.23 diagrams of the main and emergency lighting in the spaces and places of arrangement of essential appliances, escape routes, survival craft embarkation stations on the deck and outboard (supplying from distribution switchboards);

.24 drawings of layout and installation of essential electrical equipment and electric propulsion installation.

For dual fuel ship (with distinguishing mark **GFS** in the character of classification):

.24.1 technical justification of the electrical equipment compliance(\*);

.24.2 layout drawings of electrical equipment associated with the use of gas fuels;

.25 diagrams and installation and layout drawings of electrical apparatus and facilities for measuring non-electric values (level, pressure, temperature gauges, etc.);

.26 technical background containing substantiation of distinguishing mark **EPP** (if applicable) in the class notation (\*);

.27 For dual fuel ship (with distinguishing mark **GFS** in the character of classification)– drawing of electrical equipment, cables, piping, installed in gas dangerous spaces grounding;

.28 where the classification of the refrigeration plants is provided, the documentation stated in 4.2.13.1 and 4.2.13.2 shall take into account available electrical equipment of the refrigeration plant.

**4.2.13.2** Documentation on individual types of electric equipment:

.1 diagrams of electric connections (for systems and equipment specified in 4.2.13.1.1, 4.2.13.1.2, 4.2.13.1.4, 4.2.13.1.8, 5.3.1.10) with indication of cable types and places of installation of all elements of the diagrams (\*);

.2 diagrams of essential electric drives of the equipment for critical application and electrical protection systems, remote controls and alarm systems.

For dual fuel ship (with distinguishing mark **GFS** in the character of classification) diagrams of electric drives and control systems of fuel preparation systems, ventilation and air explosive premises gateways; diagrams of essential electric drives (according to 1.3.2.1 and 1.3.2.2 of Part XI "Electrical Equipment") with indication of cable types and places of installation of all elements of the diagrams (\*);

.3 diagrams of lubrication systems for electrical machines and air cooling systems for the main electrical machines (\*);

.4 documents on portable electrical measuring instruments and alarm systems for ultimate concentration of dangerously explosive and noxious gases (\*);

.5 failure mode and effects analysis (FMEA) for all electric and hydraulic components of the podded azimuth thrusters used as the rudder and steering gear (\*\*);

.6 assembly drawings of the main and emergency switchboards, electric propulsion plant switchboards,

control stations and panels, special switchboards, power and lighting switchboards (\*);

.7 calculation results of cross-sections of cables with indication of their types, currents and protection (\*\*).

*Note* . Technical documentation listed in 3.2.10.2 shall be submitted by the designer or alternative organization (contracted manufacturer, supplier, shipyard or system integrator). In the latter case, the documentation shall be developed taking into account the solutions adopted in technical documentation listed in 3.2.10.1, and shall be submitted for approval at the stage of delivery and installation to the Register for supervision during construction, together with the documentation according to 1.4.2 of Part XI "Electrical Equipment" of these Rules, approved under technical supervision of electrical equipment.

#### 4.2.14 Documentation on automation equipment.

##### 4.2.14.1 General documentation:

.1 list and technical description of automation systems and devices with indication of their purpose, principle of operation, their functions, configuration, self-diagnosis principles, with mandatorily designated system integrator (shipyard or, by cooperation, contracted alternative organization/supplier) for each system as well as consoles and control switchboards in the main machinery control room and on the navigation bridge (\*);

.2 list of controlled parameters with indication of unique identifier, parameter description, type of signal (i.e. analogue/digital, input/output, etc.), distribution by automation systems and devices depending on the signal intended functional purpose (control, alarms, protection, indication), distribution by automation equipment groups;

.3 general arrangement plans of automation equipment in the main machinery control room and on the navigation bridge;

.4 technical background containing substantiation of distinguishing automation mark for ships having distinguishing automation mark in the class notation (\*);

.5 technical background containing the design intent of a dynamic positioning system with indication of the equipment redundancy level for ships with distinguishing marks **DP2** or **DP3** in the class notation, with substantiation of the worst-case failure design intent when, after occurrence of the worst-case failure, the ship will be able to keep position and/or heading in the specified environmental conditions (\*);

.6 general arrangement plan of the dynamic positioning system equipment including thrusters, switchboards and panels of dynamic positioning system with indication of main and back-up (if any) control stations, position reference systems and external force sensors (\*);

.7 drawings of cable runs (power and control cables) with indication of their penetrations through watertight and fire-resisting bulkheads of ships with distinguishing mark **DP-3** in the class notation (\*);

.8 diagrams of power supply for automation systems listed in 4.2.14.2.1÷4.2.14.2.7.

