IMO Polar Code operational requirements
FOREWORD

DNV GL class guidelines contain methods, technical requirements, principles and acceptance criteria related to classed objects as referred to from the rules.

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Any comments may be sent by e-mail to rules@dnvgl.com

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Changes – Current

This document supersedes the July 2019 edition of DNVGL-CG-0308. Numbering and/or title of items containing changes are highlighted in red colour.

Changes July 2020

<table>
<thead>
<tr>
<th>Topic</th>
<th>Reference</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>Alignment with IMO interim guideline for life saving appliances in polar waters MSC.1/Circ.1614, 26 June 2019</td>
<td>Sec.1 Table 12 1.1 and 2.1</td>
<td>Detailed guidelines for equipment to be included in personal survival equipment (PSE).</td>
</tr>
<tr>
<td></td>
<td>Sec.1 Table 12 3.1</td>
<td>Detailed guidelines for lifeboats and survival crafts ventilation.</td>
</tr>
<tr>
<td></td>
<td>Sec.1 Table 12 4.1.1, 4.1.2, 4.1.3, 4.1.4 and 4.1.5</td>
<td>Detailed guidelines for resources provided in life crafts in the case of low temperatures.</td>
</tr>
<tr>
<td></td>
<td>Sec.1 Table 12 5.1, 5.2 and 5.3</td>
<td>Detailed guidelines for group survival equipment in the case of abandonment onto ice or land.</td>
</tr>
</tbody>
</table>

Editorial corrections

In addition to the above stated changes, editorial corrections may have been made.
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SECTION 1 GUIDANCE TO IMO POLAR CODE COMPLIANCE

1 General

1.1 Introduction
The International Code for Ships Operating in Polar Waters (IMO Polar Code), entered into force on 1. January 2017, provides for safe operation and protection of environment in polar waters by addressing risks and hazards identified for the area and period of operation, and not adequately mitigated by other instruments of the organization.

1.2 Objective
This class guideline provides interpretations, alternative solutions and best practices to cover IMO Polar Code operational requirements, including instructions and procedures to be followed onboard a ship in order to be suitably prepared for operations in polar waters.

1.3 Scope
This class guideline includes proposals and alternative solutions considering the most probable operational risks that may occur during operation in polar waters. Any risk mitigation measures should be based on the results of the operational assessment, as required by the Polar Code and the operational limitations identified on the polar ship certificate. Hence, other measures not proposed by this document may be considered.

1.4 Application
The guidelines are applicable to ships intended to operate within the Arctic and Antarctic areas as defined in the IMO Polar Code.

1.5 Structure of the guidelines
1.5.1 The structure of this document consists mainly of operational regulations from the IMO Polar Code and the corresponding guidelines listen in the same row.

1.5.2 The regulations are structured in such a way that the guidelines can be filtered based on identified hazards for ships operation by following the first column of table under each set of regulations.

1.5.3 All general and specific guidelines applicable for category C, are automatically applicable for category B and A, given that the same set of identified hazards is applicable.

1.5.4 All general and specific guidelines applicable for category B, are automatically applicable for category A, given that the same set of identified hazards is applicable.
1.6 Definitions

1.6.1 Definitions and abbreviations

Table 1 Definitions

<table>
<thead>
<tr>
<th>Term</th>
<th>Definition</th>
</tr>
</thead>
<tbody>
<tr>
<td>medium first-year ice</td>
<td>first-year ice, 70 cm to 120 cm thick, see WMO</td>
</tr>
<tr>
<td>thin first-year ice</td>
<td>first-year ice, 30 cm to 70 cm thick, see WMO</td>
</tr>
<tr>
<td>grey ice</td>
<td>young ice, 10 cm to 15 cm thick, that is less elastic than Nilas, it often breaks from swells</td>
</tr>
<tr>
<td>grey white</td>
<td>young ice, 15 cm to 30 cm thick</td>
</tr>
<tr>
<td>ice free waters</td>
<td>no ice present, if ice of any kind is present, this term shall not be used, see WMO.</td>
</tr>
<tr>
<td>open waters</td>
<td>large area of freely navigable water in which sea ice is present in concentrations less than 1/10 No ice of land origin is present, see WMO.</td>
</tr>
<tr>
<td>old ice</td>
<td>sea ice which has survived at least one summer’s melt, typical thickness up to 3 m or more It is subdivided into residual first-year ice, second-year ice and multi-year ice, see WMO.</td>
</tr>
<tr>
<td>escort</td>
<td>any ship with superior ice capability in transit with another ship</td>
</tr>
<tr>
<td>habitable environment</td>
<td>ventilated environment that will protect against hypothermia</td>
</tr>
<tr>
<td>maximum expected time of</td>
<td>time adopted for the design of equipment and system that provide survival support It shall never be less than 5 days.</td>
</tr>
<tr>
<td>rescue</td>
<td>maximum expected time of rescue</td>
</tr>
<tr>
<td>polar service temperature</td>
<td>temperature specified for a ship intended to operate in low air temperature, which shall be set at least 10°C colder than the lowest MDLT for the intended area and season of operation in polar waters</td>
</tr>
<tr>
<td>ship intended to operate</td>
<td>ship which is intended to undertake voyages to or through areas where the lowest MDLT is below -10°C</td>
</tr>
<tr>
<td>in low air temperature</td>
<td>ship intended to operate in low air temperature</td>
</tr>
<tr>
<td>mean daily low temperature</td>
<td>mean value of the daily low temperature for each day of the year over a minimum 10 years period A data set acceptable to the administration may be used if 10 years of data is not available.</td>
</tr>
<tr>
<td>high latitude</td>
<td>latitudes over 80 degrees</td>
</tr>
</tbody>
</table>

Table 2 Abbreviations

<table>
<thead>
<tr>
<th>Abbreviation</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>GSE</td>
<td>group survival equipment</td>
</tr>
<tr>
<td>MDLT</td>
<td>mean daily low temperature</td>
</tr>
<tr>
<td>PSE</td>
<td>personal survival equipment</td>
</tr>
<tr>
<td>PST</td>
<td>polar service temperature</td>
</tr>
</tbody>
</table>
### 1.6.2 The Antarctic area and Arctic waters, as defined in SOLAS regulations XIV/1.2 and XIV/1.3, respectively, and MARPOL Annex I, regulations 1.11.7 and 46.2, Annex II, regulations 13.8.1 and 21.2, Annex IV, regulations 17.2 and 17.3, and Annex V, regulations 1.14.7 and 13.2, are represented in respectively DNVGL-RU-SHIP Pt.6 Ch.6 Sec.4 Figure 2 and DNVGL-RU-SHIP Pt.6 Ch.6 Sec.4 Figure 3.

