

**RULES
FOR TECHNICAL SUPERVISION OF
SEA-GOING SHIPS**

Part 29 - POLAR CLASS SHIPS AND ICE CLASS SHIPS

2018

CROATIAN REGISTER OF SHIPPING

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RULES FOR TECHNICAL SUPERVISION OF SEA-GOING SHIPS
Part 29 – POLAR CLASS SHIPS AND ICE CLASS SHIPS

are considered to be applicable from 1st January 2018

The subject Rules include the requirements of the following international Organisations::

International Maritime Organization (IMO)

Conventions: International Convention for the Safety of Life at Sea 1974 (SOLAS 74) as last amended by the resolution MSC.386(94) (new Ch XIV)

International Convention for the Prevention of Pollution from Ships, 1973 as modified by the Protocol 1978 (MARPOL 73/78) as last amended by the resolution MEPC.265(68)

Resolutions: Res. A.1104(29), A.999(25), MSC.385(94), MEPC.264(68)

Circulars: MSC.1/Circ.1519, MSC.1/Circ.1562, MSC.1/Circ.1184, MEPC.1/Circ.856 and MEPC.1/Circ.856/Corr.1, MEPC/Circ.674, MSC-MEPC.5/Circ.12

International Association of Classification Societies (IACS):

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1 GENERAL

1.1 PURPOSE

1.1.1 The purpose of the Rules for Technical Supervision of Polar Waters Ships (hereafter referred to as: the Rules) of CROATIAN REGISTER OF SHIPPING (hereafter referred to as: the *Register*) is to provide guidance on the requirements for ships entering Arctic or Antarctic waters under the provisions of Chapter XIV of the International Convention for the Safety of Life at Sea, 1974, as amended titled "Safety Measures for Ships Operating in Polar Waters", which was adopted by the International Maritime Organization (IMO) by resolution MSC.386(94) on 21 November 2014 as well as to incorporate the statutory requirements of the IMO resolution MSC.385(94) "International Code for Ships Operating in Polar Waters (Polar Code)" as may be amended.

1.1.2 Sections 1 to 10 of these Rules contain the safety requirements prescribed in Part I-A of the Polar Code. Sections 11 to 14 contain the relevant environmental requirements contain in Part II-A of the Polar Code.

1.1.3 These Rules are to be read in conjunction with the Rules for the classification of ships, Part 29 - Polar Class ships and Ice Class ships.

1.1.4 When authorized by the Flag State Administration the *Register* will act on its behalf within limits of such authorization. When certifying systems and items of equipment falling under the scope of the Rules the *Register* will take into account any specific or additional requirements of the Flag State Administration.

Therefore, the Rules, or any part of it, should be applied only if the Flag State Administration has not provided the *Register* with written instruction to apply different interpretation.

In the case of discrepancy between such national requirements and those of the Rules the former shall take precedence

1.2 APPLICATION

1.2.1 Cargo ships of 500 GT and above and all passenger ships operating in Polar waters as defined in 1.3.1 below, constructed on or after 1 January 2017 must comply with part I-A of the Polar Code upon delivery. Cargo ships constructed before 1 January 2017 must meet the part I-A requirements of the Polar Code by the first intermediate or renewal survey for Cargo Ship Safety Construction Certificate, whichever occurs first after 1 January 2018.

Passenger ships constructed before 1 January 2017 must meet the part I-A requirements of the Polar Code by the first renewal survey for Passenger Ship Safety Certificate after 1 January 2018.

1.2.2 All ships (new and existing) operating in Polar waters must comply with part II-A of the Polar Code in accordance with the relevant MARPOL Annexes as follows:

- **Annex I:** all ships;
- **Annex II:** all ships certified to carry noxious liquid substances (NLS) in bulk;
- **Annex IV:** ships engaged in international voyages of 400 gross tonnage and above

- and ships of less than 400 gross tonnage which are certified to carry more than 15 persons; and
- **Annex V:** all ships.

1.3 DEFINITIONS

The definitions of terms which appear in Section 2 to 15 of these Rules are to be as specified below.

1.3.1 **Polar waters** is Arctic waters and/or the Antarctic area.

1.3.2 **Antarctic area** is the sea area south of latitude 60° S. (see Fig. 1.3.2)

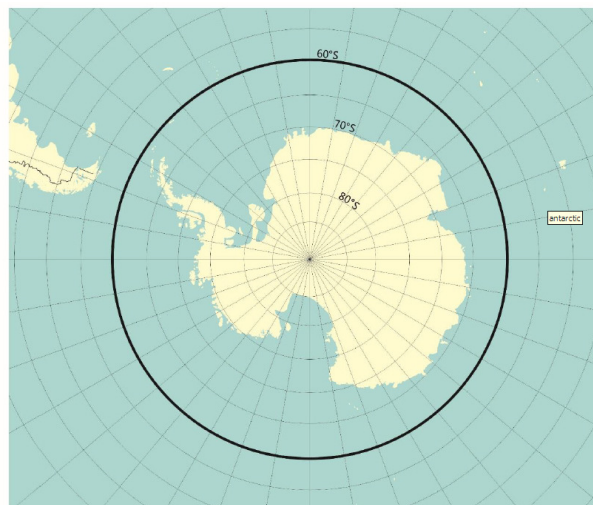
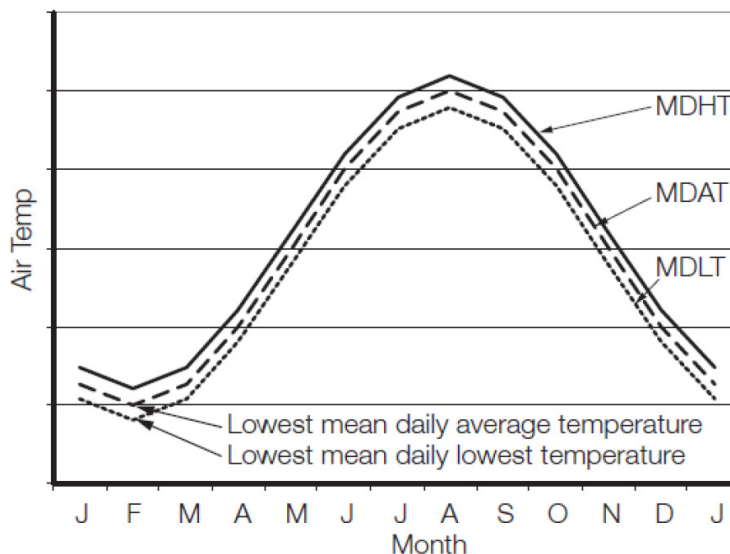