##### 4.2.14.2 Documentation on individual automation systems and control and monitoring consoles:

.1 technical documentation on alarm and monitoring systems (AMS), centralized monitoring systems and integrated control systems and AMS, including functional diagrams, control console panels with indication of all devices;

.2 technical documentation on remote automated control for main machinery and propellers: including functional diagrams, remote automated control console panels with indication of all devices;

.3 technical documentation on automation of auxiliary engines and electric power plant, including functional diagrams, control console panels for electric power plant with indication of all devices;

.4 technical documentation on automation of boiler plant, including functional diagrams, control console panels with indication of all devices;

.5 functional diagrams of automation of compressor plants;

.6 functional diagrams of automation, including remote control, of bilge and ballast systems;

.7 functional diagrams of remote level indicating systems;

.8 diagrams of electric connections for automation systems and equipment listed in 4.2.14.2.1÷4.2.14.2.7, with indication of cable types and places of installation of all system elements and devices;

.9 drawings of front panels of desks and boards of control and alarm systems in the main machinery control room and on the navigation bridge with indication of all devices;

.10 structural and mounting drawings of consoles and control and monitoring switchboards as well as

mounting drawings of elements of automation systems and devices, sensors, signalling and instruments.

**.11** principal and functional diagrams of automation systems, supervised by the Register and listed in the relevant parts of the Rules, but not mentioned above;

**.12** technical background with description of operating conditions, operating principle, operating modes, with substantiation of dynamic positioning system redundancy level according to a distinguishing mark to be added to the class notation (\*\*);

**.13** failure modes and effects analysis (FMEA, refer to **8.2.1** of Part XV "Automation") of dynamic positioning system taking into account the design intent as specified in 3.2.8.1.4 (\*\*);

**.14.** list of critical components of dynamic positioning system (\*\*);

**.15** blackout recovery procedure for dynamic positioning system (\*\*);

**.16** capability plots demonstrating ship's position keeping capacity at least for fully effective dynamic positioning system and post worst-case failure condition for particular environmental conditions (\*\*);

**.17** functional diagrams of computer-based dynamic positioning control system with indication of inputs and outputs with feedbacks and power supplies (\*);

**.18** drawings of panels of main and back-up (for **DP-3**) control stations of dynamic positioning system with indication of location of controls, thruster emergency stops, alarm devices, indicators and internal communications (\*);

*Note.* Technical documentation listed in **4.2.14.2** shall be submitted by the designer or system integrator specified in **3.4.2.14.1.1**. In the latter case, the documentation shall be developed taking into account the solutions adopted in technical documentation listed in **4.2.14.1**, and submitted for approval at the stage of delivery and installation to the Register together with the documentation according to **1.4.1** of Part XV "Automation" of these Rules, approved under technical supervision of automation equipment.

#### **4.2.15 Documentation on arrangements and equipment for the prevention of pollution from ships:**

**4.2.15.1** For sea-going and sea river navigation ships the following is submitted:

**.1** general ship technical specification as part of the ship specification according to **4.2.2.1**, and an explanatory note on the carry out of requirements of MARPOL 73/78/97, Technical Code for NO<sub>x</sub>, the International Convention on the Control of Harmful Anti-fouling Systems on Ships (\*);

**.2** layout of equipment and devices for the prevention of pollution from ships, including collection tanks / reservoirs and removable devices for garbage collection;

**.3** calculations of capacity: tank / hold bilge tanks and oil residues (oily sludge) generated in machinery spaces; collection tanks / sewage tanks; garbage collection appliances (\*);

**.4** calculation of the sewage discharge rate; calculation of the untreated sewage discharge with the approved by the Administration maximum discharge rate (\*);

**.5** schemes of systems / pipelines: hold bilge water and oil residues (oily sludge) generated in machinery spaces; burning oil residues (oily sludge), if available on the vessel; marine oily water cleaning installations on 15 million<sup>-1</sup>; sewage on the ship; removal and delivery of sewage into receptacle facilities;

