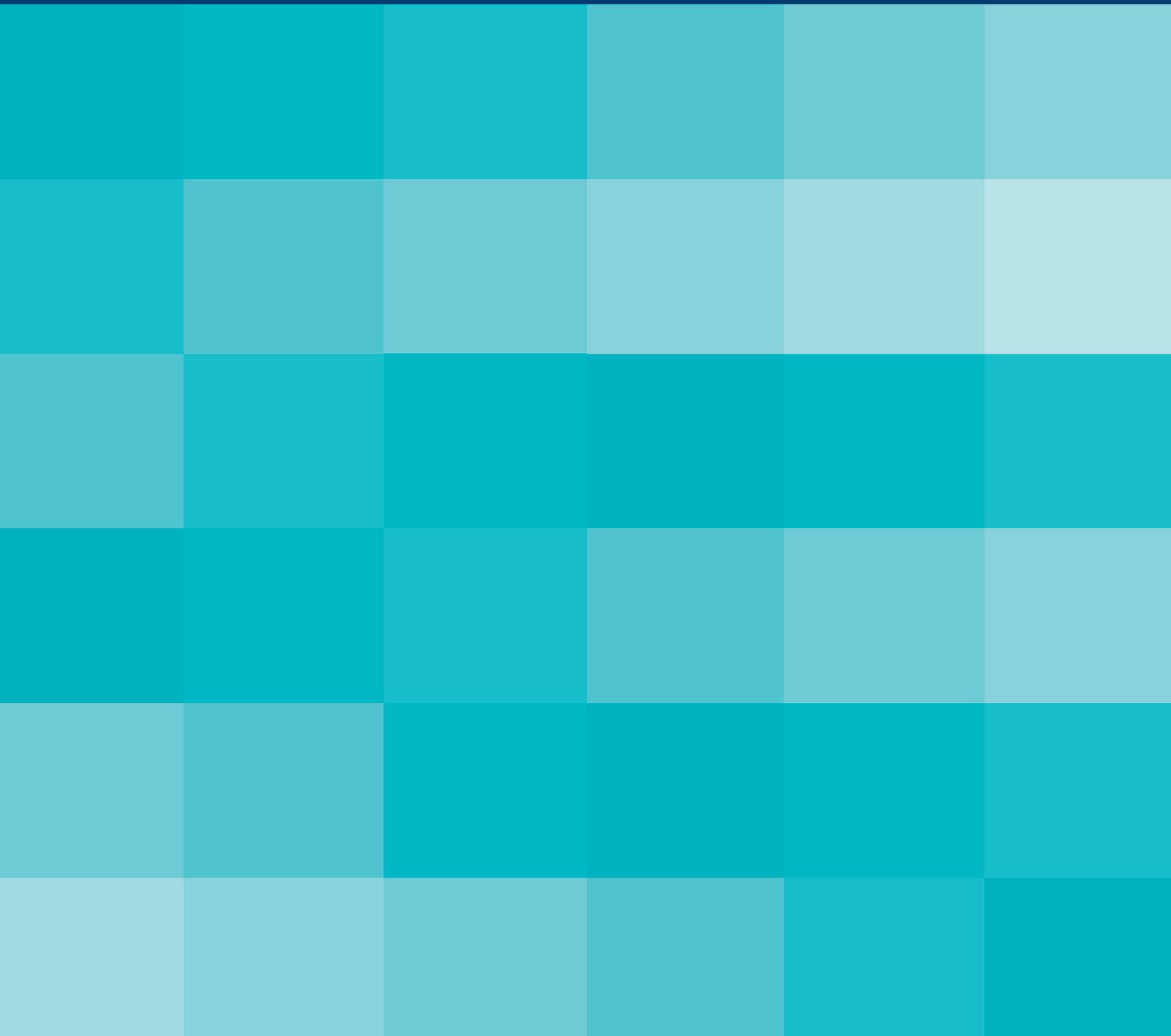


The International Code for Ships Operating in Polar Waters

A regulatory interpretation guide

A Lloyd's Register guidance document



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Introduction

With new operators starting to explore the polar regions, and following several incidents in recent years, there has been a drive towards increasing the safety of vessel design and operations.

Furthermore, an increased perception that there is easier access to these regions and that they are more navigable, has increased shipping traffic. This has been a catalyst for protecting the sensitive polar environment from the effects of shipping.

The Polar Code has been on the IMO's agenda since the 1990s, initially as non-mandatory guidance. Now, in response to these industry drivers, it has been developed and become mandatory.

The Polar Code comprises a set of additions to the International Convention for the Safety of Life at Sea (SOLAS) and the International Convention for the Prevention of Pollution from Ships (MARPOL) that is implemented through amendments to both conventions.

It forms two corresponding parts. Part I covers the safe design and operation of ships and forms an add-on to the SOLAS requirements. Part II considers the environmental protection of the polar regions and is implemented through amendments to MARPOL Annexes I, II, IV and V.

Regardless of flag, the Polar Code applies to all ships carrying SOLAS certification that intend to operate in polar regions. Part I applies to all new vessels whose keel is laid on or after 1 January 2017, and to in-service vessels from their first intermediate or renewal survey after 1 January 2018. Part II applies to all vessels operating in Polar waters from 1 January 2017.