### 1.6.3 Reference to external documents
Documents referenced in this document are listed in Table 3.

#### Table 3 Reference to external documents

<table>
<thead>
<tr>
<th>Code</th>
<th>Title</th>
</tr>
</thead>
<tbody>
<tr>
<td>WMO</td>
<td>Sea-Ice Nomenclature</td>
</tr>
<tr>
<td>STCW</td>
<td>The International Convention on Standards of Training, Certification and Watchkeeping for Seafarers, 1978, as amended</td>
</tr>
<tr>
<td>SOLAS regulation XIV</td>
<td>Measure for safety of ships operating in polar water</td>
</tr>
<tr>
<td>MARPOL Annex I</td>
<td>Prevention of pollution by oil</td>
</tr>
<tr>
<td>MARPOL Annex II</td>
<td>Control of pollution by noxious liquid substances</td>
</tr>
<tr>
<td>MARPOL Annex IV</td>
<td>Prevention of pollution by sewage from ships</td>
</tr>
<tr>
<td>MARPOL Annex V</td>
<td>Prevention of pollution by garbage from ships</td>
</tr>
</tbody>
</table>

### 2 Design conditions

#### 2.1 Ice conditions
Typical environmental conditions and appropriate class notations for qualifiers C, B and A are listed in Table 4.

#### Table 4 Typical design environmental conditions for POLAR

<table>
<thead>
<tr>
<th>Category</th>
<th>Ice conditions</th>
<th>Design ice condition</th>
<th>Ice class</th>
<th>Ice concentration</th>
<th>Decision support system</th>
</tr>
</thead>
<tbody>
<tr>
<td>A</td>
<td>Other ice conditions(^1)</td>
<td>Up to heavy multi year ice</td>
<td>PC(2) and PC(1)(^2)</td>
<td>≥ 1/10</td>
<td>Polaris or equivalent required</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Up to light multi year ice, less than 2.5 m thick</td>
<td>PC(3)(^2)</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>Up to second year ice</td>
<td>PC(4)(^2)</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>Up to thick first year ice</td>
<td>PC(5)(^2)</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Category</td>
<td>Ice conditions</td>
<td>Design ice condition</td>
<td>Ice class</td>
<td>Ice concentration</td>
<td>Decision support system</td>
</tr>
<tr>
<td>----------</td>
<td>----------------</td>
<td>---------------------</td>
<td>-----------</td>
<td>------------------</td>
<td>-------------------------</td>
</tr>
<tr>
<td>B</td>
<td>Other ice conditions¹</td>
<td>Up to medium first year ice which may include old ice conditions</td>
<td>PC(6)²</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>Up to medium first year ice less than 1 m thick which may include old ice conditions</td>
<td>PC(7)² and Ice(1A*)²³</td>
<td></td>
<td></td>
</tr>
<tr>
<td>C</td>
<td>Other ice conditions less severe than those included in categories A and B¹</td>
<td>Up to medium first year ice less than 1 m thick</td>
<td>Ice(1A*)²</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>Up to thin first year ice 2nd stage</td>
<td>Ice(1A)²</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>Up to thin first year ice 1st stage</td>
<td>Ice(1B)²</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>Up to grey white ice</td>
<td>Ice(1C)²</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>Grey ice</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>New ice</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>Open waters</td>
<td>Large area of freely navigable water in which sea ice is present</td>
<td>Ice(C), Ice(E) and none²</td>
<td>&lt; 1/10</td>
<td>No decision supp. required</td>
</tr>
<tr>
<td></td>
<td>Ice free</td>
<td>No ice</td>
<td></td>
<td>0</td>
<td></td>
</tr>
</tbody>
</table>

Notes:

1) For ice classed vessels planning to operate in other ice conditions, proper crew training according to regulations, see [12.1], shall be in place together with the use of an appropriate decision support system, such as Polaris, the Canada’s Arctic Ice Regime Shipping System, and/or the Russian ice certificate as described in the rules of navigation on the water area of the Northern Sea Route.

2) Ice classed vessels may be permitted to operate in other ice conditions higher than its full ice capacity provided the risk index outcome from the decision support system used onboard is found to be positive.

3) An Ice(1A*) classed vessel may be considered category B, provided that, by experience, it has been proven that ship structure, equipment and crew are able to operate safely in the ice conditions required by category.
3 General guidelines

3.1 Ice accretion

3.1.1 The effect of ice accretion can be prevented by reducing the speed in heavy seas to avoid bow pounding and sea spray or by preparing the ship with anti-icing and/or anti-freezing measures. A combination of both is the most effective way of minimizing the effect of sea spray icing.

3.1.2 Actions for icing avoidance should be included in the PWOM.

3.1.3 De-icing measures are means to be available onboard for icing reduction. De-icing means should be easily accessible onboard and should be listed in the PWOM with location.

3.2 Anti-icing and anti-freezing measures

3.2.1 Where anti-icing and anti-freezing are measures to be taken to meet IMO Polar Code requirements, the following are examples of acceptable solutions:

— Equipment and areas that require anti-icing measures should as far as possible be situated in protected locations, so that sea spray cannot reach it. This may be accomplished by using fully enclosed spaces, semi-enclosures, recesses with removable curtains in front, or similar. A shielded location will be the simplest and most reliable solution for anti-icing wherever it is possible.

— Heating of spaces may be necessary depending on the type of equipment located therein.

— Hard removable covers may also be applicable for some types of equipment. Cover by canvas may be acceptable for some types of equipment, like fire monitors. Supply of heated air may be an alternative if the equipment in question is enclosed under a cover, hard cover or canvas.

— The use of electric heating blankets or heat tracing may be a solution for protection of equipment on open deck.

— When severe icing is highly anticipated in the area and during the period of operation, preference is given to passive measures for anti-icing/anti-freezing protection (such as enclosures) versus de-icing or active measures for anti-icing/anti-freezing protection (such as heat tracing). Passive measures are inherently more effective, more efficient, and contribute to reducing emissions to the environment.

3.2.2 The heating capacity for anti-icing and anti-freezing arrangements should be sufficient to prevent icing or freezing under the design environmental conditions. Anti-icing and anti-freezing arrangements should be able to maintain a surface temperature of at least +3°C.

3.2.3 In anti-icing and anti-freezing arrangements using heating, special attention should be paid to the heat transfer from the heating cables or pipes to the equipment or structure to be heated. The spacing and fastening of heating cables or pipes should be, as much as practical, appropriate for efficient heating to keep the equipment or structure ice-free under the design environmental conditions. Appropriate spacing may be established by heat balance calculations.

3.2.4 For anti-icing and de-icing arrangements applying heating by fluids in pipes, the installation should be arranged to ensure that the heating fluid maintains its heating effectiveness under the polar service temperature PST. The appropriate amount of insulation and the rate of circulation may be established by heat balance calculations.

3.3 De-icing measures

3.3.1 De-icing may be carried out by fixed heating arrangements or by use of portable equipment.
Portable equipment may consist of:
   — hoses for steam blowing
   — hoses for heated water flushing
   — mallets (wooden, rubber or plastic hammers)
   — snow blowers
   — shovels.