**.6** for oil tankers in addition to the documents referred to in **4.2.15.1.1 - 4.2.15.1.5**:

calculation of slop tanks and segregated ballast tanks capacity (\*);

calculation of accidental oil outflow (Regulation 23 of Annex I to MARPOL 73/78) (\*\*);

arrangement plan of cargo and slop tanks (\*) and calculation confirming their protective location relative to shell plating (Regulation 19 of Annex I to MARPOL 73/78) (\*\*);

arrangement plan of pump room (\*) and calculation confirming their protective location relative to shell plating (Regulation 22 of Annex I to MARPOL 73/78), if applicable (\*\*);

calculations of stability in intact condition and booklet on the balance and stability (for combined vessels with additional operational procedures for operations on pumping fluids (according to **3.1.11** and "Requirements to ships construction and their oil pollution prevention equipment" of Regulations for the Prevention of Pollution from Ships) (concerning calculations (\*);

subdivision diagram, calculations of emergency stability and information on loading and stowage of cargo and the emergency stability (concerning calculations (\*);

vapor collection system diagram;

emergency oil pumping diagram;

tanks crude oil washing scheme and shady chart (if applicable), small diameter pipeline diagram;  
discharge holes layout;

diagram of cargo tank cleaning and dirty ballast residue and wash water pumping from the cargo tanks to slop tank system; scheme of pumping and discharge of oil residues;

diagram of pumping and oil residues delivery system;

diagram of automatic measurement, registration and oil discharge control system of ballast and wash water.

.7 for ships carrying noxious liquid substances in bulk, in addition to the documents referred to in **4.2.15.1.1-4.2.15.1.5**:

arrangement plan of pump rooms;

diagram of cargo tank ventilation systems;

cargo and noxious liquid substances discharge system with arrangement plan of discharge outlets;

program for determining the quantity of residues of noxious liquid substances that are not pumped (in tanks, pumps, piping);

diagram of tanks wash and discharge of wash water.

.8 drawings of tanks for oily waste, sewage collecting tanks, removable devices for garbage collection and their equipment (can be provided as a part of working drawings and drawings of built-in tanks - as a part of hull construction drawings);

.9 diagram of collection tanks heating systems;

.10 description of the integrated ship oily bilge water treatment system (\*);

.11 description of the fuel oil tank protection (\*);

.12 description of the construction and list of ship's equipment for oil spill protection (\*), drawings of guarding, working platform, drainage systems with tanks;

.13 diagram of exhaust gas cleaning system in accordance with the NO<sub>x</sub> Technical Code;

.14 drawings of selective recovery chamber with catalytic recovery unit and reductant injection system (for diesel engines equipped with selective recovery system);

.15 lists of:

.15.1 equipment containing ozone-depleting substances;

.15.2 ozone-depleting substances - refrigerant applied in industrial and domestic refrigeration equipment;

.15.3 ozone-depleting substances extinguish fire (gallons) used to extinguish fires on board;

.16 principle diagram of equipment electrical supply and scheme of management, control, display, alarm and protection ship's pollution prevention systems (without schemes of the equipment);

.17 technical documentation on ship energy efficiency design index (EEDI) and the calculations EEDI required (for ships with a gross tonnage of 400 or more of types: bulk carrier, gas carrier, tanker, container ship for the transportation of general cargo, refrigerated vessel, combined ship, Ro-Ro cargo ship, Ro-Ro cargo ship (ship for carriage of vehicles), passenger ro-ro ship, other than vessels with diesel-electric, hybrid and turbine units, as well as for cruise passenger vessels with non-traditional propulsion gears, including vessels with diesel electric, and hybrid turbine installations) and attained energy efficiency index for specified types of ships and passenger ship, except that ship with diesel-electric, and hybrid turbine installations; and technical file according to Resolution MEPC.254(67) with amendments.

.18 description of the antifouling system in accordance with the provisions of the International Convention for the Control of Harmful Antifouling Systems on Ships, 2001, as well as Regulation (EC) No 782/2003 of the European Parliament and of the Council of 14.04.2003 on the prohibition of apply or re-apply organotin compounds that act as biocides in their anti-fouling systems from 1 January 2008 (for ships call to EU ports), for all Parties of the AFS Convention is mandatory from 17.09.2008;

.19 documents, approved by the Register, required on board before issuing appropriate certificates confirming compliance with the requirements of the MARPOL -73/78/97 and AFS International Convention;

.19.1 Ship oil pollution emergency plan (for oil tankers of 150 gross tonnage or more and vessels that are not oil tankers of 400 gross tonnage or more);

.19.2 Ship sea pollution with noxious liquid substances emergency plan (for a ship with a gross tonnage of

150 or more, for which a certificate for the transportation of hazardous liquid substances in bulk is issued).