NB: The Polar Code is very different to most existing regulation because it is, in part, goal-based rather than prescriptive. This means that it will describe an expected result but not tell you how to achieve it. You are expected to comply using a suitable combination of processes, procedures, equipment and systems which will depend on your profile. You cannot use a standardised approach to meeting this regulation or order a compliant ship 'off the shelf'.

The Code has varying levels of requirements according to the profile of the vessel. The temperature and the expected ice conditions that the vessel will operate in will determine the scope and applicability of the requirements.

About this guide

This guide contains Lloyd's Register's (LR) commentary on the Polar Code and what the requirements mean for you as a shipowner or operator.

The full text of the Code is reproduced on the right-hand pages. Our commentary appears on the corresponding left-hand page. Where we have provided comments against different paragraphs on the same page these are colour coded for ease of reference between the commentary and the Code text.

Four key 'important concepts' within the Code are explained at the beginning of the document on pages 6 to 8, and these are referred to at points throughout the commentary.

Important concepts

Ship Categories

Part I-A, Introduction, Paragraph 2.1, 2.2, 2.3

The Polar Code uses ship Categories as a marker in the Code to identify application of certain requirements based on anticipated hazards encountered for the expected operating environment. Three ship Categories are defined:

- Category A ship means a ship designed for operation in polar waters in at least medium first-year ice, which may include old ice inclusions.
- Category B ship means a ship not included in Category A, designed for operation in polar waters in at least thin first-year ice, which may include old ice inclusions.
- Category C ship means a ship designed to operate in open water or in ice conditions less severe than those included in Categories A and B.

The ship Category is a reflection of the expected severity of ice conditions that the ship is anticipated to operate in. The definition in the Introduction part of the Code uses general ice descriptors based on World Meteorological Organization (WMO) nomenclature.

The ship Category is relevant for:

- Requirements for strength of hull structure for operation in ice (Part I, [paragraph 3.3.2](#))
- Requirements for strength of propulsion machinery for operation in ice (Part I, [paragraph 6.3.3](#))
- Requirements concerning damage stability (due to ice impact) (Part I, [paragraph 4.3.2](#))
- Requirements for enclosed bridge wings (Part I, [paragraph 9.3.2.1.4.2](#))
- Requirements for oil cargo tank protection (Part II, [paragraphs 1.2.1, 1.2.2 & 1.2.3](#))
- Requirements for oil residue and oily bilge water holding tank protection (Part II, [paragraph 1.2.3](#))
- Requirements for carriage of noxious liquid substances (NLS) (Part II, [paragraph 2.1.3](#))
- Requirements for discharge of sewage (Part II, [paragraphs 4.2.2 & 4.2.3](#))

The principal intention of the ship Categories is to group ships by their ability to operate safely in ice – ships intended to operate in more severe conditions (Category A and B ships) having additional requirements to mitigate the perceived additional hazards. Relating ice class to the descriptors used in the Introduction should be guided by further clarity of the meaning of the ship Categories described in Part I, Chapter 3 and Chapter 6 of the Code:

Category A: Part I, paragraph 3.3.2.1 of the Code cross refers, through a foot note, to the IACS Polar Classes. As such, Category A ships should be considered ships which are IACS Polar Class PC5 or above (PC4, PC3, PC2, PC1) or ships with an equivalent level of safety.

Category B: Part I, paragraph 3.3.2.2 of the Code, cross refers, through a foot note, to the IACS Polar Classes. As such, Category B ships should be considered ship which are IACS Polar Class PC7 or PC6 or ships with an equivalent level of safety.

Category C: are ships which are ice strengthened and non-ice strengthened ships which do not fall into Category A or B. As such, ships of Category C may, or may not have an ice class, depending on the ice conditions that they are anticipated to operate in (see commentary on paragraph 1.3.7 of the Code).

It is to be noted that the ship Category is a result of the ice class assigned to the ship and not vice versa.

Polar Service Temperature

Part I-A, Definitions, 1.2.11

The Polar Service Temperature (PST), which is effectively a design temperature, is used in the Code to set functional performance requirements for equipment and systems, and to identify when a ship is intended to operate in low air temperature.

PST means 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 Mean Daily Low Temperature (MDLT) for the intended area and season of operation in polar waters.

Ships intending to operate in areas where the lowest MDLT for the season of operation is -10°C or above are not considered as a “ship intended to operate in low air temperature”. As such the low temperature functional requirements in the Polar Code do not apply. Ships which operate in areas where, for the season of operation, the lowest MDLT is below -10°C are considered as a “ship intended to operate in low air temperature” and are required to have a PST assigned. As the PST must be 10°C below the lowest MDLT, the highest PST assigned will be -21°C. Ships cannot be assigned PSTs above this.

Operational Limitations

The Code introduces a concept of Operational Limitations, which are to be included on the Polar Ship Certificate (PSC). The Code recognises that within the polar regions there are significant variations in terms of hazards to shipping, primarily associated with variability of environmental conditions (such as low temperature, or the presence of sea ice) but also associated with remoteness and latitude. Operational limitations are set for each ship for:

- ice conditions
- temperature
- latitude

In addition the Code requires a maximum ‘Expected Time to Rescue’ (ETR) to be defined (and also included on the PSC).