Fig. 1.3.2 - Maximum extent of Antarctic area application

1.3.3 **Arctic waters** are those waters which are located north of a line from the latitude 58°00 .0 N and longitude 042°00 .0 W to latitude 64°37 .0 N, longitude 035°27 .0 W and thence by a rhumb line to latitude 67°03 .9 N, longitude 026°33 .4 W and thence by a rhumb line to the latitude 70°49 .56 N and longitude 008°59 .61 W (Sørkapp, Jan Mayen) and by the southern shore of Jan Mayen to 73°31'.6 N and 019°01'.0 E by the Island of Bjørnøya, and thence by a great circle line to the latitude 68°38 .29 N and longitude 043°23 .08 E (Cape Kanin Nos) and hence by the northern shore of the Asian Continent eastward to the Bering Strait and thence from the Bering Strait westward to latitude 60° N as far as Il'pyrskiy and following the 60th North parallel eastward as far as and including Etolin Strait and thence by the northern shore of the North American continent as far south as latitude 60° N and thence eastward along parallel of latitude 60° N, to longitude 056°37 .1 W and thence to the latitude 58°00 .0 N, longitude 042°00 .0 W. (see Fig. 1.3.3).

Fig. 1.3.22 - Mean Daily Low Temperature (MDLT)



NOTES:

a) Definitions used in the figure above

MDHT – Mean Daily High Temperature

MDAT – Mean Daily Average Temperature

MDLT – Mean Daily Low Temperature

b) Guidance instructions for determining MDLT:

- Determine the daily low temperature for each day for a 10 year period.
- Determine the average of the values over the 10 year period for each day.
- Plot the daily averages over the year.
- Take the lowest of the averages for the season of operation.

1.3.23 Polar Service Temperature (PST) is a temperature specified for a ship which is intended to operate in low air temperature, which shall be set at least 10 °C below the lowest MDLT for the intended area and season of operation in polar waters.

1.3.24 Ship intended to operate in low air temperature is a ship which is intended to undertake voyages to or through areas where the lowest Mean Daily Low Temperature (MDLT) is below - 10 °C.

1.3.25 Upper ice waterline is the waterline defined by the maximum draughts forward and aft for operation in ice.

1.3.26 Tanker is oil tanker as defined in SOLAS regulation II-1/2.22, chemical tankers as defined in SOLAS regulation II-1/3.19 and gas carriers as defined in SOLAS regulation VII/11.2.

1.4 DOCUMENTATION

1.4.1 All ships

The following documentation is to be submitted to the Register:

- .1 general arrangement plan of the ship and tanks plan;
- .2 stability calculation in accordance with 4.3.1, Chapter 4 of the Polar Code for ships operating in areas and during periods where ice accretion is likely to occur, if

typical loading conditions under icing are not specified in the Stability Booklet;

- .3 Report of an operational assessment with hazards of the intended operations based on the sources of hazards listed in the code (see 1.6 below);
- .4 Polar Water Operational Manual;
- .5 Documentation of systems and equipment installed in order to comply with the code and that this is fully functional at the established polar service temperature (PST) for the ship.

1.4.2 New ships

In addition to documentation in 1.4.1 a damage stability calculation for ice class ships of categories A and B constructed after 1 January 2017 is to be submitted, if there are no information on compliance with the requirements of 4.3.2, Chapter 4 of the Polar Code in the Damage Stability Booklet.

1.5 POLAR WATER OPERATIONAL MANUAL

1.5.1 A vessel operating in Polar waters must carry onboard a Polar Water Operational Manual (PWOM), which contains sufficient information regarding the ship's operational capabilities and limitations in order to support the decision-making process of the Master and the crew of the ship.

1.5.2 The PWOM must be developed by the shipowner or ship operator in accordance with Chapter 2 part 1-A of the Polar Code which requires the PWOM to:

- .1 include information on the ship-specific capabilities and limitations as determined by the Operational Assessment (see 1.6 below);
- .2 include or refer to specific risk-based procedures to be followed in normal operations and in order to avoid encountering conditions that exceed the ship's capabilities;

- .3 include or refer to specific risk-based procedures to be followed in the event of incidents in Polar waters;
- .4 include or refer to specific risk-based procedures to be followed in the event that conditions are encountered which exceed the ship's specific capabilities and limitations; and
- .5 include or refer to risk-based procedures to be followed when using icebreaker assistance, as applicable.

