

**RUSSIAN MARITIME REGISTER OF SHIPPING**

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**RULES**  
**FOR THE CLASSIFICATION**  
**AND CONSTRUCTION**  
**OF SEA-GOING SHIPS**

**PART I**  
**CLASSIFICATION**



Saint-Petersburg  
Edition 2019

Rules for the Classification and Construction of Sea-Going Ships of Russian Maritime Register of Shipping have been approved in accordance with the established approval procedure and come into force on 1 January 2019.

The present edition of the Rules is based on the 2018 edition taking into account the amendments developed immediately before publication.

The unified requirements, interpretations and recommendations of the International Association of Classification Societies (IACS) and the relevant resolutions of the International Maritime Organization (IMO) have been taken into consideration.

The Rules are published in the 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";

Part XVII "Distinguishing Marks and Descriptive Notations in the Class Notation Specifying Structural and Operational Particulars of Ships";

Part XVIII "Common Structural Rules for Bulk Carriers and Oil Tankers". The text of the Part is identical to that of the IACS Common Structural Rules;

Part XIX "Additional Requirements for Structures of Container Ships and Ships, Dedicated Primarily to Carry their Load in Containers". The text of the Part is identical to IACS UR S11A "Longitudinal Strength Standard for Container Ships" (June 2015) and S34 "Functional Requirements on Load Cases for Strength Assessment of Container Ships by Finite Element Analysis" (May 2015).

Parts I — XVII are published in electronic format in Russian and English. In case of discrepancies between the Russian and English versions, the Russian version shall prevail.

Parts XVIII — XIX are published in electronic format in English only.

*As compared to the 2018 edition, the present edition of the Rules contains the following amendments.*

## **RULES FOR THE CLASSIFICATION AND CONSTRUCTION OF SEA-GOING SHIPS**

### **PART I. CLASSIFICATION**

- 1.** Terms "glass reinforced ship", "ships constructed of glass-reinforced plastic" have been replaced by the term "fiber-reinforced plastic ship" throughout the text of this Part.
- 2.** Chapter 1.2: in para 1.2.2.8 the Rules' title has been specified.
- 3.** Chapter 2.2: in paras 2.2.2.2 and 2.2.2.3 the requirements have been specified;  
para 2.2.3.1.3 has been supplemented with definitions of ice types according to the "Sea Ice Nomenclature" of the World Meteorological Organization;  
in para 2.2.3.3.1 the requirement has been specified;  
paras 2.2.3.3.2 and 2.2.3.3.3 have been deleted;  
new para 2.2.3.3.2 containing description of ice classes in accordance with the RS rules has been introduced;  
para 2.2.3.3.4 has been renumbered as para 2.2.3.3.3;  
paras 2.2.3.4 — 2.2.3.5 and associated Tables 2.2.3.4-1 — 2.2.3.4-4 have been deleted;  
in paras 2.2.23 and 2.2.24 the Rules' title has been specified;  
new paras 2.2.38 — 2.2.41 containing description of new distinguishing marks and conditions of their assignment have been introduced;  
paras 2.2.38 and 2.2.39 have been renumbered as paras 2.2.42 and 2.2.43 accordingly;  
in existing para 2.2.38 the requirements have been specified in accordance with the IACS Common Structural Rules;  
existing para 2.2.39 has been amended.
- 4.** Chapter 2.3: para 2.3.2 has been amended considering IMO resolution A.1122(30).
- 5.** Chapter 3.1: in para 3.1.2 the requirements have been specified;  
new para 3.1.3 containing requirements for documentation on a similar ship constructed according to a new contract for construction;  
existing paras 3.1.3 — 3.1.6 have been renumbered as paras 3.1.4 — 3.1.7.
- 6.** Chapter 3.2: in paras 3.2.1.7, 3.2.2.17, 3.2.2.20, 3.2.2.23, 3.2.8 the requirements have been specified.
- 7.** Chapter 3.3: in para 3.3.2.15 the requirements have been specified;  
in para 3.3.9.4 the references have been specified.
- 8.** Chapter 3.4: para 3.4.8 has been amended.
- 9.** Chapter 3.5: in para 3.5.2 the requirements have been specified.
- 10.** Chapter 4.3: in para 4.3.2.2 the requirements have been specified.
- 11.** Editorial amendments have been made.

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# PART I. CLASSIFICATION

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## 1 GENERAL

### 1.1 DEFINITIONS AND EXPLANATIONS

Definitions and explanations pertinent to the general terminology used in the normative documents of the Register are given in Part I "General Regulations for Technical Supervision" of the Rules for Technical Supervision during Construction of Ships and Manufacture of Materials and Products for Ships.

For the purpose of the Rules for the Classification and Construction of Sea-Going Ships<sup>1</sup> the following definitions and explanations have been adopted (unless expressly provided otherwise in particular Parts of the Rules).

#### 1.1.1 Definitions.

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).

A **hopper barge** is a self-propelled or non-self-propelled ship intended for the carriage of spoil.

**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.

**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.

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).

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.

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.

**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.

A **bulk carrier** is a one deck ship with top-side and hopper-side tanks in cargo spaces which is primarily intended for the carriage of bulk cargoes.

This ship type also includes 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).

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<sup>1</sup>Hereinafter referred to as "the Rules".

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 2.2.31;

a **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, 55 °C and below for ships of inland navigation, Reid vapour pressure being below atmospheric pressure;

a **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;

a **oil tanker (>55 °C)** is a ship of inland navigation intended for the carriage of petroleum products having a flash point over 55 °C in bulk;

a **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;

a **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 and 1.5.9, Part VI "Fire Protection".

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 crossings.

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.

A **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 ones.

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).

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

**Special personnel** means all persons who are not passengers or members of the crew or children of under one year of age and who are carried on board in connection with the special purpose of that ship or because of special work being carried out aboard that ship. 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;

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.

A **berth-connected ship** is a non-self propelled floating facility, having the pontoon-type or ship-type hull, which is in operation either when lying at anchor or bottomed 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 of river-sea navigation** is a ship intended for navigation at sea and on inland waterways.

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 **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 RS rules are complied with.

A **special purpose ship** means a mechanically self-propelled ship which by reason of its function carries on board more than 12 special personnel, including passengers (the later 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.

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.

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.

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.

**Crew** means all persons carried on board the ship to provide navigation and maintenance of the ship, its machinery, systems and arrangements essential for propulsion and safe navigation or to provide services for other persons on board.

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

Definitions of particular types of ships (nuclear ships and floating facilities, nuclear support vessels, high-speed craft, dynamically supported craft, WIG craft, gas carriers, chemical tankers, pleasure craft, drilling ships, mobile offshore drilling units and fixed offshore platforms, manned submersibles and diving systems) are given in relevant rules for the classification and construction of such types of ships.

The RS rules are listed in 1.3, General Regulations for the Classification and Other Activity.

### **1.1.2 Explanations.**

For the purpose of these Rules classification means development, publication and application of the rules continuous compliance with which will, along with the proper maintenance of the ship by the owner or by the operator, ensure:

structural strength and integrity of the hull and its elements including structural fire protection;

seaworthiness (stability) of the ship under all specified loading conditions and under particular sea-and-wind conditions;

safe and reliable operation of its propulsion plant, systems and devices for ship control, other systems, auxiliary machinery and equipment including fire-fighting equipment, and thereby permit safe operation of the ship in accordance with its purpose.

**D a t e o f c o n t r a c t f o r c o n s t r u c t i o n o f a s h i p ( s e r i e s o f s h i p s ) :**

**.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:** 1. 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.

2. This explanation became effective on 1 July 2009.

**A d d i t i o n a l r e q u i r e m e n t s** are the requirements caused by the item features or its operational conditions, which are not stipulated by the rules imposed by the Register in writing to ensure the safety of items of technical supervision.

**M e a s u r e m e n t o f d i s t a n c e s** — 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.

**T h e R e g i s t e r c l a s s ( c l a s s )** 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 RS rules.

**A n o p e r a t o r** is a physical person or legal entity operating a ship on the basis of a contract concluded with an owner or shipowner.

**R u l e s ( t h e R S r u l e s )** are the set of the regulating and technical requirements for objects under technical supervision.

The RS rules are listed in 1.3, General Regulations for the Classification and Other Activity.

**A n o w n e r** 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.



**Dual class** is a class of a ship classed with two societies entered into an agreement on a dual class.

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

**Standards**, as applied to the RS rules, means all kinds of standards and other regulating and technical documents of all countries approved or recognized by the Register.

**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.

**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.

## **1.2 APPLICATION**

**1.2.1** Rules for the Classification and Construction of Sea-Going Ships apply to:

**.1** self-propelled passenger and cargo ships with the main engines of output 55 kW and upwards;

**.2** non-self-propelled ships of 80 gross tonnage and upwards, including those fitted out with machinery and equipment of total prime movers power output 100 kW and upwards;

**.3** materials and products that shall be installed on the above ships (lists of relevant materials and products are given in the appropriate parts of these Rules);

**.4** ship refrigerating plants stated in 4.1.1 of this Part.

**1.2.2** These Rules also apply to the following types of ships and floating facilities to the extent specified in the relevant rules for their classification and construction:

**.1** nuclear ships and floating facilities (refer to the Rules for the Classification and Construction of Nuclear Ships and Floating Facilities);

**.2** nuclear support vessels (refer to the Rules for the Classification and Construction of Nuclear Support Vessels);

**.3** gas carriers (refer to the Rules for the Classification and Construction of Ships Carrying Liquefied Gases in Bulk and Rules for the Classification and Construction of Ships Carrying Compressed Natural Gas);

**.4** chemical tankers (refer to the Rules for the Classification and Construction of Chemical Tankers);

**.5** mobile offshore drilling units and fixed offshore platforms (refer to the Rules for the Classification, Construction and Equipment of Mobile Offshore Drilling Units and Fixed Offshore Platforms);

**.6** high-speed craft (refer to the Rules for the Classification and Construction of High-Speed Craft);

**.7** type A WIG craft (refer to the Rules for the Classification and Construction of Type A WIG Craft);

**.8** manned submersibles, ship's diving systems (refer to the Rules for the Classification and Construction of Manned Submersibles and Ship's Diving Systems);

**.9** pleasure craft (refer to the Rules for the Classification and Construction of Pleasure Craft);

**.10** small sea fishing vessels (refer to the Rules for the Classification and Construction of Small Sea Fishing Vessels);

**.11** floating offshore oil-and-gas production units (refer to the Rules for the Classification, Construction and Equipment of Floating Offshore Oil-and-Gas Production Units).

**1.2.3** With the Register consent, these Rules may be applied for the classification of ships not specified in 1.2.1 and 1.2.2.

**1.2.4** These Rules apply to special purpose ships of not less than 500 gross tonnage. On agreement with the Register, the requirements of these Rules may also apply as far as reasonable and practicable to special purpose ships of less than 500 gross tonnage.

**1.2.5** These Rules set down the requirements regulating the assignment of class to a ship or a shipboard refrigerating plant.

**1.2.6** Confirmation of compliance with the requirements of the RS rules is the Register prerogative and is carried out in accordance with the procedure established by it.

Any statements to the effect a supervised item complies with the RS rules requirements, which are made or documentally supported by a body other than the Register and which are not confirmed by the latter in accordance with the established procedure, cannot be considered as evidence of such a compliance.

### **1.3 COMPLIANCE WITH STATUTORY REQUIREMENTS**

**1.3.1** As far as practicable, the RS rules consider the requirements of international conventions and codes coming within the Register terms of reference (refer to 2.5, General Regulations for the Classification and Other Activity). Some of them are directly incorporated in the text of the RS rules, while others are referred to in the text of the RS rules.

## **2 CLASS OF A SHIP**

### **2.1 GENERAL**

**2.1.1** Assignment of the Register class to a ship means confirmation by the Register that the ship construction complies with the applicable requirements of the RS 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.

**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 construction and technical condition of the ship comply with the provisions based on which a class has been assigned as well as extension of validity of the Register documents for a definite period as required by the RS rules.