Designing a ship with suitable equipment, systems and characteristics to mitigate the hazards of the extremes and remoteness of the entire polar environment would be overly burdensome and inappropriate for ships not intended to operate in those extreme polar conditions. As such, ships will be limited in their operations based on the characteristics of the ship, its equipment and systems and the limitations on the certificate are a way of putting these characteristics into a regulatory framework.

For example, with respect to temperature, a ship will be limited in terms of operational area based on the capability of essential equipment to function at low air temperature (which is described by the PST assigned). In the case of the Polar Code, the ship’s operations will be limited to operating in areas where the temperature is a 10 degree safety margin above the PST. Similarly, ships will be restricted to lower latitudes if they do not carry appropriate equipment to ascertain position (position fixing / heading).

As Operational Limitations are directly linked to the ship’s characteristics it is important to ensure the specification for the ship (e.g. ice class, PST, maximum ETR) align with the expected operating envelope (i.e. where and when the ship is expected to operate in polar regions). This validation of the specification for the ship (or the existing ship’s characteristics) against the operating envelope are recommended to form part of the Operational Assessment.

Recommended wording for the Operational Limitations is included in LR’s Guidance note: Limitation Wording for the Polar Ship Certificate available at www.lr.org/polarcode

Operational Capabilities and limitations in ice

Whereas Operational Limitations for temperature, latitude and remoteness are relatively straightforward to describe on a certificate, limiting ice conditions for ship operation in ice are not. Recognising that ships operate in ice conditions where there can be a range and combination of ice types (thickness, strength) and concentrations – termed an ice regime – with associated ranges of risk, the Polar Code requires a methodology to be used to assess the operational capabilities of the ship in ice and that this methodology is to be referenced on the PSC and included in the Polar Waters Operational Manual (PWOM).

Guidelines on Methodologies for assessing operational capabilities and limitations in ice have been developed by the IMO as MSC.1/Circ.1519.

Operational Assessment

The Operational Assessment required by Section 1.5 of the Code is intended to cover three main aspects:

Validate the Operational Limitations

It is the shipowner or operator’s responsibility to specify appropriate design features and operational procedures for the operating environment associated with their anticipated trade. An operating envelope, which identifies the area and season of operation in polar waters and associated environmental conditions (temperature, ice conditions), is recommended to be developed to enable the ship’s required design parameters (ice class, PST, latitude and maximum expected time to rescue) to be established. The envelope essentially sets the applicable requirements for the Code and as such “limits the ship”. i.e. the Operational Limitations required by the Code are defined based on the anticipated environmental conditions expected by the shipowner or operator in the assessment.

Establish Operational Procedures

Various sections of the Code require “means to be provided” for mitigating polar hazards. Depending on the operating environment these means may be equipment or systems, or operational procedures, or a combination of both. The Operational Assessment is used by the shipowner to establish what operational procedures are required (which will subsequently form part of the PWOM content) and what equipment and systems are required (which will form part a new ship’s specification or an existing ship’s design features).

Establish Survival Resources

Chapter 8 explicitly requires survival resources to be determined for abandonment onto water, land or ice. The Operational Assessment is used to identify which abandonment scenarios are appropriate for the operating envelope and what equipment, systems and procedures are required, in addition to these prescribed in the regulations.

Guidance on undertaking the Operational Assessment can be found in Part I-B of the Code. However, because the Operational Assessment is closely linked to the onboard operational procedures for the vessel it is important that the Operational Assessment is “owner led” and in this respect the Operational Assessment and change management processes associated with it should align with the shipowner or operator’s Safety Management System (SMS).

The output from the Operational Assessment is required for:

- developing the Operational Limitations included on the PSC
- establishing the content of the PWOM to meet the Polar Code requirements
- establishing the extent of procedures, equipment and systems required to meet the Polar Code requirements
- determining the extent of additional survival resources required

It should be noted that the Operational Assessment is not approved by the flag Administration. However, because the outputs of the assessment lead to provision of procedures, equipment and Operational Limitations it is important that the Operational Assessment is performed in a structured way and that it is documented. It is anticipated that the decision making process in the Operational Assessment will be reviewed as part of Polar Code compliance.

To assist shipowners and operators in undertaking the Operational Assessment, LR has developed guidance documents and templates to guide you through the process, available at www.lr.org/polarcode

Commentary

Resolution MSC.385 adopts the Introduction and Part I of the Polar Code. The resolution is the legal means by which the IMO's Maritime Safety Committee (MSC) brings the Polar Code into force. Because the MSC is concerned with safety, it only adopted Part I of the Code. In addition the Introduction to the Code was adopted at MSC because it includes relevant context and definitions which are used in Part I.

Adoption of Part I of the Polar Code is through amendments to the International Convention for the Safety of Life at Sea, 1974 (SOLAS), through the introduction of a new Chapter, Chapter XIV. These text amendments form part of a separate MSC Resolution. See MSC.386(94) – Amendments to the International Convention for the Safety of Life at Sea, 1974, as Amended.