1.5.3 The model format contained in Appendix II of the Polar Code, along with the associated guidance, is to be used in the development of the PWOM.

1.5.4 In order to ensure that the PWOM adequately addresses each element listed in the model format contained in Appendix II of the Polar Code, as applicable, the PWOM shall be reviewed (not approved) by the *Register*, prior to the issuance of a Polar Ship Certificate.

1.6 OPERATIONAL ASSESSMENT

1.6.1 In order to establish procedures or operational limitations, an assessment of the ship and its equipment shall be carried by the shipowner or ship operator out in accordance with Polar Code part 1-A paragraph 1.5. This includes taking into consideration the anticipated range of operating and environment conditions (e.g. operation in low air temperature, operation in ice, operation in high latitude, potential for abandonment onto ice or land) and hazards.

1.6.2 The guidance contained in IMO Circular MSC.1/Circ.1519, Guidance on methodologies for assessing operational capabilities and limitations in ice, must be taken into consideration when conducting an Operational Assessment.

1.7 VOYAGE PLANNING

1.7.1 General

In order to ensure that the Company, master and crew are provided with sufficient information to enable operations to be conducted with due consideration to safety of ship and persons on board and, as appropriate, environmental protection the requirement in 1.7.2 are to be complied with.

1.7.2 Requirements

The master shall consider a route through polar waters, taking into account the following:

- .1 the procedures required by the PWOM;
- .2 any limitations of the hydrographic information and aids to navigation available;
- .3 current information on the extent and type of ice and icebergs in the vicinity of the intended route;
- .4 statistical information on ice and temperatures from former years;
- .5 places of refuge;
- .6 current information and measures to be taken when marine mammals are encountered relating to known areas with densi-

- ties of marine mammals, including seasonal migration areas (see MEPC/Circ.674 on Guidance document for minimizing the risk of ship strikes with cetaceans;
- .7 current information on relevant ships' routing systems, speed recommendations and vessel traffic services relating to known areas with densities of marine mammals, including seasonal migration areas (see also above mentioned circular);
- .8 national and international designated protected areas along the route; and
- .9 operation in areas remote from search and rescue (SAR) capabilities (see MSC.1/Circ.1184 on Enhanced contingency planning guidance for passenger ships operating in areas remote from SAR facilities and IMO Res. A.999(25) on Guidelines on voyage planning for passenger ships operating in remote areas).

2. SURVEY AND CERTIFICATION

2.1 SURVEY FOR ISSUE, ENDORSEMENT AND RENEWAL OF THE POLAR SHIP CERTIFICATE

2.1.1 The Polar Ship Certificate together with a Record of Equipment shall be issued to each ship to which Part I-A of the Polar Code applies in accordance with SOLAS 74 regulation XIV/2.

2.1.2 Types of surveys carried out to confirm the compliance with Part I-A of the Polar Code shall be considered as surveys for issue/endorsement/renewal of certificates according to SOLAS 74.

The satisfactory survey results according to SOLAS 74 shall be considered as a requirement for issue/endorsement/renewal of the Certificate according to the Polar Code.

2.1.3 If the Certificate becomes invalid or is invalid for a long period and other certificates remain valid, for renewal of the Certificate, the items additional to those covered by SOLAS 74 shall be subject to survey in a scope specified by the *Register* taking into account the instructions of the Flag State Administration. In this case, the validity period of certificates shall not change according to SOLAS 74.

2.1.4 To confirm the compliance with the Polar Code the following types of surveys shall be established as follows:

- .1 initial survey (after construction, in service) carried out to confirm that the items covered by Part I-A of the Polar Code are surveyed in the necessary scope of initial surveys for issue of the Cargo Ship Safety Construction Certificate, Cargo Ship Safety Equipment Certificate, Cargo Ship Safety Radio Certificate or Passenger Ship Safety Certificate;
- .2 annual survey carried out to confirm that the items covered by Part I-A of the Polar Code are surveyed in the necessary scope of periodical survey of radio equipment and annual survey of cargo ship construction and equipment;
- .3 intermediate survey (second or third annual survey) carried out to confirm that the items covered by Part I-A of the Polar Code and subject to intermediate survey for endorsement of the Cargo Ship Safety Construction Certificate are surveyed in the necessary scope;
- .4 periodical survey (second or third annual survey) carried out to confirm that the items covered by Part I-A of the Polar Code and subject to the periodical survey for endorsement of the Cargo Ship Safety Equipment Certificate are surveyed in the necessary scope;
- .5 renewal survey carried out to confirm that items covered by the Part I-A of the Polar Code are surveyed in the necessary scope

of surveys for renewal of the Cargo Ship Safety Construction Certificate, Cargo Ship Safety Equipment Certificate, Cargo Ship Safety Radio Certificate or Passenger Ship Safety Certificate.

2.1.5 The Certificate is endorsed at annual, intermediate and periodical surveys to confirm the satisfactory results of the scope of surveys in accordance with 2.1.4.2 to 2.1.4.5.

2.1.6 The relevant surveys for issue of certificates according to SOLAS 74 including the additional scope of surveys to confirm the compliance with the Polar Code, shall be carried out and appropriate certificates according to SOLAS 74 shall be issued/endorsed before issue/endorsement of the Certificate.

2.1.7 The ship covered by the Polar Code shall be subject to survey by the *Register* upon shipowner's request and under the authorization of the Flag State Administration given in accordance with SOLAS 74 regulation XI-1/1 to confirm the compliance of the ship with the requirements of Parts I-A and II-A of the Polar Code. When applying Parts I-A and II-A of the Polar Code, the *Register* will also consider the provisions of Parts I-B and II-B of the Code.