3.3.2 De-icing equipment should be located in areas where it is readily available and protected from icing and other adverse conditions. It is preferable to store de-icing equipment inside the ship. Where it is stored outside, the storage facilities should be afforded anti-icing protection to ensure it is readily accessible.

3.3.3 Steam- or water-based de-icing equipment should be stored in heated spaces or containers that are kept above freezing temperature to prevent hoses from freezing.

4 Operational assessment

4.1 General

4.1.1 In order to establish procedures or operational limitations, an assessment of the ship and its equipment shall be carried out, taking into consideration the following:

4.1.2 The anticipated range of operating and environmental conditions, such as:
   — operation in low air temperature
   — operation in ice
   — operation in high latitude
   — potential for abandonment onto ice or land.

4.1.3 Hazards which may lead to elevated levels of risk due to increased probability of occurrence, more severe consequences, or both, as applicable:
   — ice, as it may affect hull structure, stability characteristics, machinery systems, navigation, the outdoor working environment, maintenance and emergency preparedness tasks and malfunction of safety equipment and systems
   — topside icing, with potential reduction of stability and equipment functionality
   — low temperature, as it affects the working environment and human performance, maintenance and emergency preparedness tasks, material properties and equipment efficiency, survival time and performance of safety equipment and systems
   — extended periods of darkness or daylight as it may affect navigation and human performance
   — high latitude, as it affects navigation systems, communication systems and the quality of ice imagery information
   — remoteness and possible lack of accurate and complete hydrographic data and information, reduced availability of navigational aids and seamarks with increased potential for groundings compounded by remoteness, limited readily deployable SAR facilities, delays in emergency response and limited communications capability, with the potential to affect incident response
   — potential lack of ship crew experience in polar operations, with potential for human error
   — potential lack of suitable emergency response equipment, with the potential for limiting the effectiveness of mitigation measures
   — rapidly changing and severe weather conditions, with the potential for escalation of incidents
   — the environment with respect to sensitivity to harmful substances and other environmental impacts and its need for longer restoration
   — additional hazards, if identified.
4.1.4 The risk level within polar waters may differ depending on the geographical location, time of the year with respect to daylight, ice-coverage, etc. Thus, the mitigating measures required to address the above specific hazards may vary within polar waters and may be different in Arctic and Antarctic waters.

4.2 Risk matrix

The risk matrix, as described by Figure 1 and Figure 2, can be used to identify areas where measures and risk mitigating actions shall be taken.

Mitigating measures shall be taken to reduce the risks if categorized as high or extremely high. Both existing and new introduced measures for risk mitigating shall be included in the PWOM.

For risk categorized as moderate or lower, no additional actions are required to be taken.

As an example, Figure 1 and Figure 2 show an acceptable method by which risk related to each hazard may be estimated.
Figure 1 Definition of frequencies, consequences and risk categories
Table 5 Polar(C) Polar water operational manual (PWOM) content

<table>
<thead>
<tr>
<th>Identified Hazards</th>
<th>Before measures</th>
<th>Mitigating measures</th>
<th>After measures</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>F</td>
<td>C</td>
<td>R</td>
</tr>
<tr>
<td>Loss of stability due to ice accretion</td>
<td>2</td>
<td>5</td>
<td>10</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>High latitude</td>
<td>5</td>
<td>4</td>
<td>20</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>icing and freezing of fire monitor</td>
<td>5</td>
<td>5</td>
<td>25</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Etc.</td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

Figure 2 Example of risk assessment table

5 Polar water operational manual

Table 5 Polar(C) Polar water operational manual (PWOM) content

<table>
<thead>
<tr>
<th>General regulations</th>
<th>Guidelines</th>
</tr>
</thead>
<tbody>
<tr>
<td>.1 The PWOM shall include information on the ship-specific capabilities and limitations in relation to the assessment required under [4].</td>
<td>.1 The manual should be a ship-specific decision-making support document for onboard use for ships operating in polar waters. A PWOM fit for purpose may be achieved following the PWOM template proposed in Annex I.</td>
</tr>
<tr>
<td>General regulations</td>
<td>Guidelines</td>
</tr>
<tr>
<td>---------------------</td>
<td>------------</td>
</tr>
<tr>
<td>.1 Voyage planning to avoid ice and/or temperatures that exceed the ship's design capabilities or limitations.</td>
<td>.1 The PWOM should provide plans and procedures for the intended voyage for avoiding encountering temperatures and/or ice conditions colder than the specified MDLT for the area of operation that exceed the ship's design capabilities or limitations.</td>
</tr>
<tr>
<td>.2 Arrangements for receiving forecasts of the environmental conditions.</td>
<td>.1 Sources for receiving meteorological and ice information, such as access to meteorological institutes home pages and/or Navtex meteorological warnings and forecasts should be listed in the PWOM. These sources should cover, at least, warnings about: — wind — freezing spray — air temperature — and ice drift.</td>
</tr>
<tr>
<td>.3 Means of addressing any limitations of the hydrographic, meteorological and navigational information available.</td>
<td>.1 Limited access to hydrographic, meteorological and navigational information due to lack of coverage, high latitude and/or temperature should be addressed in the PWOM and alternative means to cover the needs should be detailed in the PWOM as applicable.</td>
</tr>
<tr>
<td>.4 Operation of equipment required by IMO Polar Code.</td>
<td>.1 The PWOM should include operational instructions and procedures for safe and proper use of different equipment onboard and to ensure proper functionality of different system, taking in consideration the limitations that may be imposed by low temperature, icing sea ice and/or high latitude, as applicable.</td>
</tr>
<tr>
<td>.5 Implementation of special measures to maintain equipment and system functionality under low temperatures, topside icing and the presence of sea ice, as applicable.</td>
<td></td>
</tr>
</tbody>
</table>
### General regulations

<table>
<thead>
<tr>
<th>Guidelines</th>
</tr>
</thead>
<tbody>
<tr>
<td>.3 The PWOM shall include risk-based procedures to be followed for contacting emergency response providers for salvage, search and rescue (SAR), spill response, etc., as applicable.</td>
</tr>
<tr>
<td>.4 The PWOM shall include risk-based procedures for monitoring and maintaining safety during operations in ice, as applicable, including any requirements for escort operations or icebreaker assistance. Different operational limitations may apply depending on whether the ship is operating independently or with icebreaker escort. Where appropriate, the PWOM should specify both options.</td>
</tr>
<tr>
<td>.5 Ice conditions</td>
</tr>
<tr>
<td>.6 The PWOM shall contain, where applicable, the methodology used to determine capabilities and limitations in ice.</td>
</tr>
</tbody>
</table>

### Specific regulations

<table>
<thead>
<tr>
<th>Guidelines</th>
</tr>
</thead>
<tbody>
<tr>
<td>.1 Ice free waters</td>
</tr>
<tr>
<td>.2 Open waters</td>
</tr>
</tbody>
</table>