**2.1.4** Class of a ship is, generally, assigned or renewed by the Register for 5 years, however, in sound cases the Register may assign or renew a class for a lesser 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 RS 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 or the Statement of Laid-up Ship (in case the ship is laid up in compliance with the requirements of 4.10, Part II "Survey Schedule and Scope" of the Rules for the Classification Surveys of Ships in Service) available on board.

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

if 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 or if in RS rules it is not required otherwise;

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, if the accident took place at sea);

if alterations not agreed with the Register have taken place in the construction and/or if any change has been made in the equipment which may result in reducing the standards required by the RS rules;

when repair of ship's items has been performed without the agreement and/or survey by the Register;

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;

if 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;

if the process of surveying the ship by the Register has been suspended on the shipowner's initiative or through his fault;

when the ship has been taken out of service for a long period (more than 3 months) for fulfillment 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.

The Register shall specially notify the shipowner of suspension of a ship's class and Classification Certificate.

**2.1.7** Ship class and Classification Certificate may be suspended following a decision made by the Register when the commitments to the Register (including those on payment for its services) fail to be performed or are improperly performed as well as in other cases specified in the RS rules.

**2.1.8** 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.

During the period from suspension of a class to its reinstatement or renewal the ship is considered to have been lost the Register class.

The class may be suspended for a period of no more than six months unless expressly provided otherwise by the RS rules and normative documents.

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

- .1** upon expiration of the maximum term of class suspension;
- .2** when the Register and/or shipowner consider reinstatement of the class suspended as stated in 2.1.6 to be impossible;
- .3** upon transfer of the ship to the class of another classification body;
- .4** at the request of the shipowner.

Withdrawal of the ship's class means cessation of the Classification Certificate validity.

**2.1.10** The class of a ship shall be cancelled due to her loss or scrapping.

**2.1.11** After assigning the class the Register introduces the sea-going self-propelled ships and self-propelled mobile offshore drilling units of 100 gross tonnage and upwards into the Register of Ships and excludes them in case of withdrawal or cancellation of a class.

## **2.2 CLASS NOTATION OF A SHIP**

Ships and floating facilities, complying fully or to a degree considered adequate by the Register with the relevant requirements of the RS rules, are assigned the RS class with the class notation as specified below.

The class notation assigned by the Register to a ship or floating facility consists of the character of classification and distinguishing marks and descriptive notations defining structure and purpose of a ship or floating facility.

The sequence of distinguishing marks and descriptive notations (if any) being added to the character of classification of a ship is set down by the provisions of this Chapter as well as by relevant provisions concerning the class notation included in rules for the classification and construction of ships of special types, as listed under 1.2.2.

**2.2.1** The character of classification assigned by the Register to a ship or floating facility consists of distinguishing marks:

**KM**⊕, **KM**★, **(KM)**★ — for self-propelled ships and floating facilities;

**KE**⊕, **KE**★, **(KE)**★ — for non-self-propelled ships and floating facilities with total power output of prime movers 100 kW and upwards;

**K**⊕, **K**★, **(K)**★ — for other non-self-propelled ships and floating facilities.

**2.2.2** Depending on the rules on the basis of which a ship or a floating facility was surveyed, and the classification society which carried out the survey, the character of classification is established as follows:

**.1** ships and floating facilities built according to the Rules of and surveyed by the Register are assigned a class notation with the character of classification: **KM**⊕ or **KE**⊕ or **K**⊕ (refer to 2.2.1);

.2 ships and floating facilities built according to the rules of ACS – IACS member and surveyed by that society during their construction, when classed with the Register are assigned a class notation with the character of classification: **KM★** or **KE★** or **K★** (refer to 2.2.1). For ships classed within IACS procedural requirement (PR)1A, the provisions of 1.2.2, Part II "Survey Schedule and Scope" of the Rules for the Classification Surveys of Ships in Service shall apply;

.3 ships and floating facilities which were as a whole (or their hull or machinery installation, machinery and equipment) built and/or manufactured without being surveyed by ACS — IACS member or without any survey of a classification society at all, when classed with the Register, are assigned a class notation with the character of classification: **(KM)★** or **(KE)★** or **(K)★** (refer to 2.2.1). For ships classed within IACS PR1D the provisions of 1.2.3, Part II "Survey Schedule and Scope" of the Rules for the Classification Surveys of Ships in Service shall apply;

.4 for ships and floating facilities classed with the Register (with the character of classification assigned in compliance with 2.2.2.1) along with another classification society (dual class), the distinguishing mark **⊕** is used instead of **⊗** in the RS class notation.

In this case, classification societies carrying out classification surveys of ships (floating facilities) act under dual class agreement.

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

**2.2.3.1** Ice class marks are assigned to icebreakers and ice class ships in compliance with the requirements of 2.2.3.2 — 2.2.3.5 of this Part.

The IACS polar class notations are assigned to polar class ships in accordance with the requirements of Section 1, Part XVII "Distinguishing Marks and Descriptive Notations in the Class Notation Specifying Structural and Operational Particulars of Ships".

The Baltic ice class notations are assigned to the Baltic ice class ships in compliance with the requirements of Section 10, Part XVII "Distinguishing Marks and Descriptive Notations in the Class Notation Specifying Structural and Operational Particulars of Ships".

The IACS polar class notations and the Baltic ice class notations are assigned at the shipowner's discretion. At the same time, for the RS-classed ships intended for operation in Russian arctic seas as well as for icebreakers, the Register ice class marks are assigned in compliance with the requirements of 2.2.3.2 and 2.2.3.3.3 of this Part.

At the shipowner's discretion the IACS polar class notations and the Baltic ice class notations may be applied simultaneously with the Register ice class marks (double or triple ice class), provided such ships comply with the requirements for the IACS polar class ships and/or the Baltic ice class ships, and the Register ice class ships.

**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. 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:

**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;

**multi-year ice** — ice of thickness more than 3,0 m, which has survived at least two summers' melt;

second-year ice — ice of thickness from 2,0 to 3,0 m, which has survived only one summer's melt;

first-year ice — ice of thickness from 0,7 to 1,4 m, of not more than one winter's growth;

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

**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: **Icebreaker6**, **Icebreaker7**, **Icebreaker8**, **Icebreaker9**.

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

**Icebreaker6** — intended for ice breaking operations in harbour and roadstead water areas as well as in non-arctic freezing seas where the ice is up to 1,5 m thick. Continuous motion capability in unbroken ice up to 1 m thick;

**Icebreaker7** — 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 non-arctic 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;

**Icebreaker8** — 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;

**Icebreaker9** — 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**, **Arc4**, **Arc5**, **Arc6**, **Arc7**, **Arc8**, **Arc9** and the compliance of hull (**hull**) and minimum required power delivered to propeller shaft (**power**) with the requirements applicable to this ice class mark and specified in 3.10, Part II "Hull" and 2.1, Part VII "Machinery Installations" of these Rules accordingly shall be indicated in brackets, e.g. **KM⊗ Arc4 (hull; power)**. In case the ice strengthening of the ship corresponds to one ice class and the minimum required power corresponds to another ice class, the applicable ice classes shall be specified separately, e.g. **KM⊗ Arc4 (hull) Ice3 (power)**. Ice class marks shall not be added to the character of classification of non-self-propelled ships.

**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

Ice class	Description
<b>Arc9</b>	In summer/autumn navigation – voyage in all areas of the World Ocean. In winter/spring navigation in Arctic – voyage in very close floating ice and in compact multi-year ice of up to 3,5 m thickness and in freezing non-arctic seas without restrictions.
<b>Arc8</b>	In summer/autumn navigation – voyage in all areas of the World Ocean. In winter/spring navigation in Arctic – voyage in close floating second-year ice up to 2,1 m thickness and in freezing non-arctic seas without restrictions
<b>Arc7</b>	In summer/autumn navigation – voyage in all areas of the World Ocean. In winter/spring navigation in Arctic – voyage in close floating first-year ice up to 1,4 m thickness and in freezing non-arctic seas without restrictions
<b>Arc6</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 seas
<b>Arc5</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>Arc4</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 conditions
<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 the compliance with the appropriate ice class requirements, one of the following ice class marks is added to the character of classification: **Ice2**, **Ice3**, **Arc4**, **Arc5**.

#### 2.2.4 Subdivision distinguishing marks.

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 added to the character of classification, respectively.

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

2.2.5.1 Ships complying with these Rules requirements provided for ships operating only in restricted areas of navigation are assigned one of the following distinguishing marks: **R1**, **R2**, **R2-RSN**, **R2-RSN(4,5)**, **R3-RSN** or **R3** added to the character of classification to clarify restrictions of the ship navigation as follows:

.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-RSN** — 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;

.4 **R2-RSN(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:

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;

.5 **R3-RSN** — river-sea navigation at seas with a wave height of 3,5 m with 3 % probability of exceeding level with due regard for particular restrictions on the area and conditions of navigation resulting from the wind and wave conditions of the basins with determination of a maximum allowable distance from the place of refuge which in no case shall be more than 50 miles;

.6 **R3** — harbour, roadstead and coastal navigation within limits established by the Register in each case.

Restrictions for particular floating crane operations (cargo-handling operations or navigation with eventual carriage of cargoes on deck and/or in the hold) shall be imposed by the Register in each particular case;

.7 **Berth-connected ship** (with indication of the positions of stay and geographical service area according to Fig. 4.3.3.6, Part IV "Stability").

2.2.5.2 The restrictions provided for by 2.2.5.1 define the allowable conditions of ship's navigation resulting from ship's stability and strength which are indicated in the Seaworthiness Certificate and in the Classification Certificate.

2.2.5.3 Particular restrictions on the area and conditions of navigation for ships of river-sea navigation **R3-RSN** are determined as the geographical place names of basins or their parts with the indication, where necessary, of the geographical boundary of the navigation area within the basin, the restrictions on proceeding from the place of refuge and the restrictions of ship navigation by calendar periods, or an indication of voyage between the terminal ports. In this case, the restrictions with due regard to the wind and wave conditions of the basins shall be determined by using the data of Table 2.2.5.3 or the data from the submitted to the Register justifications of possibility of ship's navigation in the certain area or passage, made in accordance with the procedure approved by the Register.

Table 2.2.5.3

Basin	Geographical restrictions	Navigation season
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 Bari, 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
The Sea of Azov	No restrictions	Throughout the year
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 Barents Sea	10-mile coastal area to the east of Cape Kanin Nos along the coast of the Kanin Peninsula, and to the south of 68°00'N	June — August
	20-mile coastal area along the southern coast from Cape Svyatoy Nos (Timansky) to Pechorskaya Guba bay with calls at Remenka bay on the southern coast of Kolguev Island	June — September
	20-mile coastal area along the southern coast from Pechorskaya Guba bay to the Yugorsky Shar Strait; Pechorskaya Guba bay; Khaypudyrskaya Guba bay; the Yugorsky Shar Strait	June — October
	Coastal area along the Kola Peninsula within the boundaries of established ship traffic from the line connecting the Lumbovsky Gulf with Cape Kanin Nos to Kola Bay; Kola Bay	May — September
The White Sea	The Gulf of Onega, the Gulf of Dvina and the Gulf of Kandalaksha; 20-mile coastal area to the south of 66°45'N	May — October
The Bering Sea	20-mile coastal area of the Gulf of Anadyr in the following areas: the sea port of Anadyr — the sea port of Beringovskiy; the sea port of Anadyr — the sea port of Egvekinot — the sea port of Provideniya — the Gulf of Lavrentiya	July — September
The East Siberian Sea	Coastal area along the southern coast within the limits up to 15-meter isobath curve from the mouth of the Kolyma River to the sea port of Pevek with permissible distance from the coast up to 7 miles in the area of Letyatkina Cape, Bolshoy Baranov Cape, Malaya Baranikha Cape, the mouth of the Milkera River and the north-western coast of Ayon Island	August — September <sup>1</sup>
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 Kara Sea	10-mile coastal area from the Yugorsky Shar Strait to Kharasavey village; Baidaratskaya Guba bay	July — October
	The south-west part of the sea to the south of the line connecting Kharasavey village and the crossing point of 70°00'N with the eastern coast of the Vaygach Island	July — September
	20-mile coastal area along the western and northern coast of the Yamal Peninsula from Kharasavey village to Obskaya Guba bay through the Malygina Strait	August — October
	20-mile coastal area from Dickson Island to the mouth of Pyasina	July — September
The Caspian Sea	To the north of 44°30'N as well as to the south of 44°30'N within 20-mile coastal area along the eastern coast up to the port of Turkmenbashi (port of Bekdash) <sup>2</sup> and along the western coast up to the port of Makhachkala; 20-mile coastal area from the port of Baku to Anzali, with permissible distance from the coast up to 25 miles in the area from Shakhovaya Spit (39°50'N, 50°20'E) to Kurinskaya Spit (39°00'N, 49°44'E); sea crossing line from the eastern coast in the area of the port of Turkmenbashi (port of Bekdash) — southern extremity of the Krasnovodsky Gulf to the western coast in the area of Shakhovaya Spit	March — November
The Laptev Sea	the Khatanga Gulf; the Vostochny and Severny straits; 20-mile coastal area along the northern and eastern coasts of Bolshoy Begichev Island and from the Nordvik Peninsula to Cape Terpyay-Tumsa; the Gulf of Anabar; the Olenek Gulf limited by the line 5 miles distant to the north from the line connecting Cape Terpyay-Tumsa and the northern extremity of the Aerosemki Islands; 5-mile area around the Aerosemki Islands; 25-mile area from the Aerosemki Islands to the sea port of Tiksi; 20-mile coastal area from Cape Bykovto the mouth of the Yana River, including the Guba Buor-Khaya bay	20 July — September