2.1.8 The Certificate with the Record of Equipment shall be issued by the *Register* upon completion of the relevant survey (initial, renewal) to confirm the compliance of the ship with the requirements of the Polar Code in addition to certificates according to SOLAS 74.

2.1.9 If the category C ship is confirmed to comply with the requirements of the Polar Code without any additional equipment or structural modification, the Certificate shall be issued based on the abovementioned endorsement, and survey to confirm the compliance with the Polar Code shall be combined with the next periodical survey.

2.1.10 Survey will be conducted using check lists based on MSC-MEPC.5/Circ.12.

3. SHIP STRUCTURE AND MATERIALS

3.1 GENERAL

3.1.1 For ships intended to operate in low air temperature, materials used shall be suitable for operation at the polar service temperature (PST).

3.1.2 In ice strengthened ships, the structure shall be designed to resist both global and local structural loads anticipated under the foreseen ice conditions.

3.2 REQUIREMENTS FOR POLAR CLASS SHIPS

Provisions of Sections 2 and 3 of the *Rules for the classification of ships, Part 29 - Polar Class and Ice Class ships* are to be complied with.

4 STABILITY AND SUBDIVISION

4.1 GENERAL

4.1.1 In order to ensure adequate subdivision and stability ships shall have sufficient stability in intact conditions when subject to ice accretion.

4.1.2 Ships of category A and B, constructed on or after 1 January 2017, shall have sufficient residual stability to sustain ice-related damages.

4.2 REQUIREMENTS FOR POLAR CLASS SHIPS

Provisions of Section 4 of the *Rules for the classification of ships, Part 29 - Polar Class and Ice Class ships* are to be complied with.

5 WATERTIGHT AND WEATHERTIGHT INTEGRITY

5.1 GENERAL

In order to maintain watertight and weathertight integrity all closing appliances and doors relevant to watertight and weathertight integrity of the ship shall be operable in all anticipated environmental conditions.

5.2 REQUIREMENTS FOR POLAR CLASS SHIPS

Provisions of Section 5 of the *Rules for the classification of ships, Part 29 - Polar Class and Ice Class ships* are to be complied with.

6 MACHINERY INSTALLATIONS

6.1 GENERAL

In order to ensure that machinery installations are capable of delivering the required functionality necessary for safe operation of ships machinery installations shall provide functionality under the anticipated environmental conditions, taking into account:

- a) ice accretion and/or snow accumulation;
- b) ice ingestion from seawater;
- c) freezing and increased viscosity of liquids;
- d) seawater intake temperature; and
- e) snow ingestion.

6.2 REQUIREMENTS FOR POLAR CLASS SHIPS

Provisions of Section 6 of the *Rules for the classification of ships, Part 29 - Polar Class and Ice Class ships* are to be complied with.

7 FIRE SAFETY AND PROTECTION

7.1 GENERAL

In order to ensure that fire safety systems and appliances are effective and operable, and that means of escape remain available so that persons on board can safely and swiftly escape to the lifeboat and liferaft embarkation deck under the expected environmental conditions the requirements laid down in Section 7 of the *Rules for the classification of ships, Part 29 - Polar Class and Ice Class ships* are to be complied with.

8 LIFE-SAVING APPLIANCES AND ARRANGEMENTS

8.1 GENERAL

In order provide for safe escape, evacuation and survival of persons onboard ship the requirements laid down in 8.2 to 8.5 below.

8.2 ESCAPE

8.2.1 Exposed escape routes shall remain accessible and safe, taking into consideration the potential icing of structures and snow accumulation.

8.2.2 Survival craft and muster and embarkation arrangements shall provide safe abandonment of ship, taking into consideration the possible adverse environmental conditions during an emergency.

8.2.3 In order to comply with the requirements of paragraphs 8.2.1 and 8.2.2 above, the following apply:

- .1 for ships exposed to ice accretion, means shall be provided to remove or prevent ice and snow accretion from escape routes, muster stations, embarkation areas, survival craft, its launching appliances and access to survival craft;
- .2 in addition, for ships constructed on or after 1 January 2017, exposed escape routes shall be arranged so as not to hinder passage by persons wearing suitable polar clothing; and
- .3 in addition, for ships intended to operate in low air temperatures, adequacy of embarkation arrangements shall be assessed, having full regard to any effect of persons wearing additional polar clothing.

8.3 EVACUATION

8.3.1 All life-saving appliances and associated equipment shall provide safe evacuation and be functional under the possible adverse environmental conditions during the maximum expected time of rescue.

8.3.2 In order to comply with the functional requirement of paragraph 8.3.1 above, the following apply:

- .1 ships shall have means to ensure safe evacuation of persons, including safe deployment of survival equipment, when operating in ice-covered waters, or directly onto the ice, as applicable; and
- .2 where the regulations of this chapter are achieved by means of adding devices requiring a source of power, this source shall be able to operate independently of the ship's main source of power.

8.4 SURVIVAL

8.4.1 Adequate thermal protection shall be provided for all persons on board, taking into account the intended voy-

age, the anticipated weather conditions (cold and wind), and the potential for immersion in polar water, where applicable.

8.4.2 In order to comply with the functional requirement of paragraph 8.4.1 above, the following apply:

- .1 for passenger ships, a proper sized immersion suit or a thermal protective aid shall be provided for each person on board; and
- .2 where immersion suits are required, they shall be of the insulated type.