Named plan may be combined with a plan to **.3.1** for specified in it ships with the title "Ship marine pollution emergency plan";

**.19.3** Garbage management plan (for ships with a gross tonnage of 100 or more accommodating on board 15 people and over, as well as stationary and floating platforms);

**.19.4** Ship Plan / Manual on systems of oily bilge water and oil residues (oily sludge) treatment (for oil tanker with a gross tonnage of 150 or more, for ships with a gross tonnage of 150 or more, for which a certificate for the transportation of hazardous liquid substances in bulk is issued and ships not an oil tanker with a gross tonnage of 400 or more);

**.19.5** Ship STS Plan - of operations (for oil tanker with a gross tonnage of 150 or more, which performs the transfer of oil cargo between oil tankers at sea («Ship - to - ship oil transfer operations at Sea»);

**.19.6** Ship volatile organic compounds (VOCs) vapor Management Plan (for oil tanker which transports crude oil);

**.19.7** Technical File of marine diesel engine or for engines of 5000 kW capacity and a cylinder volume of 90 liters or more installed on ships constructed on Jan. 1, 1990 or after, but up to 1 January 2000, the Technical file for approved appliances of ship diesel engine;

**.19.8** Guidance on monitoring NO<sub>x</sub> emission;

**.19.9** for vessels using the exhaust gas cleaning systems (EGCS)(unit) to reduce SO<sub>x</sub> emissions:

**.19.9.1** SO<sub>x</sub> Emission Compliance Plan (SECP);

**.19.9.2** Manual on EGC-SOX system operation (diagrams A or B) (for each EGC aggregate);

**.19.9.3** SO<sub>x</sub> Emission monitoring manual (EMM);

**.20** documents required on board in accordance with the requirements of the MARPOL -73/78/97 and AFS International Convention (subject to approval by the Register on obtaining the directive for document approval):

**20.1** Ship Energy Efficiency Management Plan (SEEMP) (for ships of 400 gross tonnage or more, except platforms (including floating receiving, storing and discharging installations and mobile offshore drilling units) (may be a part of the safety management system (SMS));

**20.2** Approved manual on methods and devices for cargo operations, tanks clearing, sinks flush operations, discharge of liquid residues of harmful substances and ballasting of the ship (for ships which are permitted to carry substances of categories X, Y or Z);

**.20.3** Operational documents required by the MARPOL-73/78/97:

**.20.3.1** Operating Instructions for volatile organic compounds vapour system (VOCs) (for tankers);

**.20.3.2** Operation Manual for shipboard incinerator;

**.20.3.3** Guidance on the operation and maintenance of separators for 15 million<sup>-1</sup> and 15 million<sup>-1</sup> alarm;

**.20.3.4** Guidance on equipment and operation of crude oil wash system (if applicable);

**.20.3.5** Approved Manual on operation of automatic measurement, registration and control oil discharge system and, if applicable, ballast and wash water, taking into account overlapping assets in case of failure of control systems;

**.20.3.6** Manual on operation and maintenance of wastewater treatment plants or plants for shredding and disinfecting of waste water (depending on which is installed on board).

*Note.* Documentation on **4.2.15.1.19** and **4.2.15.1.20**, subject to approval by the Register may be submitted for consideration at the stage of ship construction. In the case of submission of these documents without the data of a specific ship, incl. as part of the design documentation of the ship in construction, the documents are considered as preliminary with the subsequent entry into them of the relevant data of a particular ship taking into account, if any structural changes made during the construction of the ship, consideration and, if necessary, final approval.

**4.2.15.2** In construction documentation in accordance with **4.2.15.1** the specifications on equipment, appliances, fittings, materials, insulation, hydraulic tests are specified.