Table 2.2.5.3 — continued

Basin	Geographical restrictions	Navigation season
The Laptev Sea and the East-Siberian Sea	20-mile coastal area along the southern coast from the mouth of the Yana River to the mouth of the Kolyma River; 20-mile coastal area along the southern and western coast of Bolshoy Lyakhovsky Island from Cape Shalaurov to Cape Vagin	20 July — September
	20-mile coastal area around Maly Lyakhovsky Island and along the southern and western coasts of Kotelny Island from the Malygintsev Bay to Stantsiy Lagoon; sea area between the northern coast of Bolshoy Lyakhovsky Island and south-western coast of Kotelny Island, and between 140°E and the western extremity of Kotelny Island	August — September
The Sea of Marmora	No restrictions from Bosphorus to Dardanelles Straits	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
The North Sea	Kattegat to the south of parallel 57°45'N; Helgoland Bay to the south of parallel 54°02'N and to the east to 7°5'E	Throughout the year
	Coastal area along the southern coast in the zone of traffic separation from the Helgoland Bay to the port of Antwerp	March — October
	Skagerrak Strait to the east of the line of Cape of Skagen – Oslo-Fjord and to the south of parallel 59°N and also along the coast of Sweden in Sekken and Single-Fjord Straits	May — August
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 Black Sea	20-mile coastal area except for the coastal area of the eastern and southern coasts of the port of Tuapse to the Strait of Bosphorus	Throughout the year
	20-mile coastal area along the eastern coast from the port of Tuapse to the port of Batumi	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 Sea of Japan and the Sea of Okhotsk	The Tatar Strait and the Amur Firth to the north of the line connecting the sea port of Sovetskaya Gavan and Uglegorsk City to the line connecting Cape Menshikova and Cape Tamlavo	June — October
	20-mile coastal area along the western coast from the port of Vladivostok to Preobrazhenia Bay	Throughout the year
<p><sup>1</sup>In the years of low and medium ice coverage to be determined by the position of Ayon ice massif.  <sup>2</sup>For ships having the Register-approved area of navigation to the south of the port of Turkmenbashi (the port of Bekdash) within 20-mile coastal area along the eastern coast up to ports of Iran, from Cheleken Peninsula (at 39°26'N, 52°40'E) up to the southern extremity of Ogurchinsky Island (at 38°40'N, 53°00'E), the 20-mile coastal area shall be counted from the coast of Oguschinsky Island.</p>		

**2.2.5.4** Notwithstanding the area of navigation of ships, whose stability does not comply with the requirements of part IV "Stability" imposed upon ships navigating to the north of parallel 66°30' and to the south of parallel 60°00' as well as in winter in the Bering Sea, the Sea of Okhotsk and in the Tatar Strait, or within seasonal winter zones in winter, determined in LL-66/88 or the Load Lines Rules for Sea-Going Ships, the Register specifies the appropriate restrictions by introducing the entry into the Classification Certificate in section "Permanent restrictions" about impossibility of the ship to navigate in the above mentioned seasonal winter zones and water areas.

**2.2.6 Distinguishing automation marks.**

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";

**.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".

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

If the navigational equipment of self-propelled ship installed on the navigation bridge complies with the requirements for self-propelled one man bridge operated ships specified in Part V "Navigational Equipment" of the Rules for the Equipment of Sea-Going Ships, a distinguishing mark **OMBO** 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** are added to the character of classification proceeding from the degree of the ship equipment with these appliances.

The degree of the ship equipment for fire fighting in other structures is determined on the basis of the list of fire fighting equipment and systems prescribed by 6.6, Part VI "Fire Protection".

#### **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: **DYNPOS-1, DYNPOS-2** or **DYNPOS-3** 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 ship is fitted with the position mooring system, one of the following distinguishing marks is added to the character of classification:

**.1 POSIMOOR** — if the position mooring system meets the requirements of 9.1 — 9.3, Part XV "Automation";

**.2 POSIMOOR-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 Section 4, Part XVII "Distinguishing Marks and Descriptive Notations in the Class

Notation Specifying Structural and Operational Particulars of Ships", the distinguishing mark **ANTI-ICE** is added to the character of classification.

**2.2.14 Distinguishing mark for a ship intended for carriage of packaged irradiated nuclear fuel, plutonium and high-level radioactive wastes (INF cargo).**

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 1.4.9.4 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 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 ship is fitted 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 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 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 Section 3, Part XVII "Distinguishing Marks and Descriptive Notations in the Class Notation Specifying Structural and Operational Particulars of Ships" are assigned with one of the following distinguishing marks added to the character of classification:

**.1 ECO** — if a ship meets the requirements for controlling and limiting operational emissions and discharges, as well as requirements for prevention of environmental pollution in case of emergency, as specified in 3.5, Part XVII "Distinguishing Marks and Descriptive Notations in the Class Notation Specifying Structural and Operational Particulars of Ships";

**.2 ECO-S** — if a ship meets more stringent requirements than those for assignment of the distinguishing mark **ECO** in the class notation, as specified in 3.5, Part XVII "Distinguishing Marks and Descriptive Notations in the Class Notation Specifying Structural and Operational Particulars of Ships".

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

If a ship performs ballast water management through ballast water exchange at sea and, as appropriate, carries the Guidelines for Safe Ballast Water Exchange at Sea approved by the Register (refer to 1.4.13, Part IV "Stability"), and the ship ballast systems comply with the requirements of 8.7, Part VIII "Systems and Piping", 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.

**2.2.22 Distinguishing mark for ships fitted with ballast water management system.**

If a ship performs ballast water management through the ballast water management system (BWMS) having the Type Approval Certificate of Ballast Water Management System issued in accordance with IMO resolution MEPC.174(58), and carries an approved operations and technical manual for the BWMS specific to the ship, a distinguishing mark **BWM (T)** is added to the character of classification. **BWM** means that the ship performs ballast water management in accordance with the approved Ballast Water Management Plan, and **T** means that ballast water management through treatment of the ballast water within the BWMS is carried out in compliance with the ballast water performance standard in regulation D-2 of the International Convention for the Control and Management of Ships' Ballast Water and Sediments, 2004.

**2.2.23 Distinguishing marks for a ship fitted with a diving system permanently installed on the ship.**

If ships are fitted with diving system installed permanently on ships that complies with the relevant requirements of the Rules for the Classification and Construction of Manned Submersibles and Ship's Diving Systems, one of the following distinguishing marks may be added to the character of classification:

**.1 SDS<12** for ships fitted with a diving system designed for diving operations at depths less than 12 m;

**.2 SDS<60** for ships fitted with a diving system designed for diving operations at depths less than 60 m;

**.3 SDS ≥ 60** for ships fitted with a diving system designed for diving operations at depths of 60 m and over.

**2.2.24 Distinguishing mark for ships fitted with manned submersible.**

If ships are fitted with manned submersible complying with the relevant requirements of the Rules for the Classification and Construction of Manned Submersibles and Ship's Diving Systems, the distinguishing mark **MS** may be added to the character of classification.

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

Oil tankers to carry out cargo operations at offshore terminals in compliance with the requirements of Section 5, Part XVII "Distinguishing Marks and Descriptive Notations in the Class Notation Specifying Structural and Operational Particulars of Ships" 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;

**.2 BLS** — if a ship is fitted with the bow loading system and complies with the requirements for equipment of oil tankers to carry out cargo operations at offshore terminals, except for 5.6.2 — 5.6.9 and 5.6.12 — 5.6.14, Part XVII "Distinguishing Marks and Descriptive Notations in the Class Notation Specifying Structural and Operational Particulars of Ships";

**.3 SPM** — if a ship is not fitted with the bow loading system, though complies with the requirements of 5.6.2 — 5.6.9 and 5.6.12 — 5.6.14, Part XVII "Distinguishing Marks and Descriptive Notations in the Class Notation Specifying Structural and Operational Particulars of Ships".

This distinguishing mark may also be added to the character of classification of ships carrying liquefied gases in bulk.

**2.2.26 Distinguishing mark for a ship fitted with helicopter facilities.**

If ships are fitted with helicopter facilities in compliance with the requirements of Section 6, Part XVII "Distinguishing Marks and Descriptive Notations in the Class Notation Specifying Structural and Operational Particulars of Ships", 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 6.2, 6.3, 6.4.1, 6.6 and 6.7, Part XVII "Distinguishing Marks and Descriptive Notations in the Class Notation Specifying Structural and Operational Particulars of Ships";

**.2 HELIDECK-F** — if a ship is fitted with helicopter refuelling facilities and, in addition to 2.2.25.1, complies with the requirements of 6.4.2 (as far as applicable), 6.5.1 and 6.5.2 (as far as applicable), Part XVII "Distinguishing Marks and Descriptive Notations in the Class Notation Specifying Structural and Operational Particulars of Ships";

**.3 HELIDECK-H** — if a ship is fitted with hangar facilities and fully complies with the requirements of Section 6, Part XVII "Distinguishing Marks and Descriptive Notations in the Class Notation Specifying Structural and Operational Particulars of Ships".

**2.2.27 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 Section 7, Part XVII "Distinguishing Marks and Descriptive Notations in the Class Notation Specifying Structural and Operational Particulars of 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)**.

**2.2.28 Distinguishing mark for propulsion plant redundancy.**

Where provision is made for the redundancy of propulsion plant components complying with the requirements of Section 8, Part XVII "Distinguishing Marks and Descriptive Notations in the Class Notation Specifying Structural and Operational Particulars of the Ship", one of the following distinguishing marks is added to the character of classification: **RP-1**, **RP-1A**, **RP-1AS**, **RP-2** or **RP-2S**, depending on the redundancy arrangement.

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

If ships are equipped for using gas fuel in compliance with Section 9 of Part XVII "Distinguishing Marks and Descriptive Notations in the Class Notation Specifying Structural and Operational Particulars of Ships", the distinguishing mark **GFS** (gas fuelled ships) is added to the character of classification.

**2.2.30 Distinguishing mark for ships fitted with a machinery technical condition monitoring system.**

If a ship is fitted with a machinery technical condition monitoring system meeting the requirements of Section 11, Part VII "Machinery Installations" of these Rules, and the Planned Maintenance Scheme (PMS) is implemented/applied for the ship in compliance with the requirements of 2.7, Part II "Survey Procedure and Scope" of the Rules for the Classification Surveys of Ships in Service, a distinguishing mark **PMS** may be added to the character of classification.