8.4.3 Life-saving appliances and associated equipment shall take account of the potential of operation in long periods of darkness, taking into consideration the intended voyage.

8.4.4 In addition, for ships intended to operate in extended periods of darkness, in order to comply with the functional requirements of paragraph 8.4.3 above, searchlights suitable for continuous use to facilitate identification of ice shall be provided for each lifeboat.

8.4.5 Taking into account the presence of any hazards, as identified in the assessment in 1.6, resources shall be provided to support survival following abandoning ship, whether to the water, to ice or to land, for the maximum expected time of rescue. These resources shall provide:

- .1 a habitable environment;
- .2 protection of persons from the effects of cold, wind and sun;
- .3 space to accommodate persons equipped with thermal protection adequate for the environment;
- .4 means to provide sustenance for the maximum expected time of rescue;
- .5 safe access and exit points; and
- .6 means to communicate with rescue assets.

8.4.6 In order to comply with the requirement of paragraph 8.4.5 above, the following apply:

8.4.6.1 No lifeboat shall be of any type other than partially or totally enclosed type;

8.4.6.2 Taking into account the assessment referred to in chapter 1, appropriate survival resources, which address both individual (personal survival equipment) and shared (group survival equipment) needs, shall be provided, as follows:

- .1 life-saving appliances and group survival equipment that provide effective protection against direct wind chill for all persons on board;
- .2 personal survival equipment in combination with life-saving appliances or group survival equipment that provide sufficient thermal insulation to maintain the core temperature of persons; and
- .3 personal survival equipment that provide sufficient protection to prevent frostbite of all extremities.

8.4.6.3 In addition, whenever the assessment required under paragraph 1.6 of this Rules identifies a potential of abandonment onto ice or land, the following apply:

- .1 group survival equipment shall be carried, unless an equivalent level of functionality for survival is provided by the ship's normal life-saving appliances;
- .2 when required, personal and group survival equipment sufficient for 110% of the

- persons on board shall be stowed in easily accessible locations, as close as practical to the muster or embarkation stations;
 - .3 containers for group survival equipment shall be designed to be easily movable over the ice and be floatable;
 - .4 whenever the assessment identifies the need to carry personal and group survival equipment, means shall be identified of ensuring that this equipment is accessible following abandonment;
 - .5 if carried in addition to persons, in the survival craft, the survival craft and launching appliances shall have sufficient capacity to accommodate the additional equipment;
 - .6 passengers shall be instructed in the use of the personal survival equipment and the action to take in an emergency; and
 - .7 the crew shall be trained in the use of the personal survival equipment and group survival equipment.
- Water containers & water purification tablets,
 - Spare set of personal survival equipment,
 - Group survival equipment container (waterproof and floatable).

8.5 PERSONAL AND GROUP SURVIVAL EQUIPMENT

8.5.1 When considering resources to be included with the personal survival equipment, the following equipment should be taken into account:

- protective clothing (hat, gloves, socks, face and neck protection, etc.),
- skin protection cream,
- thermal protective aid,
- sunglasses,
- whistle,
- drinking mug,
- penknife,
- Polar survival guidance,
- emergency food,
- carrying bag.

8.5.2 When considering resources to be included in the group survival equipment, the following equipment should be taken into account:

- Shelter, tents or storm shelters or equivalent, sufficient for maximum number of persons,
- Thermal protective aids or similar sufficient for maximum number of persons,
- Sleeping bags – sufficient for at least one between two persons,
- Foam sleeping mats or similar - sufficient for at least one between two persons,
- Shovels, at least 2,
- Sanitation (e.g. toilet paper),
- Stove and fuel sufficient for maximum number of persons ashore and maximum anticipated time of rescue,
- Emergency food - sufficient for maximum number of persons ashore and maximum anticipated time of rescue,
- Flashlights - one per shelter,
- Waterproof and windproof matches - two boxes per shelter,
- Whistle,
- Signal mirror,

9 SAFETY OF NAVIGATION

9.1 GENERAL

In order for safe navigation the requirements laid down in 9.2 to 9.4 below are to be complied with.

9.2 NAUTICAL INFORMATION

9.2.1 Ships shall have means of receiving and displaying current information on ice conditions in the area of operation. The requirement can be met by the following provisions:

- meteorological fax receiver capable of receiving ice regime or equivalent equipment (Internet e-mails if available), or
- radar system capable of identifying ice target.

9.3 NAVIGATIONAL EQUIPMENT FUNCTIONALITY

9.3.1 The navigational equipment and systems shall be designed, constructed, and installed to retain their functionality under the expected environmental conditions in the area of operation.

9.3.1.1 In order to comply with the requirement of 9.3.1 above, the following apply:

- .1 ships constructed on or after 1 January 2017, ice strengthened in accordance with Section 3 of these Rules 3, shall have either two independent echo-sounding devices or one echo-sounding device with two separate independent transducers;
- .2 ships shall comply with SOLAS regulation V/22.1.9.4, irrespective of the date of construction and the size and, depending on the bridge configuration, a clear view astern;
- .3 for ships operating in areas, and during periods, where ice accretion is likely to occur, means to prevent the accumulation of ice on antennas required for navigation and communication shall be provided; and
- .4 in addition, for ships ice strengthened in accordance with chapter 3, the following apply:
 - .4.1 where equipment required by SOLAS chapter V or this Section have sensors that project below the hull, such sensors shall be protected against ice; and
 - .4.2 in category A and B ships constructed on or after 1 January 2017, the bridge wings shall be enclosed or designed to protect navigational equipment and operating personnel.