#### **4.2.16 Documentation on Tonnage Measurement of Ships.**

**4.2.16.1** To determine the gross and net tonnage of sea and sea river navigation vessel the following is submitted:

- .1 detailed calculation of gross and net tonnage (\*);
  - .2 arrangement plan of cargo spaces indicating their capacities;
  - .3 other drawings necessary for determining (calculations verification) of ship's volumes and capacities.
- In determining the tonnage the following documentation is used:  
theoretical drawing (refer to 4.2.7.1);

General arrangement plan (refer to 4.2.2.2);

**4.2.16.2** To determine the gross and net tonnage according to the Regulations for the Measurement of Tonnage for the Suez Canal and Rules for Measurement of Vessels for the Panama Canal and issued appropriate certificate, if required, appropriate calculation according above mentioned Rules to be submitted. (\*).

**4.2.17** Documentation for refrigerators is provided in 5.3.1.

### **4.3 PROGRAMMES OF MOORING AND SEA TRIALS**

**4.3.1** Programmes of mooring and sea trials shall be approved by the Register prior to commencement of the relevant trials.  
**4.3.2** The scope of mooring and sea trials shall comply with the relevant requirements of the Rules on technical supervision of the construction of ships and manufacture of materials and products.

**4.3.3** FMEA. Programmes of mooring and sea trials of the ships with additional distinguishing marks DP1 or DP2 should be consist full test of dynamic positioning system including according to provisions of FMEA.

### **4.4 TECHNICAL DOCUMENTATION FOR RENEWED VESSELS, CONVERTED OR RECLASSIFIED VESSELS**

**4.4.1** Prior to conversion or renewal of ships, which is classified or have been classified by the Register it is necessary to submit for review and approval technical documentation on those parts of the hull, machinery appliances and equipment subject to re-equipment or renewal, and in the effect of influence of reequipment or repair on the general technical characteristics of the ship (strength, stability, freeboard, maneuverability, etc. as well as appropriate calculations, or backgrounds and corrected general materials and documents.

**4.4.2** When installing on board new machinery and devices that are different from the original and which are subject to the requirements of the Rules, it is necessary to submit for consideration and approval of the Register additional technical documentation for new facilities related to these mechanisms or devices to the extent necessary for vessel in construction (refer to 4.1 and 4.2).

**4.4.3** It is necessary to provide overall strength calculation taking into account wear and the local residual deformations in the event of hull deformation and wear.

**4.4.4** During re-equipment of the ship for her reclassification the Register must be provided with regard to 4.1.3 and 4.2.1 the following documentation:

- .1 explanatory note with background of reclassification (\*);
- .2 analysis of ship compliance with requirements of applicable Rules, which were in force at the date when ship has been built, unless otherwise indicated in the following publications of Regulations or bulletins of additions and amendments to the Regulations issued after the publication of Regulations. (\*);
- .3 list of decisions that differ from the requirements of the applicable rules for the new class with backgrounds;
- .4 analysis of the ship compliance with the requirements of the applicable international regulations (\*);
- .5 amendments to the specification (\*);
- .6 trial program;
- .7 instructions for loading the ship, refer to 4.2.3.28, or additions to the available on the vessel (for vessels carrying cargo);
- .8 stability information (previous) or amendments to existing on board and stability calculation materials and on the basis of which it is composed;
- .9 information on the damaged trim and stability (floodability) (previous) or amendments to existing on board calculation materials and on the basis of which it is composed.;

Providing documents is allowed according to .8 and .9 as the combined document - Stability and floodability information and for small crafts with inclusion into the set of Manual for the owner;



**.10** additional calculations of general and local strength on the choice of reinforcement designs and sizes of hull members (\*);

**.11** technical documentation for assigning freeboard of sea and sea river navigation vessels, calculation of freeboard height and drawings of load line; (\*)

**.12** groundings, which confirm the ability of operation of the main engines, propulsion-steering gear and the ship's power plant without breach of their technical characteristics, which are determined by delivery documentation and Rules (\*);

**.13** technical documentation for reclassification of the vessel concerning the reinforcement of the hull, additional equipment and ship supply upon the results of analysis according to **.2** and calculations according to **.10**, including drawings of general location. The technical documentation concerning additional equipment of the vessel upon the results of analysis according to **.4**, including documents required by international conventions and codes;

**.14** calculations of maneuverability, including maneuverability table (for a small calculations of steerability for a sailing ship) (\*).