RESOLUTION MSC.385(94)

(Adopted on 21 November 2014)

INTERNATIONAL CODE FOR SHIPS OPERATING IN POLAR WATERS (POLAR CODE)

THE MARITIME SAFETY COMMITTEE

RECALLING article 28(b) of the Convention on the International Maritime Organization concerning the function of the Committee.

RECOGNISING the need to provide a mandatory framework for ships operating in polar waters due to the additional demands on ships, their systems and operation, which go beyond the existing requirements of the International Convention for the Safety of Life at Sea (SOLAS), 1974, as amended ("the Convention"), and other relevant binding IMO instruments,

NOTING resolution MSC.386(94), by which it adopted, inter alia, the new chapter XIV of the Convention,

NOTING ALSO that the Marine Environment Protection Committee, at its sixty-seventh session, approved with a view to adoption, at its sixty-eighth session, the Introduction, as it relates to environmental protection, and parts II-A and II-B of the International Code for Ships Operating in Polar Waters (Polar Code), and also considered for adoption relevant amendments to the International Convention for the Prevention of Pollution from Ships, 1973, as modified by the 1978 Protocol,

HAVING CONSIDERED, at its ninety-fourth session, the draft International Code for Ships Operating in Polar Waters:

- 1 ADOPTS the safety-related provisions of the Introduction, and the whole of parts I-A and I-B of the Polar Code, the text of which is set out in the annex to the present resolution;
- 2 AGREES that amendments to the Introduction of the Polar Code that address both safety and environmental protection shall be adopted in consultation with the Marine Environment Protection Committee;
- 3 INVITES Contracting Governments to the Convention to note that the Polar Code will take effect on 1 January 2017 upon entry into force of the new chapter XIV of the Convention;
- 4 INVITES ALSO Contracting Governments to consider the voluntary application of the Polar Code, as far as practicable, also to ships not covered by the Polar Code and operating in polar waters;
- 5 REQUESTS the Secretary-General of the Organization, for the purposes of article VIII(b)(v) of the Convention, to transmit certified copies of the present resolution and the text of the Polar Code, contained in the annex, to all Contracting Governments to the Convention;
- 6 REQUESTS ALSO the Secretary-General of the Organization to transmit copies of the present resolution and the text of the Code contained in the annex to all Members of the Organization which are not Contracting Governments to the SOLAS Convention;
- 7 REQUESTS FURTHER the Secretary-General to prepare a consolidated text of the Polar Code upon adoption of the environmental protection related provisions by the Marine Environment Protection Committee.

Commentary

Resolution MEPC.264 adopts the Introduction and Part II of the Polar Code. The resolution is the legal means by which the IMO's Maritime Environmental Protection Committee (MEPC) brings the Polar Code into force. Because the MEPC is concerned with environmental protection, it only adopted Part II of the Code. In addition the Introduction to the Code was adopted at MEPC because it includes relevant context and definitions which are used in Part II.

Adoption of Part II of the Polar Code is through amendments to the various annexes of the International Convention for the Prevention of Pollution from Ships, 1973 (MARPOL), to which the Code is relevant; for example, Part II – Chapter 1 of the Polar Code is related to Prevention of Pollution from Oil and is therefore adopted in MARPOL through amendments to Annex I of MARPOL. These text amendments form part of a separate MEPC resolution. See MEPC.265(68) – Amendments to the Annex of the Protocol of 1978 Relating to the International Convention for the Prevention of Pollution from Ships, 1973.

RESOLUTION MEPC.264(68)

(Adopted on 15 May 2015)

INTERNATIONAL CODE FOR SHIPS OPERATING IN POLAR WATERS (POLAR CODE)

THE MARINE ENVIRONMENT PROTECTION COMMITTEE

RECALLING Article 38(a) of the Convention on the International Maritime Organization concerning the functions of the Marine Environment Protection Committee conferred upon it by international conventions for the prevention and control of marine pollution from ships,

RECOGNIZING the need to provide a mandatory framework for ships operating in polar waters due to the additional demands for the protection of the marine environment, which go beyond the existing requirements contained in the International Convention for the Prevention of Pollution from Ships, 1973, as modified by the Protocol of 1978 relating thereto as amended by the 1997 Protocol (MARPOL) and other relevant binding IMO instruments,

NOTING resolution MEPC.265(68), by which it adopted, inter alia, amendments to MARPOL Annexes I, II, IV and V to make use of the environment-related provisions of the International Code for Ships Operating in Polar Waters (Polar Code) mandatory,

NOTING ALSO that the Maritime Safety Committee, at its ninety-fourth session, adopted, by resolution MSC.385(94), the Introduction, as it relates to safety, and parts I-A and I B of the Polar Code and, by resolution MSC.386(94), amendments to the 1974 SOLAS Convention to make use of the safety-related provisions of the Polar Code mandatory,

HAVING CONSIDERED, at its sixty-eighth session, the draft International Code for Ships Operating in Polar Waters,