### Guidelines

| .1 In the case of an incident, the PWOM should address resource available for salvage, search and rescue (SAR), spill response, etc., and should include procedures to be followed for mitigating the consequences taking in consideration the following factors: |
| .1 For ice classed vessels planning to operate in other ice conditions, proper crew training according to regulation, see [12.1], should be in place together with the use of an appropriate decision support system, such as Polaris, the Canada's Arctic Ice Regime Shipping System, and/or the Russian Ice Certificate as described in the Rules of Navigation on the water area of the Northern Sea Route. |
| .1 The PWOM should provide information on the ice conditions the ship may encounter in the area of operation: |
| .1 The PWOM should include procedures to be followed and available means to be used for ensuring navigation in ice free waters when operating in polar waters. |
| .1 The PWOM should include procedures to be followed and available means to be used for ensuring navigation in open waters when operating in polar waters. |
### Specific regulations

<table>
<thead>
<tr>
<th>Specific regulations</th>
<th>Guidelines</th>
</tr>
</thead>
<tbody>
<tr>
<td>.1 The PWOM should establish the means by which decisions as to whether ice conditions exceed the ship's design limits can be made, taking into account the operational limitations on the polar ship certificate. An appropriate decision support system, such as the Canada's Arctic Ice Regime Shipping System, and/or the Russian Ice Certificate as described in the Rules of Navigation on the water area of the Northern Sea Route, should be used.</td>
<td></td>
</tr>
<tr>
<td>.3 Other ice conditions less severe than those included in categories A and B.</td>
<td></td>
</tr>
</tbody>
</table>

### Table 6 Polar(A/B) Polar water operational manual content

<table>
<thead>
<tr>
<th>Specific regulations</th>
<th>Guidelines</th>
</tr>
</thead>
<tbody>
<tr>
<td>.1 Ice conditions: The PWOM shall include information on the ship specific capabilities and limitations in relation to the assessment required under [4].</td>
<td></td>
</tr>
<tr>
<td>.2 The PWOM shall contain, where applicable, the methodology used to determine capabilities and limitations in ice.</td>
<td></td>
</tr>
<tr>
<td>.1 The PWOM should establish the means by which decisions as to whether ice conditions exceed the ship's design limits can be made, taking into account the operational limitations on the polar ship certificate. An appropriate decision support system, such as the Canada's Arctic Ice Regime Shipping System, and/or the Russian Ice Certificate as described in the Rules of Navigation on the water area of the Northern Sea Route, should be used.</td>
<td></td>
</tr>
<tr>
<td>.2 In the case of ships strengthened in accordance with DNVGL-RU-SHIP Pt.6 Ch.6 Sec.5, the PWOM should include procedures for maintaining life support and ship integrity in the event of prolonged entrapment by ice.</td>
<td></td>
</tr>
</tbody>
</table>
### 6 Subdivision and stability

#### Table 7 Polar(C) Subdivision and stability

<table>
<thead>
<tr>
<th>General regulations</th>
<th>Guidelines</th>
</tr>
</thead>
<tbody>
<tr>
<td>.1 Ships operating in areas and during periods where ice accretion is likely to occur shall be equipped with such means for removing ice as the Administration may require; for example, electrical and pneumatic devices, and/or special tools such as axes or wooden clubs for removing ice from bulwarks, rails and erections.</td>
<td>.1 See [3].</td>
</tr>
<tr>
<td>.2 Information on the icing allowance included in the stability calculations shall be given in the PWOM.</td>
<td>.1 The applied amount of icing allowance should be described in the PWOM, together with information regarding the ship's operational capabilities and limitations with respect to stability. Sketches showing the distribution of icing allowance should be included in the PWOM.</td>
</tr>
<tr>
<td>.3 Ice accretion shall be monitored, and appropriate measures taken to ensure that the ice accretion does not exceed the values given in the PWOM.</td>
<td>.1 The frequency of icing monitoring should be adjusted onboard based on the actual environmental conditions. These procedures should be included clearly in the PWOM with the responsible persons onboard for ice monitoring and for ice fighting. See [3.1]. De-icing actions should start when ice accretion is noted to cover significant decks areas with thickness about 3 cm.</td>
</tr>
</tbody>
</table>

**.1 Stability in intact conditions (IMO Polar Code Part I-A Ch. 4.2.1)**

**.1 Stability in damage conditions (IMO Polar Code Pt. I-A Ch.4 Reg. 4.3.2.2)**

1. The ice damage extents to be assumed when demonstrating compliance with damage stability calculations should be as illustrated in Figure 3.
Figure 3 Ice damage extent

7 Watertight and weathertight integrity

Table 8 Polar(C) Watertight and weathertight integrity

<table>
<thead>
<tr>
<th>General regulations</th>
<th>Guidelines</th>
</tr>
</thead>
<tbody>
<tr>
<td>.1 All closing appliances and doors relevant to watertight and weathertight</td>
<td>.1 For ships operating in areas and during periods where ice accretion is</td>
</tr>
<tr>
<td>integrity of the ship shall be operable.</td>
<td>likely to occur, means shall be provided to remove or prevent ice and snow</td>
</tr>
<tr>
<td></td>
<td>accretion around hatches and doors.</td>
</tr>
<tr>
<td>.1 Watertight and weathertight doors, hatches and closing devices which are</td>
<td>.1 See [3.1]</td>
</tr>
<tr>
<td>not within an habitable environment and require access while at sea shall be</td>
<td></td>
</tr>
<tr>
<td>designed to be operated by personnel wearing heavy winter clothing including</td>
<td></td>
</tr>
<tr>
<td>thick mittens.</td>
<td>.1 Door and hatch handles should be large enough to be operated by personnel</td>
</tr>
<tr>
<td>(IMO Polar Code Pt I-A Ch. 5 Reg.5.3.2.2)</td>
<td>wearing heavy winter clothing and thick mittens.</td>
</tr>
</tbody>
</table>

Hi = min(20% TL; 1.5% or 4.6% of Li)
8 Fire safety and protection

Table 9 Polar(C) Fire safety and protection

<table>
<thead>
<tr>
<th>General regulations</th>
<th>Guidelines</th>
</tr>
</thead>
<tbody>
<tr>
<td>.1 All components of fire safety systems and appliances if installed in exposed positions shall be protected from ice accretion and snow accumulation.</td>
<td>.1 Isolating and pressure/vacuum valves in exposed locations shall be protected from ice accretion and remain accessible at all time.</td>
</tr>
</tbody>
</table>

9 Life-saving appliances and arrangements

9.1 Escape

Table 10 Polar(C) Life-saving appliances and arrangements

<table>
<thead>
<tr>
<th>General regulations</th>
<th>Guidelines</th>
</tr>
</thead>
<tbody>
<tr>
<td>.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.</td>
<td>.1 See [3]</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Specific regulations</th>
<th>Guidelines</th>
</tr>
</thead>
<tbody>
<tr>
<td>.2 Intended to operate in low temperature: Adequacy of embarkation arrangements shall be assessed, having full regard to any effect of persons wearing additional polar clothing.</td>
<td></td>
</tr>
</tbody>
</table>