## 5. CLASSIFICATION OF REFRIGERATING PLANTS

### 5.1 GENERAL

**5.1.1** For ensuring safety of a ship and preventing ozone-destructive effect of refrigerants on environment the refrigerating plants installed in ships classed with the Register are subject to surveys in the following cases:

**.1** refrigerating plants working with Group II refrigerants in accordance with Table **2.2.1**, Part XII "Refrigerating Plants";

**.2** refrigerating plants working with Group I refrigerants and comprising the compressors with theoretical suction capacity 125 m<sup>3</sup>/h and above;

**.3** refrigerating plant ensures the functioning of systems affecting the ship safety.

**5.1.2** From the number of the refrigerating plants stated in **5.1.1** the Register assigns a class to:

**.1** refrigerating plants intended for developing and maintaining the required temperatures in refrigerated cargo spaces of transport ships, as well as in thermal containers to provide proper carriage of goods;

**.2** refrigerating plants intended for developing and maintaining the required temperatures in refrigerated cargo spaces, for cold-treatment of sea products (cooling, freezing) and supplying the cold necessary for operation of process plants in fishing ships and other ships used for processing of the biological resources of sea;

**.3** refrigeration plants designed to maintain the desired mode of carriage of liquefied gases in bulk on gas carriers.

Other refrigerating plants from the number of those stated in **5.1.1** are considered unclassified.

### 5.2 CLASS OF A REFRIGERATING PLANT

#### 5.2.1 General.

**5.2.1.1** The Register may assign a class to a refrigerating plant after the ship's construction, as well as assign, or renew a class of a refrigerating plant installed in a ship in service.

**5.2.1.2** Assignment or renewal of a class means that the refrigerating plant fully or to a degree considered acceptable by the Register complies with the relevant requirements of these Rules, and that the technical condition of the plant is in accordance with the provisions of design specifications included in the Classification Certificate for Refrigerating Plant.

**5.2.1.3** Assignment or renewal of a class shall be confirmed by the issue of a Classification Certificate for Refrigerating Plant after the appropriate survey carried out.

#### 5.2.2 Class notation of a refrigerating plant.

**5.2.2.1** The character of classification of a refrigerating plant consists of the following marks:

**REF** ⊕ – for a refrigerating plant built according to these Rules and surveyed by the Register;

**REF** ✦ – for a refrigerating plant built according to the rules of a classification society recognized by the Register, surveyed by that classification society and then classed by the Register;

**REF** ✦ – for a refrigerating plant built according to the rules of a classification society recognized by the Register, surveyed by that society during construction and subsequently classed by the Register, if the refrigerating plant does not fully comply with the requirements of Part XII "Refrigerating Plants of the Rules";

**(REF)** ✦ – for a refrigerating plant built without being surveyed by a classification society recognized by the Register or without being surveyed by a classification society at all, but subsequently classed with the Register.

#### 5.2.2.2 Mark of a capability to cargo refrigeration.

If the refrigerating plant has a capacity sufficient to refrigeration of a non-precooled cargo on shipboard during a period of time that provides preservation of that cargo, a distinguishing mark **PRECOOLING** shall be added to the character of classification.

In such a case a note specifying the conditions of cargo cooling on shipboard shall be entered into the Classification Certificate for Refrigerating Plant and in the Register of Ships.

#### 5.2.2.3 Mark of capability for cooling or freezing sea products.

The distinguishing mark **QUICK FREEZING** is added to the character of classification if the plant is intended for cooling or freezing sea products and is in accordance with the relevant requirements specified in Part XII "Refrigerating Plants".

#### 5.2.2.4 Distinguishing marks of refrigerating plants.

**5.2.2.4.1** If a refrigerating plant is intended for cooling of cargo transported in thermal containers and complies with applicable requirements of Part XII "Refrigerating Plants" the distinguishing mark **CONTAINERS** is added to the character of classification of the plant.

**5.2.2.4.2** If, in addition to a refrigerating plant, a ship is equipped with atmosphere control system in refrigerated spaces and/or thermal containers which complies with applicable requirements of Part XII "Refrigerating Plants" the distinguishing mark **CA** is added to the character of classification of the plant.

**5.2.2.4.3** If the refrigeration plant is designed to maintain the desired mode of carriage of liquefied gases in bulk on gas carriers, which complies with applicable requirements of Part XII "Refrigerating Plants" the distinguishing mark **LG** is added to the character of classification of the plant.