9.3.2 Systems for providing reference headings and position fixing shall be suitable for the intended areas.

9.3.2.1 In order to comply with the 9.3.2 above, the following apply:

- .1 ships shall have two non-magnetic means to determine and display their heading.

Both means shall be independent and shall be connected to the ship's main and emergency source of power; and

- .2 ships proceeding to latitudes over 80 degrees shall be fitted with at least one GNSS compass or equivalent, which shall be connected to the ship's main and emergency source of power.

9.4 ADDITIONAL NAVIGATIONAL EQUIPMENT

9.4.1 Ships shall have the ability to visually detect ice when operating in darkness.

9.4.1.1 In order to comply with the requirement of 9.4.1 above ships, with the exception of those solely operating in areas with 24 hours daylight, shall be equipped with two remotely rotatable, narrow-beam search lights controllable from the bridge to provide lighting over an arc of 360 degrees, or other means to visually detect ice.

9.4.2 Ships involved in operations with an icebreaker escort shall have suitable means to indicate when the ship is stopped.

9.4.2.1 In order to comply with the requirement in 9.4.2, ships involved in operations with an icebreaker escort shall be equipped with a manually initiated flashing red light visible from astern to indicate when the ship is stopped. This light shall have a range of visibility of at least two nautical miles, and the horizontal and vertical arcs of visibility shall conform to the stern light specifications required by the International Regulations for Preventing Collisions at Sea.

10 COMMUNICATION

10.1 GENERAL

In order to provide for effective communication for ships and survival craft during normal operation and in emergency situations the requirements laid down in 10.2 and 10.3 are to be complied with.

10.2 SHIP COMMUNICATION

10.2.1 Two-way voice and/or data communications ship-to-ship and ship-to-shore shall be available at all points along the intended operating routes.

10.2.1.1 In order to comply with the requirements in 10.2.1 above, communication equipment on board shall have the capabilities for ship-to-ship and ship-to-shore communication, taking into account the limitations of communications systems in high latitudes and the anticipated low temperature.

10.2.2 Suitable means of communications shall be provided where escort and convoy operations are expected.

10.2.2.1 In order to comply with the requirements in 10.2.2 above, ships intended to provide icebreaking escort shall be equipped with a sound signalling system mounted to face astern to indicate escort and emergency manoeuvres to following ships as described in the International Code of Signals.

10.2.3 Means for two-way on-scene and SAR coordination communications for search and rescue purposes including aeronautical frequencies shall be provided.

10.2.3.1 In order to comply with the requirements in 10.2.3 above, two-way on-scene and SAR coordination communication capability in ships shall include:

- .1 voice and/or data communications with relevant rescue coordination centres; and
- .2 equipment for voice communications with aircraft on 121.5 and 123.1 MHz.

10.2.4 Appropriate communication equipment to enable telemedical assistance in polar areas shall be provided.

10.2.4.1 In order to comply with the requirements in 10.2.4 above, the communication equipment shall provide for two-way voice and data communication with a Telemedical Assistance Service (TMAS).

10.3 SURVIVAL CRAFT AND RESCUE BOAT COMMUNICATIONS CAPABILITIES

10.3.1 For ships intended to operate in low air temperature, all rescue boats and lifeboats, whenever released for evacuation, shall maintain capability for distress alerting, locating and on-scene communications.

10.3.1.1 For ships intended to operate in low air temperature, in order to comply with the requirements in 10.3.1 above, all rescue boats and lifeboats, whenever released for evacuation, shall:

- .1 for distress alerting, carry one device for transmitting ship to shore alerts (typically EPIRB);

- .2 in order to be located, carry one device for transmitting signals for location (typically SART); and
- .3 for on-scene communications, carry one device for transmitting and receiving on-scene communications (typically VHF radio).

10.3.2 For ships intended to operate in low air temperature, all other survival craft, whenever released, shall maintain capability for transmitting signals for location and for communication.

10.3.2.1 For ships intended to operate in low air temperature, in order to comply with the requirements in 10.3.2 above, all other survival craft shall:

- .1 in order to be located, carry one device for transmitting signals for location; and
- .2 for on-scene communications, carry one device for transmitting and receiving on-scene communications.

10.3.3 Mandatory communication equipment for use in survival craft, including liferafts, and rescue boats shall be capable of operation during the maximum expected time of rescue.

10.3.3.1 In order to comply with the requirements in 10.3.3 above, recognizing the limitations arising from battery life, procedures shall be developed and implemented such that mandatory communication equipment for use in survival craft, including liferafts, and rescue boats are available for operation during the maximum expected time of rescue.

11 PREVENTION OF POLLUTION BY OIL

11.1 OPERATIONAL REQUIREMENTS

11.1.1 In Arctic waters any discharge into the sea of oil or oily mixtures from any ship shall be prohibited.

11.1.2 The provisions of paragraph 11.1.1 shall not apply to the discharge of clean or segregated ballast.

11.1.3 Subject to the approval of the Flag State Administration, a category A ship constructed before 1 January 2017 that cannot comply with paragraph 11.1.1 for oil or oily mixtures from machinery spaces and is operating continuously in Arctic waters for more than 30 days shall comply with paragraph 11.1.1 not later than the first intermediate or renewal survey, whichever comes first, one year after 1 January 2017. Until such date these ships shall comply with the discharge requirements of MARPOL, Annex I, Regulation 15.3.