9.2 Evacuation

Table 11 Polar(C) Life-saving appliances and arrangements

<table>
<thead>
<tr>
<th>General regulations</th>
<th>Guidelines</th>
</tr>
</thead>
<tbody>
<tr>
<td>.1 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.</td>
<td>.1 Davits, cranes and all equipments dedicated for handling life saving appliances should be powered with an independent source of power to the main ship’s source of power.</td>
</tr>
<tr>
<td>Specific regulations</td>
<td>Guidelines</td>
</tr>
<tr>
<td>----------------------</td>
<td>------------</td>
</tr>
<tr>
<td>2 Potential for abandonment onto ice or land: 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.</td>
<td>1 — Quick release drop-lifeboat system should not be used when abandoning the ship in ice covered waters. — Davits or similar means should be used for lowering lifeboats to the ice surface.</td>
</tr>
</tbody>
</table>
## 9.3 Survival

### Table 12 Polar(C) Life-saving appliances and arrangements

<table>
<thead>
<tr>
<th>General regulations</th>
<th>Guidelines</th>
</tr>
</thead>
<tbody>
<tr>
<td>.1 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. (IMO Polar Code Pt. I-A Ch.8 Reg. 8.3.3.3.2)</td>
<td>.1 Means to be included in the personal survival equipment (PSE) should be:</td>
</tr>
<tr>
<td>.2 Personal survival equipment that provide sufficient protection to prevent frostbite of all extremities. (IMO Polar Code Pt. I-A Ch.8 Reg. 8.3.3.3.3)</td>
<td>— protective polar clothing (hat, gloves, socks, face and neck protection)</td>
</tr>
<tr>
<td></td>
<td>— skin protection cream</td>
</tr>
<tr>
<td></td>
<td>— thermal protective aid</td>
</tr>
<tr>
<td></td>
<td>— sunglasses</td>
</tr>
<tr>
<td></td>
<td>— at least two (2) litres of fresh water per person per day. Desalting apparatus or means to melt ice or snow may be considered taking into account the operational assessment and the maximum expected time of rescue. There should be a tank or a container of adequate size to collect water from the desalting apparatus and rainwater collectors</td>
</tr>
<tr>
<td></td>
<td>— drinking mug</td>
</tr>
<tr>
<td></td>
<td>— emergency food ratio providing a minimum of 5,000 kJ (1,195 kcal) per person per day which should be increased as necessary taking into account the operational assessment and the maximum expected time of rescue</td>
</tr>
<tr>
<td></td>
<td>— weatherproof carrying bags. The PSE shall be packet in individual bags to be stowed in easily accessible locations.</td>
</tr>
<tr>
<td></td>
<td>(MSC.1/Circ.1614, 26 June 2019)</td>
</tr>
<tr>
<td></td>
<td>Guidance note:</td>
</tr>
<tr>
<td></td>
<td>PSE bags are recommended to be located in the same location as lifejackets, at the assembly or embarkation stations.</td>
</tr>
</tbody>
</table>

---e-n-d---o-f---g-u-i-

---a-n-c-e---n-o-t-e---
### General regulations

<p>| | |</p>
<table>
<thead>
<tr>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>.3 Taking into account the presence of any hazards identified, survival craft shall provide a habitable environment for all persons on board, for the maximum expected time of rescue. (IMO Polar Code Pt. I-A Ch.8 Reg. 8.2.3.3)</td>
<td>.1 Ventilation that prevent exposure to a long-term CO₂ concentration of more than 5,000 ppm for the maximum expected time of rescue should be provided. The ventilation should be considered in context with heating requirements to achieve a habitable temperature in the survival craft.</td>
</tr>
</tbody>
</table>

### Specific regulations

<p>| | |</p>
<table>
<thead>
<tr>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>.4 Intended to operate in low air temperatures.</td>
<td>.1 In the survival craft, the combination of personal survival equipment, ventilation, insulation and heating means, if provided, should be capable of maintaining a habitable inside air temperature when the outside air temperature is equal to the PST. All cold surfaces should be insulated, in particular the surfaces in direct contact with the persons, e.g. seats. (MSC.1/Circ.1614, 26 June 2019)</td>
</tr>
</tbody>
</table>

<p>| | |</p>
<table>
<thead>
<tr>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>.2 Installed heating systems, if provided, and their power sources should be capable of operation during the maximum expected time of rescue. (MSC.1/Circ.1614, 26 June 2019)</td>
<td>.3 all persons, when in Liferafts, should be wearing insulated immersion suits instead of thermal protective aids. (MSC.1/Circ.1614, 26 June 2019)</td>
</tr>
</tbody>
</table>

<p>| | |</p>
<table>
<thead>
<tr>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>.1 Taking into account the presence of any hazards identified, resources should be provided to support survival following abandoning ship, whether to the water, to ice or to land, for the maximum expected time of rescue. (IMO Polar Code Pt. I-A Ch.8 Reg. 8.2.3.3)</td>
<td></td>
</tr>
</tbody>
</table>

<p>| | |</p>
<table>
<thead>
<tr>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>.3 all persons, when in Liferafts, should be wearing insulated immersion suits instead of thermal protective aids. (MSC.1/Circ.1614, 26 June 2019)</td>
<td></td>
</tr>
<tr>
<td>Specific regulations</td>
<td>Guidelines</td>
</tr>
<tr>
<td>----------------------</td>
<td>------------</td>
</tr>
<tr>
<td></td>
<td>.4 Survival craft and containers for group survival equipment in their stowed position should have means to mitigate the freezing of drinking water supplies. (MSC.1/Circ.1614, 26 June 2019)</td>
</tr>
<tr>
<td></td>
<td>.5 In order to avoid exposure to cold air, toilet equipment should be provided inside the survival craft. (MSC.1/Circ.1614, 26 June 2019)</td>
</tr>
<tr>
<td>Specific regulations</td>
<td>Guidelines</td>
</tr>
<tr>
<td>----------------------</td>
<td>------------</td>
</tr>
<tr>
<td>.5 Potential for abandonment onto ice or land.</td>
<td>.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.</td>
</tr>
<tr>
<td>.1 When considering resources sufficient for number of persons, to be included in the group survival equipment, the following should be taken into account:</td>
<td></td>
</tr>
<tr>
<td>— group survival equipments should be sorted in bags of maximum 25 kg per bag</td>
<td></td>
</tr>
<tr>
<td>— tents or storm shelters. When abandonment onto ice, liferafts may be used as shelter as applicable</td>
<td></td>
</tr>
<tr>
<td>— thermal protective aids or similar</td>
<td></td>
</tr>
<tr>
<td>— sleeping bags</td>
<td></td>
</tr>
<tr>
<td>— foam sleeping mats</td>
<td></td>
</tr>
<tr>
<td>— at least two (2) shovels</td>
<td></td>
</tr>
<tr>
<td>— sanitation</td>
<td></td>
</tr>
<tr>
<td>— stove and fuel</td>
<td></td>
</tr>
<tr>
<td>— emergency food</td>
<td></td>
</tr>
<tr>
<td>— flashlights</td>
<td></td>
</tr>
<tr>
<td>— waterproof and wind proof matches</td>
<td></td>
</tr>
<tr>
<td>— water containers and water purification tablets.</td>
<td></td>
</tr>
</tbody>
</table>
.2 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.