#### 5.2.3 Additional characteristics.

**5.2.3.1** Additional details of conditions for cooling cargoes on board, specified temperature conditions for transportation of cargoes and other details are indicated in the Classification Certificate for Refrigerating Plant and in the Register of Ships if it is found necessary by the Register to specify the purpose or structural features of the refrigerating plant.

**5.2.3.2** Number of thermal containers served by the refrigerating plant is indicated in the Classification Certificate for Refrigerating Plant and in the Register of Ships.

#### 5.2.4 Alteration of marks in class notation.

The Register may delete or alter a mark shown in the class notation in case of any modification or non-compliance with the requirements which served as the basis for the insertion of that mark into the class notation.

### 5.3 TECHNICAL DOCUMENTATION OF A REFRIGERATING PLANT

#### 5.3.1 Documentation of a classed refrigerating plant.

Prior to delivery of a refrigerating plant onboard the ship, documentation with a sufficient scope of information to prove that the requirements of the Register rules for a refrigerating plant are complied with shall be submitted to the Register for review:

- .1 technical description of a refrigerating plant (\*);
- .2 calculation of refrigeration capacity indicating heat load on from each cooled cargo space and technological consumption of cold (\*);
- .3 arrangement plan of refrigeration plant on board;
- .4 diagrams of main and emergency ventilation systems of refrigeration plant room and other facilities with the equipment under the pressure of the refrigerant with an indication of watertight and fire bulkheads and air exchange multiplicity;
- .5 circuit diagrams of refrigerant, cooling medium, cooling water systems with indication of places for installation of instruments and automatic devices;
- .6 air cooling system diagram indicating waterproof and fire-protection bulkheads;
- .7 arrangement plan of equipment in refrigerated spaces indicating escape routs;
- .8 arrangement plan of equipment in refrigerated spaces with indication of places for installation of temperature control devices;
- .9 construction plans of insulation of refrigerated spaces with specification of insulating materials;
- .10 diagram of the water screen in refrigerated spaces (for refrigerant of group II));
- .11 arrangement plan of cooling and refrigeration plants and other technological refrigeration equipment on the vesse;
- .12 circuit diagrams of automatic control, protection and alarm systems;

- .13 list of machinery, vessels and apparatus of refrigerating plant with indication of technical characteristics (\*);
- .14 list of control devices and measuring instruments, protection and alarm systems with indication of technical characteristics (\*);
- .15 tables of enclosing surfaces areas quantities of refrigerated cargo spaces with information about the estimated heat transfer coefficient of each surface and the average coefficient of heat insulation room design (\*);
- .16 drawings of air ducting of cargo cooling in thermally insulated containers with indication of distribution over the ship;
- .17 drawings of air ducting insulation with indication of details on materials;
- .18 drawings of sealing and flexible joints with indication of details on materials;
- .19 arrangement plan of gas environment composition control unit;
- .20 9 list of equipment of the atmosphere control system, including control and automatic devices (\*);
- .21 drawings of installation and fastening of machinery, vessels and apparatus;
- .22 refrigerant, coolant and cooling water piping arrangement drawings indicating the penetrations through bulkheads, decks and platforms;
- .23 drawings of emergency refrigerant discharge overboard station location;
- .24 spare parts list.

### **5.3.2 Test program.**

**5.3.2.1** Test program with indication of the method of design cooling load generation (including a calculation of the power of additional heaters to be used) and the method of determining the actual averaged heat-transfer coefficient for the insulating structure of refrigerated cargo spaces shall be approved by the Register prior to commencement of the relevant tests.

**5.3.2.2** The scope of tests shall comply with the relevant requirements of **11**, Part **5** «Technical Supervision during the construction of ships» of the Rules for Technical Supervision during Construction of Ships and Manufacture of Materials and Products for Ships.

### **5.3.3 Documentation of an unclassified refrigerating plant.**

5.3.3.1 Prior to delivery of a refrigerating plant on board the ship, documentation listed in 5.3.1.1.3–5.3.1.1.5 (for refrigerant only), 5.3.1.1.7, 5.3.1.1.10, 5.3.1.1.11 (only for devices operating under refrigerant pressure), 5.3.1.1.12 (for protection and alarm system only), 5.3.1.1.21, 5.3.1.1.22 (for refrigerant only), 5.3.1.1.23 shall be submitted to the Register.



*Veritas Register of Shipping LTD*

## **Rules for Classification and Construction of Sea Going Ships**

### **Part 1**

### **Classification**

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