- 1 ADOPTS the environment-related provisions of the Introduction, and the whole of parts II A and II-B of the Polar Code, the text of which is set out in the annex to the present resolution;
- 2 AGREES that amendments to the Introduction of the Polar Code that address both safety and environmental protection shall be adopted in consultation with the Maritime Safety Committee;
- 3 INVITES Parties to note that the Polar Code will take effect on 1 January 2017 upon entry into force of the associated amendments to MARPOL Annexes I, II, IV and V;
- 4 INVITES ALSO Parties to consider the voluntary application of the Polar Code, as far as practicable, to ships not covered by the Polar Code and operating in polar waters;
- 5 REQUESTS the Secretary-General, for the purposes of article 16(2)(e) of MARPOL, to transmit certified copies of the present resolution and the text of the Polar Code, contained in the annex, to all Parties to MARPOL;
- 6 REQUESTS ALSO the Secretary-General to transmit copies of the present resolution and the text of the Polar Code contained in the annex to Members of the Organization which are not Parties to MARPOL;
- 7 REQUESTS FURTHER the Secretary-General to prepare a consolidated certified text of the Polar Code.

Commentary

The preamble to the Code sets the context of the Code. The general philosophy of the Code is that it identifies additional requirements for ships operating in polar waters above those of SOLAS and MARPOL.

PREAMBLE

- 1 The International Code for Ships Operating in Polar Waters has been developed to supplement existing IMO instruments in order to increase the safety of ships' operation and mitigate the impact on the people and environment in the remote, vulnerable and potentially harsh polar waters.
- 2 The Code acknowledges that polar water operation may impose additional demands on ships, their systems and operation beyond the existing requirements of the International Convention for the Safety of Life at Sea (SOLAS), 1974, the International Convention for the Prevention of Pollution from Ships, 1973, as modified by the Protocol of 1978 relating thereto as amended by the 1997 Protocol, and other relevant binding IMO instruments.
- 3 The Code acknowledges that the polar waters impose additional navigational demands beyond those normally encountered. In many areas, the chart coverage may not currently be adequate for coastal navigation. It is recognized even existing charts may be subject to unsurveyed and uncharted shoals.
- 4 The Code also acknowledges that coastal communities in the Arctic could be, and that polar ecosystems are, vulnerable to human activities, such as ship operation.
- 5 The relationship between the additional safety measures and the protection of the environment is acknowledged as any safety measure taken to reduce the probability of an accident, will largely benefit the environment.
- 6 While Arctic and Antarctic waters have similarities, there are also significant differences. Hence, although the Code is intended to apply as a whole to both Arctic and Antarctic, the legal and geographical differences between the two areas have been taken into account.
- 7 The key principles for developing the Polar Code have been to use a risk based approach in determining scope and to adopt a holistic approach in reducing identified risks.

Commentary

Paragraph 2 – Definitions

Paragraph 2 indicates that terms used in the Code that are not defined in the Code itself follow the same definitions of SOLAS or MARPOL. This is particularly relevant for the interpretation of Code requirements. For example, Part II-A, [paragraph 1.1.1](#) prohibits discharge into the sea of oil or oily mixtures from any ship. The definition of oil and oily mixtures should be taken from the relevant definition in MARPOL, in this case MARPOL Annex I, Regulation 1.1 for the definition of oil and Annex I, Regulation 1.3 for the definition of oily mixtures.

In addition to the introduction there are separate definition sections in the Code for Part I and Part II. Therefore, when searching for definitions both the definitions in the introduction and in the separate parts should be consulted.

Paragraph 2.1, 2.2, 2.3 – Ship Categories

The definition of ship Categories is an important concept for using the Code.

Paragraph 2.4, 2.5, 2.6, 2.8, 2.9, 2.15 – Ice types

Ice types used in the Code are defined based on World Meteorological Organization (WMO) nomenclature. Generally the only place in the Code these definitions are used are:

- In the definition of the ship Categories (which in any case are more accurately defined by the ice class)
- In the definition of ice conditions used in Part I, [Chapter 12](#) for defining training requirements for navigators
- In the definition of allowable areas for discharge of sewage in Part II, [Chapter 4](#)
- In the definition of allowable areas for discharge of garbage in Part II, [Chapter 5](#)

INTRODUCTION

1 Goal

The goal of this Code is to provide for safe ship operation and the protection of the polar environment by addressing risks present in polar waters and not adequately mitigated by other instruments of the Organization.

2 Definitions

For the purpose of this Code, the terms used have the meanings defined in the following paragraphs. Terms used in part I-A, but not defined in this section shall have the same meaning as defined in SOLAS. Terms used in part II-A, but not defined in this section shall have the same meaning as defined in article 2 of MARPOL and the relevant MARPOL Annexes.