.3 Passengers shall be instructed in the use of the personal survival equipment and the action to take in an emergency.

(IMO Polar Code Pt. I-A Ch.8 Reg. 8.3.3.3.4 and .6)

.4 The crew shall be trained in the use of the personal survival equipment and group survival equipment.

(IMO Polar Code Pt. I-A Ch.8 Reg. 8.3.3.3.7)

.1 Procedures and instructions should be established and made clear to persons onboard for safe use of group survival equipment, GSE. Instructions should include, among others:

- location of GSE
- responsible persons for handling and carrying the GSE
- list of components making the GSE
- instruction on how to use the GSE during the expected time of rescue.

.1 The crew should be made familiar with the use of personal and group survival equipment, PSE and GSE, by running regular demonstrations and training sessions onboard.
10 Safety of navigation

Table 13 Polar(C) Life-saving appliances and arrangements

<table>
<thead>
<tr>
<th>General regulations</th>
<th>Guidelines</th>
</tr>
</thead>
<tbody>
<tr>
<td>.1 Nautical information Ships shall have means of receiving and displaying current information on ice conditions in the area of operation.</td>
<td>.1 The PWOM should set out means and resources for ice detection and ice forecast relevant within the area of operation for identification of ice patterns/regimes that may exceed the ships capabilities. If means with ice detection capability are provided onboard, the PWOM should include or refer to guidance on how this technology should be used to identify ice floes, how to be tuned to be the most effective, instructions on how to interpret ice imagery information, etc.</td>
</tr>
<tr>
<td>.1 Navigational equipment functionality: 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.</td>
<td>.1 See [3].</td>
</tr>
<tr>
<td>.5 High latitude: Systems for providing reference headings and position fixing shall be suitable for the intended areas. (IMO Polar Code Pt. I-A Ch.9 Req. 9.3.2.2.2)</td>
<td>.1 As alternative to GNSS, fibre optic gyros have been proven to function up to latitudes of 88 degrees.</td>
</tr>
</tbody>
</table>

11 Communication

Table 14 Survival craft and rescue boat communications capabilities

<table>
<thead>
<tr>
<th>General regulations</th>
<th>Guidelines</th>
</tr>
</thead>
<tbody>
<tr>
<td>.1 All two-way portable radio communication equipment shall be operable at the polar service temperature.</td>
<td>.1 Basically, exposed radio communication shall be certified down to PST. If not, operational procedures that ensure proper functionality during the maximum expected rescue time, minimum 5 days, may be accepted as an alternative, such as: — thermal protection — heating source in the survival craft.</td>
</tr>
<tr>
<td>.1 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.</td>
<td>.1 Procedures for maintaining enough battery capacity for all mandatory communication equipment for use in survival craft, including liferafts and rescue boats, during the maximum expected time of rescue, should be included in the PWOM.</td>
</tr>
</tbody>
</table>
## 12 Manning and training

### 12.1 Regulations

**Table 15 Training certificate requirements in accordance with chapter V of the STCW Convention and the STCW Code**

<table>
<thead>
<tr>
<th>Ice conditions</th>
<th>Ship types</th>
<th>Regulations</th>
<th>Guidelines</th>
</tr>
</thead>
<tbody>
<tr>
<td>Ice free</td>
<td>All ship types</td>
<td>Not applicable.</td>
<td>Not applicable.</td>
</tr>
<tr>
<td>Open waters</td>
<td>Other</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>Passenger ships</td>
<td>Certificate in basic training for master, chief mate and officers in charge of a navigational watch.</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Tankers</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>
| Other ice conditions less severe than those included in categories A and B. 1) | All ship types      | Certificate in advanced training for master and chief mate. Basic training for officers in charge of a navigational watch. | Approved basic training course is a prerequisite to advanced course training. Approved seagoing services should be completed:  
  — on board a ship operating in polar waters or equivalent seagoing service  
  — in the deck department at the management level or while performing watchkeeping duties in an operational level  
  — for period of at least 2 months in total during the preceding 5 years. Approved advanced training course should be completed. |
| Other ice conditions             |                     |                                                                             |                                                                           |

**Notes:**

1) Basic training for master, chief mate and officers in charge of a navigational watch may be acceptable provided a person(s) other than the master, chief mate or officers of the navigational watch with advance training is available onboard:

  — this person(s) shall be qualified and certified in accordance with regulation II/2 of the STCW Convention and section A-II/2 of the STCW Code and meets the advance training requirements noted in this table
  — while operating in polar waters the ship has sufficient number of persons meeting the appropriate training requirements for polar waters to cover all watches
  — this person(s) is subject to the Administration’s minimum hours of rest requirements at all times
  — the use of a person other than the officer of the navigational watch to satisfy the requirements for training does not relieve the master or officer of the navigational watch from their duties and obligations for the safety of the ship.
12.1.1 Every crew member shall be made familiar with the procedures and equipment contained or referenced in the PWOM relevant to their assigned duties.

12.1.2 Certificate in basic and advanced training
A certificate of proficiency is issued to seafarers who meet the standards in section A-V/4, paragraph 1, of the STCW Code.
This shall be renewed at least every five years for continued service.
The requirements for these certificates are as shown in Table 14 and Table 15.

12.1.3 Responsibilities

12.1.3.1 The company is responsible for ensuring that the crew is certified in accordance with the requirements in STCW, and that every crew member is made familiar with the procedures and equipment contained or referenced in the PWOM relevant to their assigned duties.

12.1.3.2 Flag administrations are responsible for:
— approving training courses
— defining approved or equivalent sea going service
— determining that a seafarer meets the required standard of competence.

12.1.3.3 Port state administrations may inspect ships to verify compliance (port state control).

12.1.4 Some coastal states have additional manning and training requirements for ships in their Arctic waters (such as Canada, Greenland and Russia). If planning a voyage to the Arctic, you should consult the relevant coastal states for national regulations that will apply.

Guidance note:
For more detailed crew performance elements and required competencies of the responsible deck officers, DNVGL-ST-0017 may be used as a best practice and reference for standard training, familiarisation and assessment of crew in a related role onboard or onshore, regardless of the exact geographical location and applicability of the IMO Polar Code.