**2.2.31 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.**).

**2.2.32 Distinguishing mark for ships fit for carriage of dangerous goods.**

If a ship complies with the requirements of Section 7, Part VI "Fire Protection", was duly surveyed according to 2.1.5, Part III "Survey of Ships in Compliance with International Conventions, Codes, Resolutions and Rules for the Equipment of Sea-Going Ships" of the Guidelines on Technical Supervision of Ships in Service, and is recognized fit for carriage of dangerous goods, 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.

**2.2.33 Distinguishing mark for implementation of modified survey of the shafting.**

If a modified survey of the shafting in compliance with the requirements 2.10.2.7, Part II "Survey Schedule and Scope" of the Rules for the Classification Surveys of Ships in Service is accepted for a ship, the distinguishing mark **TMS** (Tailshaft Modified Survey) is added to the character of classification.

**2.2.34 Distinguishing mark for ships prepared for in-water survey.**

For a ship built according to Section 12 of Part XVII "Distinguishing Marks and Descriptive Notations in the Class Notation Specifying Structural and Operational Particulars of Ships", the distinguishing mark **IWS** is added to the character of classification.

**2.2.35 Distinguishing mark for alternative method of reducing (SO<sub>x</sub>) emissions.**

If on board a ship, as an alternative, the exhaust gas (SO<sub>x</sub>) cleaning system of the fuel oil combustion unit approved by RS is fitted, considering IMO resolution MEPC.184(59), the distinguishing mark **SO<sub>x</sub> Cleaning** is added to the character of classification.

**2.2.36 Distinguishing mark for marine diesel engine to comply with Tier III limit according to Regulation 13 of Annex VI to MARPOL.**

If nitrogen oxides emissions from marine diesel engines comply with Tier III limit and Regulation 13 of Annex VI to MARPOL, which is endorsed by the Engine International Air Pollution Prevention Certificate (EIAPP Certificate), the distinguishing mark **DE-Tier III** is added to the character of classification.

**2.2.37 Distinguishing mark for ships prepared for conversion for the use of gas fuel.**

If a ship is prepared for conversion for the use of gas fuel and complies with the requirements of Section 14, Part XVII "Distinguishing Marks and Descriptive Notations in the Class Notation Specifying Structural and Operational Particulars of Ships", at the shipowner's discretion, the distinguishing mark **GRS** (Gas Ready Ship) or one of the following distinguishing marks shall be added to the character of classification: **GRS-D**, **GRS-H**, **GRS-T**, **GRS-P**, **GRS-E** or, for example, **GRS-D-H-T**, depending on the ship's readiness for conversion to use gas fuel according to 14.2.2 of the above stated part.

**2.2.38 Distinguishing mark for ships which are periodically grounded in operation.**

If ships may lie aground in safety with partial or full hull baring in places fit for grounding the ships, and comply with the requirements of Section 15, Part XVII "Distinguishing Marks and Descriptive Notations in the Class Notation Specifying Structural and Operational Particulars of Ships", at the shipowner's discretion, one of the following distinguishing marks may be added to the character of classification of a ship:

**.1 NAABSA1** – partial or full ship underwater hull baring is permitted on plane homogeneous sand-and-shingle or sand-and-mud seabeds with no motion in calm water as harbours or sheltered areas;

**.2 NAABSA2** – in addition to **NAABSA1** distinguishing mark requirements specified above, motion and ship bow impact contact with seabed at defined wave parameters are permitted;

**.3 NAABSA3** – in addition to **NAABSA2** distinguishing mark requirements specified above, hull baring of moored ship is permitted at specified distance from seashore line in rolling conditions with impact contact against the seabed in any point of the hull bottom.

**2.2.39 Distinguishing mark for ships fitted with boiler plant monitoring system.**

If ships are fitted with boiler plant monitoring system that allows to carry out internal surveys of steam boilers without participation of the RS surveyor, and that complies with the requirements of Section 16, Part XVII "Distinguishing Marks and Descriptive Notations in the Class Notation Specifying Structural and Operational Particulars of Ships", at the shipowner's discretion, the distinguishing mark **BMS** (Boiler Monitoring System) may be added to the character of classification".

**2.2.40 Distinguishing mark for ships fitted with hull monitoring system.**

If ships are fitted with hull monitoring system complying with the requirements of Section 17, Part XVII "Distinguishing Marks and Descriptive Notations in the Class Notation Specifying Structural and Operational Particulars of Ships", at the shipowner's discretion, the distinguishing mark **HMS(...)** may be added to the character of classification. The symbols added in brackets specify completeness and features of the system.

**2.2.41 Indoor hygiene and sanitary conditions.**

If ships comply with the indoor climate requirements specified in Section 18 of Part XVII "Distinguishing Marks and Descriptive Notations in the Class Notation Specifying Structural and Operational Particulars of Ships", at the shipowner's discretion, the distinguishing mark **COMF(C)** may be added to the character of classification.

**2.2.42 Descriptive notation in the class notation.**

Ships complying with a definite scope of requirements of the RS rules taking account of their structural particulars and service conditions are assigned the appropriate descriptive notation added to the character of classification of a ship.

The current RS rules cover certain requirements the fulfilment of which makes possible introducing of the following descriptive notations in the class notation:

**Anchor handling vessel**  
**Bilge water removing ship**  
**Bulk carrier**  
**Cable laying barge**  
**Cable laying vessel**  
**Catamaran**  
**Container ship**  
**Crane vessel**  
**Docklift ship**  
**Dredger**  
**Escort tug**  
**Fishing vessel**  
**Floating crane**  
**Floating dock**  
**Gas carrier**  
**Hopper barge**  
**Hopper dredger**  
**Oil recovery ship**  
**Oil tanker**  
**Oil/bulk carrier**  
**Oil/bulk/ore carrier**  
**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**  
**Supply vessel (OS)**  
**Tanker**  
**Tanker (water)**  
**Tanker (wine)**  
**Timber carrier**  
**Tug, etc.**

*Note.* Descriptive notation in the class notation is written in English. At the discretion of the shipowner it may be written in two languages, English and Russian, for example: **Oil tanker (нефтеналивное) (ESP)**.

To the class notations of nuclear ships and floating facilities, nuclear support vessels, gas carriers, chemical tankers, high-speed craft, type A WIG craft, mobile offshore drilling units, manned submersibles and diving systems, sea-going pleasure craft, the distinguishing marks and descriptive notations shall be inserted in conformity with the provisions of rules for the classification and construction of the relevant types of ships (refer to 1.2.2).

The descriptive notation **Tanker** shall be accompanied by a cargo carried specification in brackets such as **Tanker (water)**, **Tanker (wine)**.

For ships of restricted area of navigation with the descriptive notation **Berth-connected ship** (refer to 2.2.5.1.6), the descriptive notation shall be supplemented by the statement of ship purpose out of those listed in the definition of the berth-connected ship (refer to 1.1.1).

If the scope of the RS rules requirements which a ship complies with allows, two and more descriptive notations may be stated in the class notation of a ship (e.g. **Supply vessel**, **Salvage ship**, **Tug**) or the descriptive notation may be written as compounds (e.g. **Oil/bulk carrier**, **Oil/bulk/ore carrier**).

If an oil tanker or oil recovery ship complies with the requirements for the ships, which carry petroleum products or recover them from the sea surface and carry them having flash point above 60 °C, this temperature shall be indicated in the descriptive notation. For example: **Oil tanker (> 60 °C)**, **Oil/ore carrier (> 60 °C)**, **Oil recovery ship (> 60 °C)**.

For oil tankers and bulk carriers fully complying with the requirements of Part XVIII "Common Structural Rules for Bulk Carriers and Oil Tankers", the distinguishing mark **CSR** shall be mandatory added after descriptive notation.

When adding the descriptive notation **Bulk carrier** to the character of classification, for bulk carriers of 150 m in length and upwards provided the appropriate requirements of 3.3, Part II "Hull" and those of Part XVIII "Common Structural Rules for Bulk Carriers and Oil Tankers" (as applicable) are complied with, one of the following distinguishing marks shall be added after the descriptive notation:

**.1 BC-A** — for ships designed to carry the bulk cargoes having a density of 1,0 t/m<sup>3</sup> and above with specified holds empty at the maximum draught;

**.2 BC-B** — for ships designed to carry the bulk cargoes having a density of 1,0 t/m<sup>3</sup> and above with all holds loaded;

**.3 BC-C** — for ships designed to carry the bulk cargoes having a density less than 1,0 t/m<sup>3</sup>.

For bulk carriers having one of the distinguishing marks **BC-A** or **BC-B** in the class notation, the detailed description of limitations to be observed during operation as a consequence of the design loading condition applied during the design (refer to 3.3, Part II "Hull" of these Rules or 3.2.1, Section 1, Chapter 1, Part 1 of the Common Structural Rules for Bulk Carriers and Oil Tankers<sup>1</sup> (Part XVIII of these Rules), as applicable) shall be provided in the following cases:

for distinguishing marks **BC-A** and **BC-B**, an entry (**maximum cargo density .... t/m<sup>3</sup>**) shall be made if the maximum cargo density is less than 3,0 t/m<sup>3</sup>;

for the distinguishing mark **BC-A**, the allowed combination of specified empty cargo holds shall be additionally entered, for example: (**cargo holds Nos. 2, 4, ... may be empty**);

for the distinguishing mark **BC-A**, if the ship is intended to operate in alternate block load condition, any two adjacent cargo holds shall be loaded with the next holds being empty, an entry (**block loading**) shall be made.

When the ship has not been designed for loading and unloading in multiple ports, an entry (**no MP**) shall be added after all the above distinguishing marks.

For bulk carriers having one of the distinguishing marks **BC-A** or **BC-B** in the class notation, and with cargo holds designed for loading/unloading by grabs in compliance with the requirements of Section 6, Chapter 1, Part 2 of the IACS Common Structural Rules (Part XVIII "Common Structural Rules for Bulk Carriers and Oil Tankers" of these Rules), the distinguishing mark **GRAB(X)** shall be mandatory added after the above distinguishing marks, where instead of **X** an unladen grab weight shall be indicated, taken not less than:

35 t for ships with  $L \geq 250$  m,

30 t for ships with  $200 \text{ m} \leq L < 250$  m,

20 t otherwise.

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

<sup>1</sup>Hereinafter referred to as "the IACS Common Structural Rules".



When adding descriptive notations to the character of classification of self-propelled ships such as **Chemical tanker, Oil tanker, Bulk carrier, Self-unloading bulk carrier, Ore carrier** or the word combinations: **Oil/bulk carrier, Oil/ore carrier** etc., after the descriptive notation it shall be added (**ESP**). This means the necessity to survey these ships based on the Enhanced Survey Programme. For example: **Oil/ore carrier (> 60 °C)(ESP)**.

For example: **Oil/ore carrier (> 60 °C) (ESP)**.

The descriptive notation **Escort tug** is added to the character of classification of tugs complying with the requirements of Section 2, Part XVII "Distinguishing Marks and Descriptive Notations in the Class Notation Specifying Structural and Operational Particulars of Ships".

For gas carriers engaged in transportation of liquefied natural gas (LNG) and intended to ensure the transfer of LNG on board the ships using LNG as a fuel (hereinafter referred to as "the LNG bunkering ships") in compliance with the requirements of Section 11, Part XVII "Distinguishing Marks and Descriptive Notations in the Class Notation Specifying Structural and Operational Particulars of Ships", the descriptive notation **LNG bunkering ship** is added to class notation after the descriptive notation **Gas carrier**.

When additional functions related to servicing of ships using LNG as a fuel are available on board and when the LNG bunkering ship meets the requirements specified in 11.13, Part XVII "Distinguishing Marks and Descriptive Notations in the Class Notation Specifying Structural and Operational Particulars of Ships", one of the following (or several) distinguishing marks shall be introduced in the class notation after descriptive notation **LNG bunkering ship: RE, IG-Supply, BOG**.