11.1.4 Operation in polar waters shall be taken into account, as appropriate, in the Oil Record Books, manuals and the shipboard oil pollution emergency plan or the shipboard marine pollution emergency plan as required by MARPOL, Annex I.

11.2 STRUCTURAL REQUIREMENTS

11.2.1 For category A and B ships constructed on or after 1 January 2017 with an aggregate oil fuel capacity of less than 600 m³, all oil fuel tanks shall be separated from the outer shell by a distance of not less than 0.76 m. This provision does not apply to small oil fuel tanks with a maximum individual capacity not greater than 30 m³.

11.2.2 For category A and B ships other than oil tankers constructed on or after 1 January 2017, all cargo tanks constructed and utilized to carry oil shall be separated from the outer shell by a distance of not less than 0.76 m.

11.2.3 For category A and B oil tankers of less than 5,000 tonnes deadweight constructed on or after 1 January 2017, the entire cargo tank length shall be protected with:

- .1 double bottom tanks or spaces complying with the applicable requirements of regulation 19.6.1 of MARPOL Annex I; and
- .2 wing tanks or spaces arranged in accordance with regulation 19.3.1 of MARPOL Annex I and complying with the applicable requirements for distance referred to in regulation 19.6.2 of MARPOL Annex I.

11.2.4 For category A and B ships constructed on or after 1 January 2017 all oil residue (sludge) tanks and oily bilge water holding tanks shall be separated from the outer shell by a distance of not less than 0.76 m. This provision does not apply to small tanks with a maximum individual capacity not greater than 30 m³.

11.3 ADDITIONAL GUIDANCE TO THIS SECTION

1.3.1 Ships are encouraged to apply regulation 43 of MARPOL Annex I when operating in Arctic waters.

1.3.2 Non-toxic biodegradable lubricants or water-based systems should be considered in lubricated components located outside the underwater hull with direct seawater interfaces, like shaft seals and slewing seals.

12 CONTROL OF POLLUTION BY NOXIOUS LIQUID SUBSTANCES IN BULK

12.1 OPERATIONAL REQUIREMENTS

12.1.1 In Arctic waters any discharge into the sea of noxious liquid substances (NLS), or mixtures containing such substances, shall be prohibited.

12.1.2 Operation in polar waters shall be taken into account, as appropriate, in the Cargo Record Book, the Manual and the shipboard marine pollution emergency plan for noxious liquid substances or the shipboard marine pollution emergency plan as required by MARPOL Annex II.

12.1.3 For category A and B ships constructed on or after 1 January 2017, the carriage of NLS identified in chapter 17, column e, as ship type 3 or identified as NLS in chapter 18 of the International Code for the Construction and Equipment of Ships Carrying Dangerous Chemicals in Bulk in cargo tanks of type 3 ships shall be subject to the approval of the Flag State Administration. The results shall be reflected on the International Pollution Prevention Certificate for the Carriage of Noxious Liquid Substances in Bulk or Certificate of Fitness identifying the operation in polar waters.

12.2 ADDITIONAL GUIDANCE IN RESPECT TO CARRIAGE OF NLS

Category A and B ships, constructed on or after 1 January 2017 and certified to carry noxious liquid substances (NLS), are encouraged to carry NLS identified in chapter 17, column e, as ship type 3 or identified as NLS in chapter 18 of the International Code for the Construction and Equipment of Ships Carrying Dangerous Chemicals in Bulk, in tanks separated from the outer shell by a distance of not less than 760 mm.

13 PREVENTION OF POLLUTION BY SEWAGE FROM SHIPS

13.1 DEFINITIONS

13.1.1 Constructed means a ship the keel of which is laid or which is at a similar stage of construction.

13.1.2 Ice-shelf means a floating ice sheet of considerable thickness showing 2 to 50 m or more above sea-level, attached to the coast.

13.1.3 Fast ice means sea ice which forms and remains fast along the coast, where it is attached to the shore, to an ice wall, to an ice front, between shoals or grounded icebergs.

13.2 OPERATIONAL REQUIREMENTS

13.2.1 Discharges of sewage within polar waters are prohibited except when performed in accordance with MARPOL Annex IV and the following requirements:

- .1 the ship is discharging comminuted and disinfected sewage in accordance with regulation 11.1.1 of MARPOL Annex IV at a distance of more than 3 nautical miles from any ice-shelf or fast ice and shall be as far as practicable from areas of ice concentration exceeding 1/10; or
- .2 the ship is discharging sewage that is not comminuted or disinfected in accordance with regulation 11.1.1 of MARPOL Annex IV and at a distance of more than 12 nautical miles from any ice-shelf or fast ice and shall be as far as practicable from areas of ice concentration exceeding 1/10; or
- .3 the ship has in operation an approved sewage treatment plant certified by the Flag State Administration to meet the operational requirements in either regulation 9.1.1 or 9.2.1 of MARPOL Annex IV, and discharges sewage in accordance with regulation 11.1.2 of Annex IV and shall be as far as practicable from the nearest land, any ice-shelf, fast ice or areas of ice concentration exceeding 1/10.

13.2.2 Discharge of sewage into the sea is prohibited from category A and B ships constructed on or after 1 January 2017 and all passenger ships constructed on or after 1 January 2017, except when such discharges are in compliance with paragraph 13.2.1.3 of this section.

13.2.3 Notwithstanding the requirements of paragraph 13.2.1, category A and B ships that operate in areas of ice concentrations exceeding 1/10 for extended periods of time, may only discharge sewage using an approved sewage treatment plant certified by the Flag State Administration to meet the operational requirements in either regulation 9.1.1 or 9.2.1 of MARPOL, Annex IV. Such discharges shall be subject to the approval by the Flag State Administration.