---e-n-d---o-f---g-u-i-d-a-n-c-e---n-o-t-e---
APPENDIX A POLAR WATER OPERATIONAL MANUAL

1 Example of polar water operational manual

Guidance note:

1) All contents included under guidelines are not included in the PWOM unless found relevant for the area and period of operation in polar waters.

2) Items included in this example are not required to be included in the PWOM unless found relevant for the area and period of operation in polar waters.

3) For the PWOM to be a valuable and useful document on board, it should include procedures to be followed in the following situations:
   — in normal operations to avoid encountering conditions that exceed ship’s capabilities
   — in the event of incidents
   — in the event where conditions exceeding the ship’s capabilities are encountered
   — and when using icebreaker assistance, as applicable.

---end---of---guidance---note---
# Appendix A
## IMO Polar Code
### Edition July 2020

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1 SHIPS PARTICULARS

2 INTRODUCTION TO POLAR OPERATIONS

Guidance note:
The introduction should contain general information and definitions of all terms relevant for polar waters navigation. It should also contain possible hazards relevant for the area and period of operations in polar waters.

---End of guidance note---

2.1 Polar water hazards

Guidance note:
This part should be a result of the outcome from the operational assessment and should contain all the identified risk which require mitigating actions and procedures.

---End of guidance note---

<table>
<thead>
<tr>
<th>Hazards</th>
<th>Comments</th>
</tr>
</thead>
<tbody>
<tr>
<td>Ice</td>
<td></td>
</tr>
<tr>
<td>Icing</td>
<td></td>
</tr>
<tr>
<td>Low air temperature</td>
<td></td>
</tr>
<tr>
<td>Extended period of darkness</td>
<td></td>
</tr>
<tr>
<td>High latitude</td>
<td></td>
</tr>
<tr>
<td>Lack of crew experience</td>
<td></td>
</tr>
<tr>
<td>Potential for abandoning to ice or to land</td>
<td></td>
</tr>
<tr>
<td>Additional hazards</td>
<td></td>
</tr>
</tbody>
</table>

3 POLAR OPERATING CAPABILITIES AND LIMITATIONS

3.1 Polar operating profile

Guidance note:
If not mentioned otherwise the following needs to be addressed:

- MDIT
- PST as found applicable
Appendix A

---

3.2 Ships specific capabilities and limitations

Guidance note:

Capabilities and limitations part should include all ships specifics that may be relevant for polar water navigation. This part should be considered as the basis for further voyage planning and incident preparedness.

---

3.2.1 Navigation and communication

Guidance note:

Reference to be made to the communication and equipment lists in appendix A and B

---

3.2.2 Operation in ice

Guidance note:

The following should be discussed as found applicable:

- Ice class notation
- Crew experience and training if required
- Ice clearance of sea suction for sea water supplies for machinery
- Ice clearance of sea suction for water-based firefighting system
- Protection of under hull projected sensors

---

3.2.3 Operation in low air temperature

Guidance note:

The following should be discussed as found applicable:

- Hull structure material
Appendix A

IMO Polar Code operational requirements

---

3.2.4 Operation in icing conditions

Guidance note:
The following should be discussed as found applicable:

- Intact stability
- Information on the icing allowance included in the stability calculation
- Damage stability for category A and B
- Susceptibility to ice accretion for:
  - Matches and doors
  - Machinery installations and associated equipment
  - Fire safety system and associated equipment
  - Escape routes
  - Muster stations
  - Embarkation areas
  - Survival crafts
  - Life-saving launching appliances
  - Antennas required for navigation and communication

Means for ice-removal list:

<table>
<thead>
<tr>
<th>Hazard</th>
<th>Means</th>
<th>Quantity</th>
<th>Location</th>
</tr>
</thead>
<tbody>
<tr>
<td>Snow and ice accretion</td>
<td>Hammers</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>Axes</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>Crowbars</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>Shovels</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>Electrical devices</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>Pneumatic devices</td>
<td></td>
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<tr>
<td></td>
<td>Other...</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

---

DNV GL AS
### 3.2.5 Operation in high latitudes

**Guidance note:**

The following should be discussed as found applicable:

- Operability of all navigation and communication equipment and alternative means for these affected by high latitudes
- GNSS compass or equivalent

---

### 3.2.6 Life-saving appliances

**Guidance note:**

The following should be included as found applicable:

- **Life-saving appliances list**

<table>
<thead>
<tr>
<th>Hazards</th>
<th>Lifesaving appliances</th>
<th>Quantity</th>
<th>Location</th>
</tr>
</thead>
<tbody>
<tr>
<td>Immersion suits</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Additional food &amp; water for at least 5 rescue days</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Rescue boats</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Life raft</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Lifeboat</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Per PSR for at least 5 days</td>
<td>Hat</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>Gloves</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>Socks</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>Mask</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>Mitten</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>Skin protection cream</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>Thermal underwear</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>Sunglasses</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>Vehicle</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>Mug</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>Pointer</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>Emergency survival guide</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>Camping kit</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>Etc...</td>
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<td></td>
</tr>
</tbody>
</table>
### Appendix A

#### Class guideline — DNVGL-CG-0308. Edition July 2020

### IMO Polar Code operational requirements

<table>
<thead>
<tr>
<th>Requirement to be on board</th>
<th>GSK for at least 5 days</th>
<th>Shelter tents</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td>Thermal protective aids or similar</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Sleeping bags</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Sleeping mats</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Shovels</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Sanitation</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Store and fuel</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Emergency food</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Flashlights</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Weather/ and waterproof matches</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Whistle</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Signal mirror</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Water containers</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Spare set of PFA</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Group survival equipment container</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Etc...</td>
</tr>
</tbody>
</table>

- Independent source of power for devices dedicated to safe launching of survival equipment

#### 3.2.7 Operation in extended periods of darkness

**Guidance note:**

The following should be discussed as found applicable:

- Searchlights, including coverage, capacity and arrangement
- Lifeboat searchlight

---

### 4 VOYAGE PLANNING

#### 4.1 Strategic planning

#### 4.2 Meteorological, hydrographic and navigation information
4.2.1 Meteorological and hydrographic information

4.3 Operation in ice

4.3.1 Means for ice imagery and forecast

4.3.2 Decision support system

Guidance note:

The PoWOM shall include method by which decisions as to whether ice conditions exceed the ship's design limits should be made, this method may be one of the following:

- Polars - IMO MSC.1/Circ.1319 6 June 2016
- The Russian Ice Certificate as described in the Rules of Navigation on the water area of the Northern Sea Route

4.3.3 Maneuvering in ice

4.3.4 Adverse ice condition

Guidance note:

Measures to be taken in the event of encountering ice conditions that exceed ships design capability

4.4 Operation in low air temperatures

4.4.1 Equipment functionality

4.4.2 Personnel health and safety in cold climate

4.4.3 Adverse temperatures

Guidance note:

Measures to be taken in the event of encountering temperature conditions that exceed ships design capability

4.5 Operations in icing conditions

4.5.1 Icing prediction

4.5.2 Icing prevention

4.5.3 De-icing procedures

4.5.4 Adverse ice condition

Guidance note:
4.6 Operation in limited visibility and darkness

4.7 Operation in high latitudes

Guidance note:

All navigational and communication equipment for normal operation and operation in polar waters whose functionality may be affected by high latitude, shall be listed with the corresponding alternatives and/or procedures for mitigating the needs.