- 2.1 *Category A ship* means a ship designed for operation in polar waters in at least medium first-year ice, which may include old ice inclusions.
- 2.2 *Category B ship* means a ship not included in Category A, designed for operation in polar waters in at least thin first-year ice, which may include old ice inclusions.
- 2.3 *Category C ship* means a ship designed to operate in open water or in ice conditions less severe than those included in Categories A and B.
- 2.4 *First-year ice* means sea ice of not more than one winter growth developing from young ice with thickness from 0.3 m to 2.0 m .
- 2.5 *Ice free waters* means no ice present. If ice of any kind is present this term shall not be used¹.
- 2.6 *Ice of land origin* means ice formed on land or in an ice shelf, found floating in water¹.
- 2.7 *MARPOL* means the International Convention for the Prevention of Pollution from Ships, 1973, as modified by the Protocol of 1978 relating thereto as amended by the 1997 Protocol.
- 2.8 *Medium first-year ice* means first-year ice of 70 cm to 120 cm thickness¹.
- 2.9 *Old ice* means 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 ice¹.
- 2.10 *Open water* means a large area of freely navigable water in which sea ice is present in concentrations less than 1/10. No ice of land origin is present¹.
- 2.11 *Organization* means the International Maritime Organization.
- 2.12 *Sea ice* means any form of ice found at sea which has originated from the freezing of sea water¹.
- 2.13 *SOLAS* means the International Convention for the Safety of Life at Sea, 1974, as amended.
- 2.14 *STCW Convention* means the International Convention on Standards of Training, Certification and Watchkeeping for Seafarers, 1978, as amended.
- 2.15 *Thin first-year ice* means first-year ice 30 cm to 70 cm thick.

¹ Refer to the WMO Sea Ice Nomenclature.

Commentary

Paragraph 3 – Sources of hazards

The Polar Code identifies additional requirements above SOLAS and MARPOL based on the additional hazards of operating in polar waters. It is to be noted that these hazards may not always be present for all types of ships, due to the variable nature of the polar environment. As such, the Polar Code uses expected temperature and ice conditions as means to prescribe requirements associated with the hazards.

The sources of hazards are also relevant when undertaking the Operational Assessment as required in Part I-A, [paragraph 1.5](#), as the sources provide a framework of hazards to consider when identifying Operational Limitations or establishing operational procedures.

Paragraph 4 – Structure of the Code

Parts I and II of the Code are structured differently. Part I follows a goal based approach and is structured in terms of a hierarchy of goals, functional requirements and prescriptive requirements. Part II is not structured in this way and is entirely prescriptive. This is due to Part I being associated with additions to SOLAS, which has adopted the use of 'goal based standards', as opposed to Part II, which is associated with additions to MARPOL. The MEPC has not, at the time of the Code, adopted the use of goal based standards.

Accompanying the mandatory parts to the Code (Part I-A and Part II-A) are complementary parts (Part I-B and Part II-B respectively), with content that is intended to be recommendatory, or perhaps 'advisory'. The 'B' parts of the Code are not formed as, nor intended to become, regulations, but the content is useful additional information when applying the Code.

3 Sources of hazards

3.1 The Polar Code considers hazards which may lead to elevated levels of risk due to increased probability of occurrence, more severe consequences, or both:

- .1 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;
- .2 Experiencing topside icing, with potential reduction of stability and equipment functionality;
- .3 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;
- .4 Extended periods of darkness or daylight as it may affect navigation and human performance;
- .5 High latitude, as it affects navigation systems, communication systems and the quality of ice imagery information;
- .6 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;
- .7 Potential lack of ship crew experience in polar operations, with potential for human error;
- .8 Potential lack of suitable emergency response equipment, with the potential for limiting the effectiveness of mitigation measures;
- .9 Rapidly changing and severe weather conditions, with the potential for escalation of incidents; and
- .10 The environment with respect to sensitivity to harmful substances and other environmental impacts and its need for longer restoration.

3.2 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 Structure of the Code

This Code consists of Introduction, parts I and II. The Introduction contains mandatory provisions applicable to both parts I and II. Part I is subdivided into part I-A, which contains mandatory provisions on safety measures, and part I-B containing recommendations on safety. Part II is subdivided into part II-A, which contains mandatory provisions on pollution prevention, and part II-B containing recommendations on pollution prevention.

Commentary

Area definitions

Polar waters are shown in Figures 1 and 2. The applicability of the Polar Code is not contained in the Polar Code, but is contained in (a new) Chapter XIV of SOLAS and amendments to each of the relevant MARPOL Annexes. In Chapter XIV the boundary of the polar regions, as indicated in the figures, are expressed in words (co-ordinates). This text is the official definition of polar regions legally while the figures are illustrative.

For guidance, the applicability statement from SOLAS, Chapter XIV is repeated here:

Regulation 2 – Application

- 1 Unless expressly provided otherwise, this chapter applies to ships operating in polar waters, certified in accordance with chapter I.
- 2 Ships constructed before 1 January 2017 shall meet the relevant requirements of the Polar Code by the first intermediate or renewal survey, whichever occurs first, after 1 January 2018.
- 3 In applying part I-A of the Polar Code, consideration should be given to the additional guidance in part I-B of the Polar Code.
- 4 This chapter shall not apply to ships owned or operated by a Contracting Government and used, for the time being, only in Government non-commercial service. However, ships owned or operated by a Contracting Government and used, for the time being, only in Government non-commercial service are encouraged to act in a manner consistent, so far as reasonable and practicable, with this chapter.
- 5 Nothing in this chapter shall prejudice the rights or obligations of States under international law.