14 PREVENTION OF POLLUTION BY GARBAGE FROM SHIPS

14.1 DEFINITIONS

14.1.1 Ice-shelf means a floating ice sheet of considerable thickness showing 2 to 50 m or more above sea-level, attached to the coast.

14.1.2 Fast ice means sea ice which forms and remains fast along the coast, where it is attached to the shore, to an ice wall, to an ice front, between shoals or grounded icebergs.

14.2 OPERATIONAL REQUIREMENTS

14.2.1 In Arctic waters, discharge of garbage into the sea permitted in accordance with regulation 4 of MARPOL Annex V, shall meet the following additional requirements:

- .1 discharge into the sea of food wastes is only permitted when the ship is as far as practicable from areas of ice concentration exceeding 1/10, but in any case not less than 12 nautical miles from the nearest land, nearest ice-shelf, or nearest fast ice;
- .2 food wastes shall be comminuted or ground and shall be capable of passing through a screen with openings no greater than 25 mm. Food wastes shall not be contaminated by any other garbage type;
- .3 food wastes shall not be discharged onto the ice;
- .4 discharge of animal carcasses is prohibited; and
- .5 discharge of cargo residues that cannot be recovered using commonly available methods for unloading shall only be permitted while the ship is en route and where all the following conditions are satisfied:
 - .1 cargo residues, cleaning agents or additives, contained in hold washing water do not include any substances classified as harmful to the marine environment, taking into account guidelines developed by the Organization;
 - .2 both the port of departure and the next port of destination are within Arctic waters and the ship will not transit outside Arctic waters between those ports;
 - .3 no adequate reception facilities are available at those ports taking into account guidelines developed by the Organization; and
 - .4 where the conditions of subparagraphs 14.2.1.5.1, 14.2.1.5.2 and 14.2.1.5.3 of this paragraph have been fulfilled, discharge of cargo hold washing water containing residues shall be made as far as practicable from areas of ice concentration exceeding 1/10, but in any case not less than 12 nautical

miles from the nearest land, nearest ice shelf, or nearest fast ice.

14.2.2 In the Antarctic area, discharge of garbage into the sea permitted in accordance with regulation 6 of MARPOL Annex V, shall meet the following additional requirements:

- .1 discharges under regulation 6.1 of MARPOL Annex V shall be as far as practicable from areas of ice concentration exceeding 1/10, but in any case not less than 12 nautical miles from the nearest fast ice; and
- .2 food waste shall not be discharged onto ice.

14.2.3 Operation in polar waters shall be taken into account, as appropriate, in the Garbage Record Book, Garbage Management Plan and the placards as required by MARPOL Annex V.

14.3 ADDITIONAL GUIDANCE TO THIS SECTION

In order to minimize the risks associated with animal cargo mortalities, consideration should be given to how animal carcasses will be managed, treated, and stored on board when ships carrying such cargo are operating in polar waters. Reference is made in particular to the 2012 Guidelines for the implementation of MARPOL Annex V (IMO Res. MEPC.219(63), as amended by IMO Res. MEPC.239(65)) and the 2012 Guidelines for the development of garbage management plans (IMO Res. MEPC.220(63)).

15 ADDITIONAL GUIDANCE UNDER OTHER ENVIRONMENTAL CONVENTIONS AND GUIDELINES

15.1 The ballast water management provisions of the ballast water exchange standard, set out in regulation D-1, or the ballast water performance standard, set out in regulation D-2 of the BWM Convention should be considered as appropriate. The provisions of the Guidelines for ballast water exchange in the Antarctic treaty area (IMO Res. MEPC.163(56))

should be taken into consideration along with other relevant guidelines developed by the Organization.

15.2 In selecting the ballast water management system, attention should be paid to limiting conditions specified in the appendix of the Type Approval Certificate and the temperature under which the system has been tested, in order to ensure its suitability and effectiveness in polar waters.

15.3 In order to minimize the risk of invasive aquatic species transfers via biofouling, measures should be considered to minimize the risk of more rapid degradation of anti-fouling coatings associated with polar ice operations. Reference is made in particular to the 2011 Guidelines for the control and management of ships' biofouling to minimize the transfer of invasive aquatic species (IMO Res. MEPC.207(62)).

Table 15.3 - Example of matters related to anti-fouling systems taken into consideration by some ice-going ships

	Hull	Sea chest
Year round operation in ice-covered polar waters		<ul style="list-style-type: none"> - Abrasion resistant coating. - Compliant with the AFS Convention. Thickness of anti-fouling system to be decided by shipowner.
Intermittent operation in ice-covered polar waters	<ul style="list-style-type: none"> - Abrasion resistant low friction ice coating. - In sides, above bilge keel, max thickness of anti-fouling system 75 µm, to protect hull between application of anti-fouling system and next anticipated voyage to ice-covered waters. In bottom area thickness to be decided by shipowner. Composition of anti-fouling system should also be decided by the shipowner. 	<ul style="list-style-type: none"> - Compliant with the AFS Convention. Thickness of anti-fouling system to be decided by shipowner.
Category B and C vessels	<ul style="list-style-type: none"> - Compliant with the AFS Convention. Thickness of anti-fouling system to be decided by shipowner. 	<ul style="list-style-type: none"> - Compliant with the AFS Convention. Thickness of anti-fouling system to be decided by shipowner.

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