#### **2.2.43 Limitations on validity of some distinguishing marks.**

When particular scope of the RS rules requirements, serving as the basis for introduction of the appropriate distinguishing marks in the class notation, is met only under limitations specified by the Register, the limitations, exceeding which these distinguishing marks will become invalid, shall be indicated in the class notation in brackets after such distinguishing marks, e.g. **KM⊕Arc7 (hull at  $d \leq 8,4$  m; power) ⊕ (at  $d \leq 8,4$  m) AUT2 Ro-ro ship**.

At the shipowner's discretion, at the assignment of ice class limitation for ships, maximum draught in fresh water, at which the RS requirements for the specified ice class are complied with, can be additionally indicated, e.g. **Arc7 (hull at  $d/d_f \leq 11,0$  m/11,265 m; power)**, where  $d_f$  — maximum draught in fresh water at which the requirements for ice class are met and which is determined in accordance with 4.5.5 of the Load Line Rules for Sea-Going Ships.

## **2.3 ADDITIONAL CHARACTERISTICS**

**2.3.1** When complying with definite requirements of the RS 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 — by a roll-on/roll-off; the ship is suitable for operation in waters covered with oil, etc. (refer also to 1.1.4.8, 1.1.5.1, 1.1.5.2 and 3.3.1.5, Part II "Hull" of these Rules).

**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, pipe-laying 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 of Supply Vessel (OS)".

## **2.4 ALTERATION OF MARKS IN CLASS NOTATION**

**2.4.1** The Register may delete or alter any mark in the class notation in the case of any alteration of, or non-compliance with the requirements defining the insertion of this mark in the class notation.

### **3 TECHNICAL DOCUMENTATION**

#### **3.1 GENERAL**

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

**3.1.2** Prior to the commencement of a ship construction, technical documentation proving that all requirements of the Register applicable to the ship concerned are complied with, shall be submitted to the Register for review. The documentation for review shall be submitted to the Register in electronic form in PDF format.

Basically two practical alternatives of documentation submission and approval are allowed:

**.1** submission of plan approval documentation in a scope specified in 3.2 taking into account the peculiarities and type of a ship without further approval of detailed design documentation;

**.2** submission of technical design documentation in a scope specified in 3.3 taking into account the peculiarities and type of a ship with further approval of detailed design documentation.

In such case, the technical design documentation approved by the Register does not constitute grounds for assignment of class to the ship. This documentation is considered by the Register exclusively as the basis for further design.

**3.1.3** When the earlier approved documentation is used for construction of a similar ship according to a new contract for construction, the scope of documentation to be submitted may be reduced based on the RS analysis of compliance with the requirements of the RS normative documents that came into force on or after the date of signing of the previous contract for construction for which the documentation was approved.

**3.1.4** In the lists specified in 3.2, 3.3 and 3.4, documentation marked with (\*) is the documentation which review results are documented by stamping in accordance with 8.3.1, Part II "Technical Documentation" of the Rules for Technical Supervision during Construction of Ships and Manufacture of Materials and Products for Ships.

Documentation marked with (\*\*\*) is the documentation which review results are documented by stamping in accordance with 8.3.2, Part II "Technical Documentation" of the Rules for Technical Supervision during Construction of Ships and Manufacture of Materials and Products for Ships.

**3.1.5** 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 Part I "General Provisions" of the Rules for the Classification Surveys of Ships in Service.

At the same time, technical documentation for conversion of 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) set out in the Supplement to rules of Russian Maritime Register of Shipping "IACS Procedural Requirements, Unified Interpretations and Recommendations" (published in electronic form as a separate edition).

**3.1.6** Requirements for the scope of technical documentation of materials and products for ships are given in the relevant parts of these Rules.

**3.1.7** When alternative design and arrangements being applied on board, deviate from the classification requirements of the RS 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 RS requirements.

During the review of alternative design and arrangements under SOLAS Convention (IMO resolution MSC.216(82)), one should be guided by the provisions of regulations II-1/55, II-2/17 and III/38 of SOLAS 74 with regard to IMO circulars MSC.1/Circ.1002 and MSC.1/Circ.1212.

### 3.2 PLAN APPROVAL DOCUMENTATION

#### 3.2.1 General:

- .1 ship specification (to be submitted for information);
- .2 general arrangement plan (to be submitted for information);
- .3 list of components and materials with indication of the Register approval (\*\*);
- .4 drawing of dangerous zones and spaces (only for oil tankers and oil recovery ships) (\*);
- .5 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 all passenger ships of 100 gross tonnage and above and for all cargo ships of 300 gross tonnage and above) (\*);
- .6 list of deviations from the RS rules with references to the relevant RS letters of their approval (refer to 1.3.4 of the General Regulations for the Classification and Other Activity) — if any (\*\*);
- .7 an engineering analysis of the alternative design and arrangements — if any (\*\*);
- .8 report on qualitative failure analysis for propulsion and steering in compliance with Section 11, Part VII "Machinery Installations" (for passenger ships) (\*\*);
- .9 engineering analysis of the capability of a ship to return to port in case of an accident in accordance with 2.2.6 and 2.2.7, Part VI "Fire Protection", considering interpretations of IMO circular MSC.1/Circ.1369 (for passenger ships having length of 120 m and above or having three or more main vertical zones) (\*\*);
- .10 list of structural measures and engineering solutions ensuring electrostatic and galvanic intrinsic safety (\*\*).

#### 3.2.2 Hull documentation:

- .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<sup>1</sup> (\*\*);
- .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 and values of design still water bending moments<sup>1, 2</sup> (\*);
- .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<sup>1, 2</sup> (\*);
- .4 deck and platform plans with indication of design loads (including the loads induced by lift trucks and containers), positions and dimensions of openings, their strengthening, end structures of the side coamings<sup>2</sup> (\*);
- .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<sup>2</sup> (\*);
- .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<sup>1, 2</sup> (\*);
- .7 drawings of longitudinal and transverse bulkheads, including tank wash bulkheads (for tanks the heights of overflow and air pipes shall be indicated)<sup>2</sup> (\*);
- .8 drawing of the after end framing and sternframe<sup>2</sup> (\*);
- .9 drawing of the fore end framing and stem<sup>2</sup> (\*);

<sup>1</sup>Documentation shall be submitted together with the first portion of the documentation on hull.

<sup>2</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.

- .10 drawings of propeller shaft brackets and bossings as well as fixed nozzles<sup>1</sup> (\*);
  - .11 drawings of seatings for the main machinery, boilers and shaft bearings, including bottom construction with indication of type and power of the machinery, as well as with indication that seatings comply with the requirements of the supplier's technical documentation on the main machinery and boilers or that no special requirements are placed by the supplier on the seatings<sup>1</sup> (\*);
  - .12 drawings of seatings for auxiliary machinery, equipment and gears according to 2.11, Part II "Hull"<sup>1</sup> (\*) (shall be reviewed by the RS Branch Office carrying out technical supervision during construction at delivery and installation stages);
  - .13 drawings of engine and boiler casings, coamings, companions and other guards of openings in the ship's hull<sup>2</sup> (\*);
  - .14 drawing of superstructures and deckhouses<sup>1</sup> (\*);
  - .15 drawings of bulwark<sup>1</sup> (\*);
  - .16 strength calculations of seatings for mooring and towing appliances (\*\*);
  - .17 drawings of seatings for mooring and towing equipment with indication that seatings comply with the requirements of the supplier's technical documentation on the equipment or that no special requirements are placed by the supplier on the seatings<sup>1</sup> (\*);
  - .18 plan of weld control and table of hull welding (\*), containing the following information:
    - .18.1 name and thickness of structural components to be joined;
    - .18.2 shape or symbol of edge preparation;
    - .18.3 brands and grades of base metal;
    - .18.4 brands and grades of welding consumables;
    - .18.5 method of welding and position of joint in space<sup>2</sup>;
  - .19 plan of testing the hull for watertightness<sup>3</sup> (\*);
  - .20 hull typical structural details (\*) (shall be reviewed by the RS Branch Office carrying out technical supervision during construction);
  - .21 specifications of protective coatings according to 6.5, Part XIII "Materials" (\*);
  - .22 basic parameters of the hull protection by damping from damages when mooring (for ships to be moored at sea to other ships) (\*\*);
  - .23 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 (\*);
  - .24 Loading Manual for ships of 65 m and over in length (refer to 1.4.9, Part II "Hull") (\*).
- 3.2.3 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 (\*);
  - .4 strength calculation of essential parts and assemblies of rudder and steering gear (\*\*);
  - .5 calculation of efficiency of rudder and steering gear (\*\*);
  - .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 and towing arrangements (\*\*);
  - .9 arrangement plans with essential parts and assemblies of anchor, mooring and towing arrangements (\*);
  - .10 calculations of signal masts and rigging (\*\*);
  - .11 drawings of signal masts and rigging (\*);

<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.

<sup>2</sup>If the information indicated in 3.2.2.18.1 — 3.2.2.18.5 is stated to the full in the drawings of a ship's hull, then submission of the table of welding is not required.

<sup>3</sup>It can be merged with plan of subdivision according to 3.2.5.3.

- .12 arrangement plans with essential parts and assemblies of guard rails (\*);
- .13 calculations of essential parts and assemblies of guide members for containers in cargo holds (\*\*);
- .14 arrangement plans of essential parts and assemblies of guide members for containers in cargo holds (\*);
- .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<sup>1</sup> (\*);
- .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 and bulk carriers (\*);
- .19 means of access manual (for oil tankers and bulk carriers) (\*);
- .20 calculation of hoisting gear of shipborne barges (\*\*);
- .21 general view of hoisting gear of shipborne barges (\*);
- .22 list of emergency outfit (\*\*).

**3.2.4 Documentation on stability and manoeuvrability:**

- .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. (\*\*);

- .7 summary table of the results of stability verification according to these Rules and curves of static or dynamic stability (\*\*);

- .8 stability calculations for the case of loading and stowage of bulk cargoes other than grain (\*\*);

- .9 freeboard plan (\*\*), containing:

information about maximum draught of the ship;

general arrangement plan of openings and closing appliances, which contribute to the watertight integrity of the ship external boundaries (external doors, cargo hatches, service hatches; bow, stern and side doors and ramps; scuttles and windows, freeing ports and scuppers, bottom and side valves of sea water systems, sewage system etc.; air pipes and ventilation heads, closures of ventilation ducts, engine room skylights, etc.);

arrangement plan of means for protection of the crew (bulwark, guard rails, gangways, passageways, etc.).

**3.2.5 Documentation on subdivision:**

- .1 calculations on probability estimation of subdivision (if required) (\*\*);
- .2 calculations of damage trim and stability, including static stability curves (\*\*);
- .3 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 (\*\*);
- .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 arrangement plan of the flooding detection sensors of water ingress into compartments of passenger ships, bulk carriers or single-hold cargo ships below 100 m in length, as specified in Part V "Subdivision".

<sup>1</sup>If all necessary information concerning escape routes is stated in the general arrangement plan, plan of escape routes is not required. In this case the arrangement plan shall be approved (\*).

The arrangement plan, as a minimum, shall include the following:  
technical description of the flooding detection system equipment (\*\*);  
Type Approval Certificate for the flooding detection system (\*);  
single-line diagrams of the flooding detection system with indication of equipment location in the ship general arrangement plan (\*);  
documents with indication of location, fastening, protection and test procedures for the flooding detection system equipment (\*);  
description of procedures necessary to be performed in case of the flooding detection system failure (\*\*);  
requirements for the flooding detection system equipment maintenance (\*\*).

**3.2.6 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 2.2.1.3, 2.2.1.5, 2.3.3 or 2.4.2, Part VI "Fire Protection" (\*);

.1.2 schemes or description of insulation, lining, finishing, deck covering and other finishing materials (\*);

.1.3 calculations required by 2.1.1.4 and 2.1.1.10, Part VI "Fire Protection" (\*\*);

.2 diagrams of fire extinguishing systems and smoke detection system by air sampling with associated calculations and other data, which confirm the fulfillment of the requirements of Part VI "Fire Protection" (\*);

.3 list of fire-fighting outfit (\*\*);

.4 structural drawings of assemblies and parts of fire-fighting divisions (\*);

.5 structural drawings of insulation, lining and deck covering (\*);

.6 arrangement plan of fire-fighting outfit (\*);

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

.8 preliminary fire plan (\*\*);

.9 calculations of fire extinguishing systems (\*\*);

.10 structural drawings of assemblies and equipment of fire extinguishing systems (\*);

.11 diagrams and operational manuals for fire extinguishing systems, which shall be available on board the ship in accordance with Part VI "Fire Protection" (\*\*).