Regulation 3 – Requirements for ships to which this chapter applies

- 1 Ships to which this chapter applies shall comply with the requirements of the safety-related provision of the introduction and with part I-A of the Polar Code and shall, in addition to the requirements of regulations I/7, I/8, I/9, and I/10, as applicable, be surveyed and certified, as provided for in that Code.
- 2 Ships to which this chapter applies holding a certificate issued pursuant to the provisions of paragraph 1 shall be subject to the control established in regulations I/19 and XI-1/4. For this purpose, such certificates shall be treated as a certificate issued under regulation I/12 or I/13.

Application

The intention of the application wording was to include all ships to which SOLAS applies that are operating in the polar regions. The reference back to certification in accordance with Chapter I (of SOLAS) was to ensure that ships which usually trade under SOLAS are covered by the Code. This issue mainly arose due to identified voyages into polar regions (in particular the Antarctic) which would normally not touch land inside the polar regions and would therefore, under SOLAS, be considered a domestic voyage. Consequently the Polar Code application (in SOLAS XIV) is intended to apply to ships that usually trade with SOLAS certificates, but may, due to the nature of the voyage, actually be on a domestic voyage when operating in the Polar Code jurisdiction.

For all intents the applicability is to ships that have SOLAS Certificates and are intending to operate in polar regions. In terms of what is meant by SOLAS Certificates, Chapter I of SOLAS includes a number of certificate requirements. Generally the interpretation is, if a ship is carrying a SOLAS Cargo Safety Construction, or Passenger Safety Construction Certificate, the Polar Code applies. There are ships which may only carry SOLAS Safety Radio Certificates (and do not need, due to other applicability reasons, to comply with the other safety requirements of SOLAS). For these few cases, the general recommendation is that the ship would need to follow the Polar Code requirements for the relevant SOLAS requirement that applies to that ship (for example, a ship carrying only a safety radio certificate and intending to operate in polar regions should comply with the relevant requirements of [Chapter 10](#) of the Polar Code). However, this is not a formal interpretation and it is recommended that in such circumstances the ship's flag state is consulted early to agree on applicability requirements.

Figures illustrating 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

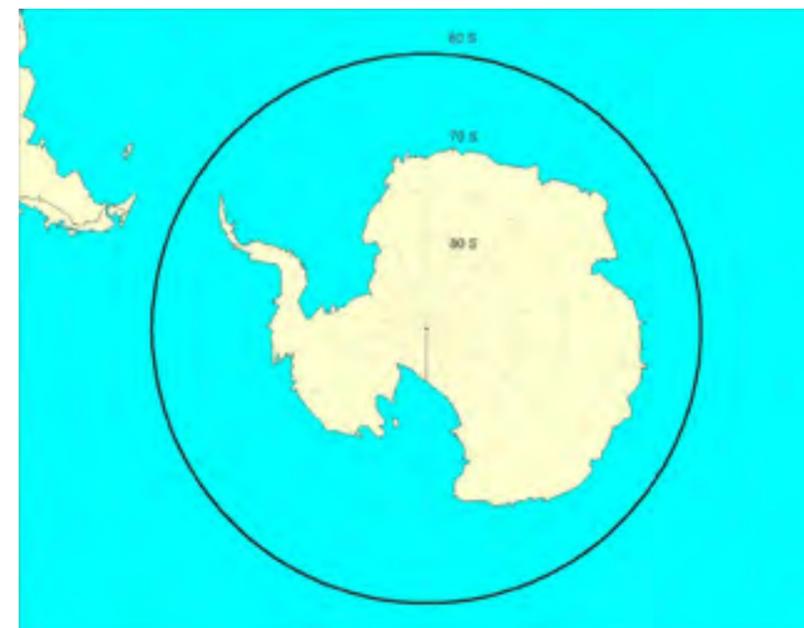


Figure 1: Maximum extent of Antarctic area application²



Figure 2: Maximum extent of Arctic waters application³

² It should be noted that this figure is for illustrative purposes only.

³ It should be noted that this figure is for illustrative purposes only.

Commentary

Paragraph 1.1

Part I-A is structured in a goal based format. Each chapter has a goal. There are a number of functional requirements which must be met. The functional requirements have regulations or requirements associated with them that are a means to meeting the functional requirements. Instead of using the regulations or requirements in the Code text to meet the Code's functional requirements, alternative design and arrangements may be allowed for structure ([Chapter 3](#)), machinery ([Chapter 6](#)), electrical installations (Parts of [Chapter 6](#)), fire safety ([Chapter 7](#)) and life-saving appliances and arrangements ([Chapter 8](#)).

This is essentially the meaning of paragraph 1.1.2 of the Code as expressed in regulation 4 of SOLAS XIV: where alternative design or arrangements are proposed they are to be justified based on IMO Guidelines for approval of alternatives (MSC.1/Circ.1455, MSC.1/Circ.1212 and MSC/Circ.1002 refers). Note that alternative design and arrangements to meet the functional requirements are only permitted for some chapters in Part I-A. Generally these chapters align with the parent part of SOLAS that has already been formatted in a goal based approach. For example, the stability requirements in [Chapter 4](#) of the Code do not allow for alternative design and arrangements as the stability requirements in SOLAS are prescriptive and not goal based.

In general the majority of regulations are phrased to allow for various design solutions to be used. As such it is anticipated that the alternative design and arrangement approaches will only be used in unusual circumstances where novel systems and equipment are proposed.