4.8 Pollution prevention measures

Guidance note:

The following should be included as found applicable:

4.8.1 Prevention of pollution by oil
4.8.2 Pollution by noxious liquid substances in bulk
4.8.3 Prevention of pollution by sewage
4.8.4 Prevention of pollution by garbage

5 INCIDENTS PREPARNESS

Guidance note:

The following should be discussed as found applicable:
5.1 Shipboard damage control

5.2 Maintaining watertight integrity and stability

5.3 Firefighting

5.4 Escape and evacuation

5.5 Preparations for abandonment

5.6 Evacuation to sea

5.7 Evacuation to land

5.8 Evacuation to sea ice
  - Safe deployment of survival equipment in ice infested waters
  - Survival craft and launching appliances capacity to accommodate the additional equipment

5.9 Maintaining rescue communications
  - Battery capacity for all mandatory communication equipment for use in survival craft, including icecraft and rescue boats, during the maximum expected time of rescue

5.10 Rescue and assistance

5.11 Search and rescue

5.12 Salvage

5.13 Environmental response

5.14 Prolonged entrapment in ice

---end-of-guidance-note---

6 SPECIAL OPERATIONS

Guidance note:
The following should be included as found applicable:

6.1 Joint operations

6.1.1 Icebreaker escort / convoy operations

6.1.2 Ice management operations

6.1.3 Helicopter operations

---end-of-guidance-note---
## References

### Appendix A

#### Table 16 Ships communication equipment list

<table>
<thead>
<tr>
<th>Hazards</th>
<th>Equipment</th>
<th>Quantity</th>
<th>Location</th>
<th>Risk of icing and/or low temperatures Y/N</th>
<th>Temperature range of operation</th>
</tr>
</thead>
<tbody>
<tr>
<td>Polar waters / high latitudes</td>
<td>Ship-to-ship 1)</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>Ship-to-shore 2)</td>
<td></td>
<td></td>
<td></td>
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</tr>
<tr>
<td></td>
<td>SAR communication 3)</td>
<td></td>
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<tr>
<td></td>
<td>Two-way on-scene communication 3)</td>
<td></td>
<td></td>
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<tr>
<td></td>
<td>TMAS transceiver 3)</td>
<td></td>
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<tr>
<td></td>
<td>Transceiver for ice &amp; weather information 3)</td>
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</tr>
<tr>
<td>Other available equipment</td>
<td></td>
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</tbody>
</table>

**Guidance Notes:**

1. SOLAS VI/SMDS radio equipment for applicable sea area is considered meeting this requirement.
2. SOLAS RNLI & SOLAS IV radio equipment are considered meeting this requirement.
3. Fixed or portable aeronautical VHF radio operating on 121.5 MHz and 123.1 MHz.
4. Inmarsat-F/FBB or VSAT or Inmarsat or other systems that provide both 3-way voice communication and data communication. Combination of different systems to ensure both coverage and desired functionality when sailing in high latitudes may be needed.
5. Inmarsat-F/FBB or VSAT or Inmarsat or other systems, Combination of different systems to ensure both coverage and desired functionality when sailing in high latitudes may be needed.
## Appendix B

### Table 13 Survival craft and rescue boats communication equipment list

<table>
<thead>
<tr>
<th>Hazards</th>
<th>Equipment</th>
<th>Quantity</th>
<th>Location</th>
<th>Risk of Icing and/or low temperatures Y/N</th>
<th>Temperature range of operation</th>
</tr>
</thead>
<tbody>
<tr>
<td>Polar water, general</td>
<td>Additional batteries for VHFs, SARTs, etc. for at least 5 rescue days</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Darkness</td>
<td>Searchlights for lifeboats 6)</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Low temperature, rescue and lifeboats</td>
<td>Distress alerting 1)</td>
<td></td>
<td></td>
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<tr>
<td></td>
<td>Signal for location 2)</td>
<td></td>
<td></td>
<td></td>
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</tr>
<tr>
<td></td>
<td>On-scene communication 3)</td>
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<td></td>
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<td></td>
</tr>
<tr>
<td></td>
<td>Signal for location 4)</td>
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<td></td>
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</tr>
<tr>
<td></td>
<td>On-scene communication 5)</td>
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<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>All survival crafts</td>
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<td></td>
<td></td>
</tr>
<tr>
<td>Other available equipment</td>
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</tr>
</tbody>
</table>

**Notes:**

1. EPIRB may be used to comply with this requirement if it is documented that the EPIRB is functional at the defined PST and the operation procedure clearly describes how/when an EPIRB should be activated. In order to avoid confusion in search and rescue operations due to multiple EPIRB activation, the operation procedure shall also include instructions on optimal use of the available EPIRB units. Note that it is not required to transmit distress alerting signal continuously during the maximum expected time of rescue (at least 5 days).
2. Every lifeboat and rescue boat shall carry minimum 1 Radar Transponder (SART) or minimum 1 AIS-SART. It is documented that the SART or AIS-SART is available for operation during maximum expected rescue time (min. 5 days). An operation procedure for how/when to activate SART/AIS-SART optimally must be described as it will also justify the quantity of SART/AIS-SART provided on a lifeboat/rescue boat. It must be documented that the SART or AIS-SART is functional at the defined PST.
3. To comply with this requirement, every lifeboat and every rescue boat shall carry each 1 unit of portable VHF radio apparatus with additional sealed battery. The requirement of availability for operation during maximum expected rescue time (min. 5 days) is also considered met in this relation. It must be documented that the portable radio is functional at the defined PST.
4. Every (inflatable) raft shall be provided with SART (or) AIS-SART as described in 2).
5. Every (inflatable) raft shall be provided with portable VHF radio apparatus as described in 2).
6. Lifeboat searchlight with source of power with capacity enough for continuous use in ice-infested waters.
CHANGES – HISTORIC

July 2019 edition

There are currently no historical changes for this document.
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DNV GL is a global quality assurance and risk management company. Driven by our purpose of safeguarding life, property and the environment, we enable our customers to advance the safety and sustainability of their business. We provide classification, technical assurance, software and independent expert advisory services to the maritime, oil & gas, power and renewables industries. We also provide certification, supply chain and data management services to customers across a wide range of industries. Operating in more than 100 countries, our experts are dedicated to helping customers make the world safer, smarter and greener.

SAFER, SMARTER, GREENER