*Note.* When equipment of carbon dioxide smothering systems, aerosol fire extinguishing systems, fixed local application fire extinguishing systems are supplied as complete delivery, appropriate diagrams and calculations as required by 3.2.6.2, 3.2.6.9 and 3.2.6.10 for the mentioned systems may be submitted together with the documentation required by Section 4, 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;

.12 electrochemical protection scheme in oil tankers (\*).

**3.2.7 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") with indication of 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 Section 12, 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;

.4 drawings of arrangement and outfitting in fuel oil and lubricating oil tanks (\*);

.5 documentation on shafting<sup>1</sup>:

.5.1 general view of shafting (\*\*);

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<sup>1</sup>The documentation shall contain information on treatment and geometry of working surfaces, heat treatment, tolerances on mating parts, hydraulic tests, non-destructive testing, etc.

- .5.2 drawing of sterntube and parts of sterntube arrangement, drawing of casing protecting the area between the sterntube and propeller boss (\*);
- .5.3 sterntube bearing and sterntube seal lubrication and cooling diagrams (\*);
- .5.4 drawings of shafts (propeller, intermediate and thrust) (\*);
- .5.5 drawings of shaft connections and couplings (\*);
- .5.6 drawings of journal and thrust bearings of shafting and their fastening to the seatings (\*);
- .5.7 strength calculation of shafts and their fastening parts (\*\*);
- .5.8 calculation of the number of shaft supports, their position and loads carried (\*\*);
- .5.9 calculation of parameters of shafting alignment (\*\*);
- .5.10 calculation of fitting of propeller and shafting couplings (\*\*);
- .5.11 torsional vibration calculations in compliance with the requirements of Section 8, Part VII "Machinery Installations". In some cases, calculation of axial and bending vibration of shafting may be required (\*\*).

Note. When controllable pitch propeller is supplied as complete delivery with the propulsion plant, the documentation listed in 3.2.7.5.2 — 3.2.7.5.11 may be submitted together with the documentation required by Section 6, 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;

- .5.12 calculation of power of the main machinery for **Ice2** to **Arc9** ice class ships in compliance with the requirements of 2.1, Part VII "Machinery Installations" to the minimum value of power delivered to the propeller shafts of the ships (\*\*);
- .6 documentation on propeller<sup>1, 2</sup>;
- .6.1 general view of propeller (\*\*);
- .6.2 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 mentioned calculations 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;

- .6.3 drawings of blade, boss and cone, as well as items for their securing (for detachable-blade propeller and CP-propeller) (\*);
- .6.4 drawing of propeller attachment to propeller shaft (\*);
- .6.5 description of pitch actuating mechanism (PAM) and its control system (\*\*);
- .6.6 diagrams of pitch actuating mechanism (PAM) (\*);
- .6.7 pitch control unit as assembled (\*\*);
- .6.8 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 (\*).

Note. The documentation listed in 3.2.7.6.3 — 3.2.7.6.8 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;

- .7 documentation on active means of the ship's steering (AMSS)<sup>1, 2</sup>;
- .7.1 drawings of AMSS installation and securin (\*);
- .7.2 data to confirm compliance of the AMSS construction with operational conditions (\*\*);
- .7.3 general view with necessary sections and sealing details (\*\*);
- .7.4 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 3.2.7.6) (\*);
- .7.5 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 3.2.7.6) (\*);

<sup>1</sup>The documentation shall contain information on treatment and geometry of working surfaces, heat treatment, tolerances on mating parts, hydraulic tests, non-destructive testing, etc.

<sup>2</sup>For propellers not covered by the requirements of these Rules, the drawing list shall be agreed with the Register in each particular case.



- .7.6 strength calculations of the input drive shaft of rotor, blade, gearing of vertical-axis propellers (\*\*);
  - .7.7 drawings of shafts, gearing, rotors, blades and pitch control gear of vertical-axis propellers (\*);
  - .7.8 drawings of bearings and seals (\*);
  - .7.9 calculation of connections, drawings of propeller nozzles and tunnels, including information on acceptable clearance between ready-fitted propeller and tunnel (nozzle) (\*\*);
  - .7.10 hull member drawings and drawings of reversible-steering gear of water-jets (\*);
  - .7.11 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 (\*);
  - .7.12 calculations of electric drives for electrically driven AMSS (\*\*);
  - .7.13 diagrams of electric drives for electrically driven AMSS (\*);
  - .7.14 documentation on monitoring, control, and protection systems (\*);
  - .7.15 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 (\*\*);
- .7.16 AMSS specification, containing its principal characteristics, as well as material specifications for principal parts and assemblies (\*\*);
  - .7.17 prototype and pilot specimen test programme (\*);
  - .7.18 description, service and maintenance manual (\*\*).

Note. The documentation listed in 3.2.7.7.3 — 3.2.7.7.18 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 documentation on refrigerating plants (refer to 4.3).

### **3.2.8 Documentation on automation equipment:**

#### **3.2.8.1 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 failure mode and effects analysis (FMEA) for dynamic positioning systems on the ships having distinguishing mark **DYNPOS-2** or **DYNPOS-3** in the class notation (\*\*);
- .6 diagrams of power supply for automation systems listed in 3.2.8.2.1 — 3.2.8.2.7 (\*).

#### **3.2.8.2 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 3.2.8.2.1 — 3.2.8.2.7, 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 (\*).

Note: Technical documentation listed in 3.2.8.2 shall be submitted by the designer or system integrator specified in 3.2.8.1.1. In the latter case, the documentation shall be developed taking into account the solutions adopted in technical documentation listed in 3.2.8.1, and submitted for approval at the stage of delivery and installation to the RS Branch Office responsible for carrying out technical supervision during construction, together with the documentation according to 1.4.1 of Part XV "Automation" of these Rules, approved under technical supervision of automation equipment as required by Section 12 of 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.

### **3.2.9 Documentation on systems and piping:**

- .1 documentation on ship's systems:
  - .1.1 bilge system diagram (\*);
  - .1.2 ballast system diagram (\*);
  - .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 (\*);
  - .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, as stated in 4.3.2.4 and 4.3.2.6, Part VIII "Systems and Piping" (\*);
  - .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 calculations of the systems: bilge, ballast, vapour emission control; ventilation of battery rooms, cargo pump rooms, enclosed spaces and holds intended for the carriage of motor vehicles (\*\*);
  - .1.12 diagram of thermal liquid system (\*);
  - .1.13 diagram of fuel oil loading, transfer, storage and helicopter refuelling system, diagram of off-grade aviation fuel collection, storage and defueling 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 (\*);
  - .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 (\*) (may be submitted together with the documentation required by Section 8, 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);
- .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 3.2.9.1 and 3.2.9.2.

**3.2.10 Documentation on electrical equipment:**

- .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 providing for the operating conditions specified in 3.1.5, Part XI "Electrical Equipment", 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 calculation results of cross-sections of cables with indication of their types, currents and protection (\*\*);
- .5 detailed diagrams of the main current, excitation, control, pilot, signalling, protection and interlocking of the electric propulsion plant (\*);
- .6 calculation results of necessary power output of the propulsion generators to ensure normal operation under all operating conditions (\*\*);
- .7 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 (\*\*);
- .8 calculation results of illumination intensity for areas and spaces (\*\*);
- .9 diagrams of internal communication and signalling according to Section 7, Part XI "Electrical Equipment" (\*);
- .10 diagrams of essential electric drives (according to 1.3.2.1 and 1.3.2.2, Part XI "Electrical Equipment" (\*);
- .11 diagrams of lubrication systems for electrical machines and air cooling systems for the main electrical machines (\*);
- .12 diagrams of the protective and lightning protection earthing (\*);
- .13 arrangement diagrams 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" (\*);
- .14 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 (\*\*);
- .15 calculation results of the prospective voltage curve harmonic distortion factors for different parts of the ship's 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 (\*\*);
- .16 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 (\*\*);

- .17 diagram and drawing of disconnection and blocking system of electrical equipment, which is not used in the oil recovery ship operations on elimination of oil spillage (\*);
- .18 instructions on preparation and application of electrical equipment of oil recovery ship for elimination of oil spillage. It is to determine the procedure of compulsory disconnection of power consumers having no certificates on explosion proof enclosure (\*\*);
- .20 documentation on fixed and portable devices for measuring and signalling of explosive concentrations of gases (\*);
- .21 calculation of voltage drop when a consumer with the maximum starting power is switched on (\*\*);
- .22 list of measures to ensure the electromagnetic compatibility of a ship equipment (\*\*);
- .23 failure mode and effects analysis (FMEA) for all electric and hydraulic components of the podded drive used as the rudder and steering gear (\*\*);
- .24 diagrams of electric connections (for systems and equipment specified in 3.2.10.1, 3.2.10.2, 3.2.10.5, 3.2.10.9, 3.2.10.10, 4.3.1.1.12) with indication of cable types and places of installation of all elements of the diagrams (\*);
- .25 drawings of cable runs and their penetrations through watertight, gastight and fire-fighting divisions with indication of measures taken to suppress radio interferences (\*);
- .26 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) (\*);
- .27 drawings of layout and installation of essential electrical equipment (\*);
- .28 assembly drawings (only for non-standard products) of the main and emergency switchboards, electric propulsion plant switchboards, control stations and panels, special switchboards, power and lighting switchboards (\*);
- .29 diagrams and installation and layout drawings of electrical apparatus and facilities for measuring non-electric values (level, pressure, temperature gauges, etc.) (\*);
- .30 technical background containing substantiation of distinguishing mark **EPP** (if applicable) in class notation (\*\*);
- .31 shipyard/industry standards on wiring works confirming compliance with the requirements of the RS rules (\*\*);
- .32 where refrigerating plants shall be classified, documentation stated in 3.2.10.1 — 3.2.10.31 shall contain the data concerning electrical equipment of refrigerating plant.

### 3.3 TECHNICAL DESIGN DOCUMENTATION

#### 3.3.1 General:

- .1 ship specification (to be submitted for information);
- .2 general arrangement plan (to be submitted for information);
- .3 drawing of dangerous zones and spaces (\*);
- .4 list of deviations from the RS rules with references to the appropriate RS letters of their approval (refer to 1.3.4 of the General Regulations for the Classification and Other Activity), if any (\*\*);
- .5 engineering analysis of alternative design and arrangements (refer to 3.1.5), if any (\*\*);
- .6 report on qualitative failure analysis for propulsion and steering in accordance with Section 11, Part VII "Machinery Installations" (for passenger ships) (\*\*);
- .7 engineering analysis of the capability of a ship to return to port in case of an accident in accordance with 2.2.6 and 2.2.7, Part VI "Fire Protection", considering interpretations of IMO circular MSC.1/Circ.1369 (for passenger ships having length of 120 m and above or having three or more main vertical zones) (\*\*).

#### 3.3.2 Hull documentation:

- .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 (\*\*);

.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 and values of design still water bending moments<sup>1</sup> (\*);

.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<sup>1</sup> (\*);

.4 deck and platform plans with indication of design loads (including the loads induced by lift trucks and containers), positions and dimensions of openings, their strengthening, end structures of the side coamings<sup>1</sup> (\*);

.5 double bottom (single bottom) plan.

The plan shall contain: sea chest sections with indication of pressure in the blow-down system; boundaries of watertight compartments; table of pressure heads.

For bulk carriers and ore carriers an allowable load on the inner bottom plating shall be indicated<sup>1</sup> (\*);

.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<sup>1</sup> (\*);

.7 drawings of longitudinal and transverse bulkheads, including tank wash bulkheads (for tanks the heights of overflow and air pipes shall be indicated)<sup>1</sup> (\*);

.8 drawing of the after end framing and sternframe<sup>1</sup> (\*);

.9 drawing of the fore end framing and stem<sup>1</sup> (\*);

.10 drawings of propeller shaft brackets and bossings as well as fixed nozzles<sup>1</sup> (\*);

.11 drawings of engine and boiler casings, coamings, companions and other guards of openings in the ship's hull<sup>1</sup> (\*);

.12 drawing of superstructures and deckhouses<sup>1</sup> (\*);

.13 drawings of bulwark<sup>1</sup> (\*);

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

.15 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 (\*).

### 3.3.3 Documentation on arrangements, equipment and outfit:

.1 arrangement plan 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 (\*);

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

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

.6 arrangement plan of hatch covers of cargo holds (\*);

.7 strength calculations of hatch covers of cargo holds (\*\*);

.8 calculations of anchor, mooring and towing arrangements (\*\*);

.9 arrangement plans of anchor, mooring and towing arrangements (\*);

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

.11 drawings of signal masts and 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 (\*);

.15 arrangement plan of catwalk on oil tankers (\*);

<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 welds.

.16 plan of escape routes<sup>1</sup> (\*);  
.17 arrangement plans of means of access for inspections of cargo and other spaces on oil tankers and bulk carriers (\*);

.18 calculation of hoisting gear of shipborne barges (\*\*)

.19 general view of hoisting gear of shipborne barges (\*).

**3.3.4 Documentation on stability and manoeuvrability:**

.1 lines drawing, coordinate tables of lines (\*\*);

.2 corner point coordinate table for compartments and tanks (\*\*);

.3 table of hydrostatic particulars (\*\*);

.4 table of cross-curves of stability including drawing of the buoyant hull (\*\*);

.5 calculation of a ship's stability according to the RS rules including mass tables for various loading conditions, verification of stability criteria, static stability curves, diagrams of windage area and calculations of icing, calculations of heel caused by crowding of passengers and by turning, corrections for free surface effect of liquid cargoes and stores, a curve of angles of flooding, etc. (\*\*);

.6 freeboard plan containing: information about maximum draught of the ship; general arrangement plan of openings and closing appliances, which contribute to the watertight integrity of the ship external boundaries (external doors, cargo hatches, service hatches; bow, stern and side doors and ramps; scuttles and windows, freeing ports and scuppers, bottom and side valves of sea water systems, sewage system, etc.; air pipes and ventilation heads, closures of ventilation ducts, engine room skylights, etc.) (\*\*).

**3.3.5 Documentation on subdivision:**

.1 calculations on probability estimation of subdivision (if required) (\*\*);

.2 calculations of damage trim and stability, including static stability curves (if required) (\*\*);

.3 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 (\*\*);

.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 arrangement plan of the flooding detection sensors of water ingress into compartments of passenger ships, bulk carriers or single-hold cargo ships below 100 m in length, as specified in Part V "Subdivision" (\*\*);

.7 freeboard calculation and drawings of the load line mark (\*\*).

**3.3.6 Documentation on fire protection:**

.1 documents on structural fire protection:

.1.1 arrangement plan of fire-fighting divisions, including doors and penetrations (cutouts) in these structures with indication of categories of these spaces in accordance with 2.2.1.3, 2.2.1.5, 2.3.3 or 2.4.2, Part VI "Fire Protection" (\*);

.1.2 schemes or description of insulation, lining, finishing, deck covering and other finishing materials (\*);

.1.3 calculations required by 2.1.1.4 and 2.1.1.10, Part VI "Fire Protection" (\*\*);

.2 diagrams of fire extinguishing systems and smoke detection system by air sampling (\*) with associated calculations and other data, which confirm the fulfillment of the requirements of Part VI "Fire Protection" (\*\*);

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

**3.3.7 Documentation on machinery and boiler plant:**

.1 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") with indication of escape routes (\*);

.2 diagram (\*) and description (\*\*) of the remote control of 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;

<sup>1</sup>If all necessary information concerning escape routes is stated in the general arrangement plan, plan of escape routes is not required. In such a case, the general arrangement plan (\*) is approved.

- .3 documentation on shafting:
  - .3.1 general view of shafting (\*);
  - .3.2 drawing of sterntube and parts of sterntube arrangement (\*);
  - .3.3 drawings of shafts (propeller, intermediate and thrust) (\*);
  - .3.4 drawings of shaft connections and couplings (\*);
  - .3.5 drawings of journal and thrust bearings of shafting and their fastening to the seatings (\*);
  - .3.6 strength calculation of shafts and their fastening parts (\*\*);
  - .3.7 calculation of the number of shaft supports, their position and the loads carried (\*\*);
  - .3.8 calculation of fitting of propeller and shafting couplings (\*\*);
  - .3.9 torsional vibration calculations in compliance with the requirements of Section 8, Part VII "Machinery Installations". In some cases, calculation of axial vibration may be required (\*\*);
  - .3.10 sterntube bearing and sterntube seal lubrication and cooling diagrams (\*);
  - .3.11 calculation of bending vibration of shafting in compliance with the requirements of Section 5, Part VII "Machinery Installations" (\*\*);
- .4 documentation on propeller:
  - .4.1 general view of propeller (\*);
  - .4.2 drawings of blade, boss as well as items for their securing (for detachable-blade propeller and CP-propeller) (\*);
  - .4.5 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 (\*\*);
- .5 documentation on active means of the ship's steering (AMSS):
  - .5.1 drawings of AMSS installation and securing;
  - .5.2 data to confirm compliance of the AMSS construction with operational conditions;
  - .5.3 calculation of loads acting on AMSS and its basic elements (\*\*).
- 3.3.8 Documentation on automation equipment:**
  - .1 technical description of automation systems and devices with indication of their purpose and principle of operation (\*\*);
  - .2 functional diagrams of alarm and monitoring systems (AMS), centralized monitoring systems, computer-based and integrated control systems and AMS, including diagrams of power supply (\*);
  - .3 list of controlled parameters with indication of types of devices (\*);
  - .4 technical documentation on remote automated control for main engines and CP-propellers: functional diagrams, control console panels with indication of all devices, diagram of power supply of remote automated control (\*);
  - .5 technical documentation on automation of auxiliary engines and electric power plants: functional diagrams, control console panels for electric power plant with indication of all devices (\*);
  - .6 technical documentation on automation of boiler plant: functional diagrams, control console panels with indication of all devices (\*);
  - .7 functional diagrams of automation of compressor plants (\*);
  - .8 functional diagrams of automation and remote control of bilge and ballast systems (\*);
  - .9 functional diagrams of remote level indicating systems (\*);
  - .10 general arrangement plans of automation equipment at the engine control room and on the navigation bridge (\*);
  - .11 failure mode and effects analysis (FMEA) for dynamic positioning systems on the ships having distinguishing marks **DYNPOS-2**, **DYNPOS-3** in the class notation (\*\*);
  - .12 technical background containing substantiation of distinguishing automation mark in class notation of the ship (\*\*).
- 3.3.9 Documentation on systems and piping:**
  - .1 documentation on ship's systems:
    - .1.1 bilge system diagram (\*);
    - .1.2 ballast system diagram (\*);

.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 (\*);

.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 system, as well as scuppers with indication of watertight bulkheads, freeboard deck and distances from waterline or freeboard deck to the relevant discharges, as stated in 4.3.2.4 and 4.3.2.6, Part VIII "Systems and Piping"(\*);

.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 calculations of the systems: bilge, ballast, vapour emission control; ventilation of battery rooms, cargo pump rooms, enclosed spaces and holds intended for the carriage of motor vehicles (\*\*);

.1.12 diagram of thermal liquid 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 (\*);

.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 (\*\*);

.3 drawings of air pipes and ventilator pipes on open deck spaces (\*);

.4 data on pipe dimensions (diameter and wall thickness) as well as data on material of pipes used, material of gaskets and types of pipe connections shall be contained in documentation listed in 3.3.9.1 and 3.3.9.2.

### **3.3.10 Documentation on electrical equipment:**

.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 providing for the operating conditions specified in 3.1.5, Part XI "Electrical Equipment", 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 calculation results of cross-sections of cables with indication of their types, currents and protection (\*\*);

.5 circuit diagrams of the main current, excitation, control, signalling, protection and interlocking of the electric propulsion plant (\*);

.6 calculation results of necessary power output of the propulsion generators to ensure normal operation under all operating conditions (\*\*);

.7 results of short-circuit current calculation 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 (\*\*);

.8 calculation results of illumination intensity for areas and spaces (\*\*);



- .9 diagrams of internal communication and signalling according to Section 7, Part XI "Electrical Equipment" (\*);
- .10 circuit diagrams of essential electric drives (according to 1.3.2.1 and 1.3.2.2, Part XI "Electrical Equipment") (\*);
- .11 diagrams of lubrication systems for electrical machines and air cooling systems for the main electrical machines (\*);
- .12 diagrams of the protective and lightning protection earthing (\*);
- .13 arrangement diagrams 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") (\*);
- .14 capacity calculation results for accumulator batteries of emergency lighting, navigation lights, general alarm system, fire alarm system and fire smothering appliances, stating arrangements for emergency diesel generators (\*\*);
- .15 results of calculation of the prospective voltage curve harmonic distortion factors for different parts of the ship's mains when using power semiconductor units, as well as results of calculation of harmonic distortions following the harmonic filters failure if installed in the ship's electrical distribution system (\*\*);
- .16 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 consumers to be disconnected in every step (\*\*);
- .17 diagram and drawing of disconnection and blocking system of electrical equipment, which is not used in the oil recovery ship operations on elimination of oil spillage (\*);
- .18 list of electrical equipment installed in dangerous zones, containing information on spaces and areas where it is installed with indication of zones according to 19.2.3.1, Part XI "Electrical Equipment", and information on this equipment with indication of type of protection (\*\*);
- .19 calculation of voltage drops 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 failure mode and effects analysis (FMEA) for all electric and hydraulic components of the podded drive used as the rudder and steering gear (\*\*);
- .22 technical background containing substantiation of distinguishing mark **EPP** (if applicable) in class notation (\*\*).

### **3.4 DETAILED DESIGN DOCUMENTATION FOR A SHIP UNDER CONSTRUCTION**

#### **3.4.1 Hull documentation:**

- .1 drawings of stem and sternframe (\*);
- .2 drawings of sections and assemblies of the main hull including decks, transverse and longitudinal bulkheads, sides, bottom, double bottom (with table of positions of manholes and other openings), integral tanks outside double bottom, etc. (\*);
- .3 drawings of sections and assemblies of superstructures and deckhouses (\*);
- .4 drawings of engine and boiler casings, coamings, companions and other guards of openings in the ship's hull (\*);
- .5 drawings of propeller shaft tunnel, recesses, emergency escape trunks (\*);
- .6 drawings of propeller shaft brackets and bossings (\*);
- .7 drawings of seatings for the main machinery, boilers and shaft bearings, auxiliary machinery, equipment and gears included in the Nomenclature of Items of the Register Technical Supervision (\*);
- .8 bulwark drawings (\*);
- .9 plan of testing the hull for watertightness (\*);
- .10 plan of weld control and table of hull and superstructure welding containing the information given in 3.2.3.18 (\*);

- .11 hull blocks plan (\*\*);
- .12 description of process of hull parts mating afloat developed based on the Register recognized methods of similar work (\*\*);
- .13 hull painting list (\*\*);
- .14 Loading Manual for ships of 65 m and over in length (refer to 1.4.9, Part II "Hull") (\*\*);
- .15 booklet on stability and strength for loading, unloading and stowage of bulk cargoes other than grain (refer to 1.4.9.7, Part II "Hull") (\*\*).

**3.4.2 Documentation on arrangements, equipment and outfit:**

- .1 general view of assemblies and parts of closing appliances of openings in hull, superstructures, deckhouses and subdivision bulkheads (\*);
- .2 general view of assemblies and parts of rudder and steering gear, active means of the ship's steering, anchor, mooring and towing arrangements, spar and rigging, guard rails (\*);
- .3 general view of assemblies and parts of appliances for bulk cargo separation (\*);
- .4 plans of arrangement and fastening of ladders with essential parts and assemblies (including accommodation and pilot ladders, and companion ladders) (\*);
- .5 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 all passenger ships of 100 gross tonnage and above and for all cargo ships of 300 gross tonnage and above) (\*).

**3.4.3 Documentation on stability:**

- .1 preliminary Stability Booklet and supporting calculation data (\*\*).

**3.4.4 Documentation on subdivision:**

- .1 preliminary Damage Stability Booklet and supporting calculation data (\*\*);
- .2 documentation on installation of flooding detection sensors of water ingress into compartments of passenger ships, bulk carriers or single-hold cargo ships below 100 m in length, as specified in Part V "Subdivision" (\*\*) including:
  - .2.1 technical description of the flooding detection system equipment (\*\*);
  - .2.2 Type Approval Certificate for the flooding detection system (\*);
  - .2.3 single-line diagrams of the flooding detection system with indication of equipment location in the ship general arrangement plan (\*);
  - .2.4 documents with indication of location, fastening, protection and test procedures for the flooding detection system equipment (\*);
  - .2.5 description of procedures necessary to be performed in case of the flooding detection system failure (\*\*);
  - .2.6 requirements for the flooding detection system equipment maintenance (\*\*).

**3.4.5 Documentation on fire protection:**

- .1 structural drawings of assemblies and parts of fire-fighting divisions (\*);
- .2 structural drawings of insulation, lining and deck covering (\*);
- .3 structural drawings of assemblies and equipment of fire extinguishing systems (\*) with necessary calculations (\*\*);
- .4 arrangement plan of fire-fighting outfit (\*);
- .5 list of spare parts and tools (\*\*);
- .6 operational diagrams (\*) and manuals (\*\*) for fire extinguishing systems, which shall be available on board the ship in accordance with Part VI "Fire Protection";
- .7 fire plan in accordance with 1.4, Part VI "Fire Protection" (\*) (the stamp of approval is put upon completion of ship construction).

**3.4.6 Documentation on systems and piping:**

- .1 drawings of ship's systems:
  - .1.1 bilge system (\*);
  - .1.2 ballast system (\*);
  - .1.3 heel and trim system, including design of devices (automatically and manually controlled) for ship equalization by cross-flooding (\*);

.1.4 air, overflow, sounding pipes, liquid level indicators, remote level gauging system in fuel oil tanks, cargo and slop tanks of oil tankers (\*);

.1.5 ventilation systems of accommodation, service, cargo, machinery and production spaces, with indication of design of fire dampers and of means of closing the ventilation ducts and openings required to ensure fire safety of the ship (\*);

.1.6 vent pipes and venting equipment (design of flame arresters, flame screens, pressure/vacuum valves and high velocity vents) (\*);

.1.7 sanitary and drain water system and scuppers (\*);

.1.8 cargo and stripping systems (\*);

.1.9 cargo heating system (\*);

.1.10 fueling and fuel transfer system (\*);

.1.11 thermal liquid system (\*);

.2 drawings of power plants piping:

.2.1 live and waste steam and purging systems (\*);

.2.2 feed water, condensate and evaporating plant systems (\*);

.2.3 fuel oil system (\*);

.2.4 lubricating oil system (\*);

.2.5 cooling system (\*);

.2.6 exhaust gas and uptake systems (\*);

.2.7 compressed air system (\*);

.2.8 fuel oil, water and lubricating oil heating systems; structural drawings of assemblies and connections of heating elements (\*);

.2.9 drawings of position and details of attachment of bottom and side valves (\*);

.3 structural drawings of pipelines and ventilation ducts passing through the watertight bulkheads, fire-fighting divisions, decks, and platforms (\*);

.4 drawings of position and details of attachment of bottom and side valves and valves at the collision bulkhead.

**3.4.7 Documentation on machinery and boiler plant:**

.1 drawings of installation and fastening of main machinery and steam boilers (\*);

.2 drawings of equipment of fuel oil and lubricating oil tanks (\*);

.3 drawings of silencers and spark arresters of exhaust pipes and uptakes (\*);

.4 drawings of shafting and sterntube arrangement:

.4.1 thrust, intermediate and propeller shafts (\*);

.4.2 journal and thrust bearings and their fasteners (\*);

.4.3 couplings (\*);

.4.4 sterntube and parts of sterntube arrangement (bushes, bearings, sealings) (\*);

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

.5 drawings of fixed pitch propeller (with blade fastening parts for detachable-blade propeller) (\*);

.6 drawings of controllable pitch propeller (CPP):

.6.1 propeller boss as assembled (\*);

.6.2 blade (\*);

.6.3 propeller shaft and its fastening to the boss (\*);

.6.4 oil distribution boxes as assembled (\*);

.6.5 pitch control units as assembled (\*);

.6.6 shaft of the pitch control unit (\*);

.7 drawings of AMSS installation and securing:

.7.1 general view with necessary sections and sealing details (\*);

.7.2 drawings (\*) and calculations (\*) of propeller, shafts, couplings, pinions, gear wheels of steerable propellers, water-jets and thrusters;

.7.3 drawings of shafts, gearing, rotors, blades and pitch control gear of vertical-axis propellers (\*) as well as strength calculations of the input drive shaft of rotor, blade, gear (\*\*);

.7.4 drawings of bearings and seals (\*);

.7.5 hull member drawings (\*) and calculation of connections (\*\*), drawings of propeller nozzles and tunnels (\*);

.7.6 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 (\*);

.7.7 calculations (\*\*) and diagrams of electric drives for electrically driven AMSS (\*);

.7.8 documentation on monitoring, control, and protection systems (\*\*);

.7.9 torsional vibration calculations (for main AMSS and dynamic positioning systems) and service life calculation of rolling bearings (\*\*).

#### **3.4.8 Documentation on automation equipment:**

.1 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 (\*).

Note: The documentation specified in 3.4.8 shall be submitted by the designer or system integrator (shipyard or, by cooperation, contracted alternative organization/supplier). The documentation shall be developed taking into account the solutions adopted in the technical design documentation.

#### **3.4.9 Documentation on electrical equipment:**

.1 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) (\*);

.2 drawings of cable runs and their penetrations through watertight, gastight and fire-resisting bulkheads, decks and platforms (\*);

.3 assembly drawings (only for non-standard products) including:

.3.1 main switchboards (\*);

.3.2 electric propulsion plant switchboards (\*);

.3.3 emergency switchboards (\*);

.3.4 control stations and panels (\*);

.3.5 special switchboards (\*);

.3.6 power and lighting switchboards (\*);

.4 diagrams and installation and layout drawings of electrical apparatus and facilities for measuring non-electrical values (level, pressure, temperature gauges, etc.) (\*);

.5 diagrams and drawings of radio interference suppression devices (\*);

.6 drawings of layout and installation of essential electrical equipment (\*);

.7 instructions on preparation and application of electrical equipment of oil recovery ship for elimination of an oil spillage. It is to determine the procedure of compulsory disconnection of power consumers having no certificates on explosion proof enclosure (\*\*).

### **3.5 PROGRAMMES OF MOORING AND SEA TRIALS**

3.5.1 Programmes of mooring and sea trials shall be approved by the Register prior to commencement of the relevant trials.

3.5.2 The scope of mooring and sea trials shall comply with the relevant requirements of the Guidelines on Technical Supervision of Ships under Construction.

## 4 CLASSIFICATION OF REFRIGERATING PLANTS

### 4.1 GENERAL

**4.1.1** 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.

**4.1.2** From the number of the refrigerating plants stated in 4.1.1 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** refrigerating plants intended to maintain the required conditions for transportation of liquefied gas in bulk in gas carriers.

Other refrigerating plants from the number of those stated in 4.1.1 subject to the Register supervision are considered unclassified.

### 4.2 CLASS OF A REFRIGERATING PLANT

#### 4.2.1 General.

**4.2.1.1** 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.

**4.2.1.2** 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.

**4.2.1.3** 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.

#### 4.2.2 Class notation of a refrigerating plant.

**4.2.2.1** 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 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;

**REF**★ — for a refrigerating plant built according to the rules of an IACS member society, 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".

**4.2.2.2** 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.

**4.2.2.3** 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".

**4.2.2.4** Distinguishing marks of refrigerating plants.

**4.2.2.4.1** 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.

**4.2.2.4.2** 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.

**4.2.2.4.3** If a refrigerating plant is intended to maintain the required conditions for transportation of liquefied gas in bulk in a gas carrier and complies with applicable requirements of Part XII "Refrigerating Plants" the distinguishing mark **LG** is added to the character of classification of the plant.

**4.2.3 Additional characteristics.**

**4.2.3.1** 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.

**4.2.3.2** Number of thermal containers served by the refrigerating plant is indicated in the Classification Certificate for Refrigerating Plant and in the Register of Ships.

**4.2.4 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.

### **4.3 TECHNICAL DOCUMENTATION OF A REFRIGERATING PLANT**

**4.3.1 Plan approval documentation of a classed refrigerating plant.**

**4.3.1.1** Prior to commencement of a ship's construction, plan approval documentation with a sufficient scope of information to prove that the requirements of the RS rules for a refrigerating plant are complied with, shall be submitted to the Register for review:

- .1** technical description of a refrigerating plant (\*\*);
- .2** cooling capacity calculations with indication of thermal load from each refrigerated cargo space and cold consumer (\*\*);
- .3** general arrangement plans of a refrigerating plant on board the ship (\*);
- .4** circuit diagrams of working and emergency ventilation systems in the refrigerating machinery spaces with indication of the watertight bulkheads and fire-proof divisions, as well as the number of air changes per hour (\*);
- .5** circuit diagrams of refrigerant, cooling medium, cooling water systems with indication of places for installation of instruments and automatic devices (\*);
- .6** air cooling diagram with indication of watertight bulkheads and fire-proof divisions (\*);

- .7 arrangement plans of equipment in refrigerating machinery spaces with indication of escape routes (\*);
- .8 arrangement plans 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 water screen system in refrigerating machinery space (for refrigerant of Group II) (\*);
- .11 general arrangement plans of freezing and cooling arrangements and other refrigerating processing equipment (\*);
- .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 the values of the bounding surface areas of the refrigerated cargo spaces and holds with data on calculated heat transfer coefficient for each surface (\*\*);
- .16 drawings of cargo cooling air ducts in thermoinsulated containers with an indication of the layout on board (\*);
- .17 drawings of air duct insulation with technical data of insulation materials (\*);
- .18 drawings of sealing and flexible joints with indication of details on materials (\*);
- .19 general arrangement plans of atmosphere control installation (\*);
- .20 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 arrangement plans of piping of refrigerant, cooling medium and cooling water system with indication of places of their penetration through the bulkheads, decks and platforms (\*);
- .23 arrangement plan of emergency discharge system of refrigerant outboard (\*).

#### **4.3.2 Test program (\*).**

4.3.2.1 Test program with indication of the method of design thermal 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.

4.3.2.2 The scope of tests shall comply with the relevant requirements of the Guidelines on Technical Supervision of Ships under Construction.

#### **4.3.3 Plan approval documentation of an unclassified refrigerating plant.**

4.3.3.1 Prior to commencement of a ship's construction, plan approval documentation listed in 4.3.1.1.3 — 4.3.1.1.5 (for refrigerant only), 4.3.1.1.7, 4.3.1.1.10, 4.3.1.1.11 (for devices operating under the refrigerant pressure only), 4.3.1.1.12 (for protection and alarm system only), 4.3.1.1.13, 4.3.1.1.14 (for gauges in refrigerant system and protection and alarm devices only), 4.3.1.1.21, 4.3.1.1.22 (for refrigerant only), 4.3.1.1.23 shall be submitted to the Register.

Российский морской регистр судоходства  
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**Часть I**  
**Классификация**

Russian Maritime Register of Shipping  
**Rules for the Classification and Construction of Sea-Going Ships**  
**Part I**  
**Classification**

The edition is prepared  
by Russian Maritime Register of Shipping  
8, Dvortsovaya Naberezhnaya,  
191186, St. Petersburg,  
Russian Federation  
[www.rs-class.org/en/](http://www.rs-class.org/en/)