Paragraph 1.2

These definitions should be read in conjunction with the definitions set at the beginning of the Code in the introduction.

Paragraphs 1.2.2, 1.2.3 and 1.2.5

Definitions for 'icebreaker' and 'escort' are only used in the Code for describing the need for operational procedures ([Chapter 2.3.6](#)) if the ship is intended to operate under support of an icebreaker. There are no special requirements for icebreakers or for ships to be escorted in the Code.

PART I-A – SAFETY MEASURES

CHAPTER 1 – GENERAL

1.1 Structure of this part

Each chapter in this part consists of the overall goal of the chapter, functional requirements to fulfil the goal, and regulations. A ship shall be considered to meet a functional requirement set out in this part when either:

- .1 the ship's design and arrangements comply with all the regulations associated with that functional requirement; or
- .2 part(s) or all of the ship's relevant design and arrangements have been reviewed and approved in accordance with regulation 4 of SOLAS chapter XIV, and any remaining parts of the ship comply with the relevant regulations.

1.2 Structure of this part

In addition to the definitions included in the relevant SOLAS chapters and the introduction of this Code, the following definitions are applicable to this part.

- 1.2.1 *Bergy waters* mean an area of freely navigable water in which ice of land origin is present in concentrations less than 1/10. There may be sea ice present, although the total concentration of all ice shall not exceed 1/10.
- 1.2.2 *Escort* means any ship with superior ice capability in transit with another ship.
- 1.2.3 *Escorted operation* means any operation in which a ship's movement is facilitated through the intervention of an escort.
- 1.2.4 *Habitable environment* means a ventilated environment that will protect against hypothermia.
- 1.2.5 *Icebreaker* means any ship whose operational profile may include escort or ice management functions, whose powering and dimensions allow it to undertake aggressive operations in ice-covered waters.
- 1.2.6 *Ice Class* means the notation assigned to the ship by the Administration or by an organization recognized by the Administration showing that the ship has been designed for navigation in sea-ice conditions.

Commentary

Paragraph 1.2.7 – Maximum expected time to rescue

The IMO, in the 1979 International Convention on Maritime Search and Rescue (the SAR Convention), defines rescue as “An operation to retrieve persons in distress, provide for their initial medical or other needs, and deliver them to a place of safety”.

The concept of the maximum Expected Time to Rescue (ETR) is based on an assumption that polar regions are more remote than other sea areas, that availability of search and rescue services is more limited and that the environmental conditions mean that deployment of search and rescue services is more difficult. As such the expected time to rescue is intended to be selected by the operator to reflect an increased length of time during which the ship and its crew will have to survive until rescued.

The maximum ETR must be no less than five days. This timescale was selected based on the length of time that the lifeboat rations currently required to be carried by SOLAS are intended to last.

The maximum ETR affects:

- the functionality of any life-saving appliances used for safe evacuation ([paragraph 8.2.2](#))
- the provision of survival resources (habitat, protection, communication equipment) ([paragraph 8.2.3.3](#))
- the provision of emergency rations ([paragraph 8.3.3.4](#))
- the operability of communication on survival craft ([paragraph 10.3.2.3](#))

See also the commentary on survival resources in [Chapter 8](#).

The specified ETR will therefore affect equipment and provisions carried on board. The maximum ETR is specified by the shipowner at time of build. For voyage planning purposes the maximum ETR should be considered when planning routes in remote areas. The maximum ETR is included on the PSC and as such the ship is limited by it.

Paragraph 1.3.2

PSCs are issued after completion of an initial survey for Polar Code compliance. A draft of the model certificate can be found in [Appendix 1](#).

Paragraph 1.3.3

This paragraph is intended to address spot market trade for ships making a one-off voyage into polar regions. It allows for a PSC to be issued without Survey if an Operational Assessment has been undertaken and it can be demonstrated that all appropriate requirements can be met with operational procedures.

Essentially this means that a ship may be issued a PSC (essentially a short-term certificate) on the proviso that:

- an Operational Assessment has been undertaken
- all requirements can be met with operational procedures
- the ship is carrying a PWOM which documents these procedures
- the ship is operating as a Category C ship
- the ship is operating in areas where the lowest MDLT is above -10°C
- the crew are appropriately trained.

- ▶ 1.2.7 *Maximum expected time of rescue* means the time adopted for the design of equipment and system that provide survival support. It shall never be less than 5 days.
- 1.2.8 *Machinery Installations* means equipment and machinery and its associated piping and cabling, which is necessary for the safe operation of the ship.
- 1.2.9 *Mean Daily Low Temperature (MDLT)* means the mean value of the daily low temperature for each day of the year over a minimum 10 year period. A data set acceptable to the Administration may be used if 10 years of data is not available⁴.
- 1.2.10 *Polar Class (PC)* means the ice class assigned to the ship by the Administration or by an organization recognized by the Administration based upon IACS Unified Requirements.
- 1.2.11 *Polar Service Temperature (PST)* means 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.
- 1.2.12 *Ship intended to operate in low air temperature* means a ship which is intended to undertake voyages to or through areas where the lowest Mean Daily Low Temperature (MDLT) is below -100°C.
- 1.2.13 *Tankers* mean oil tankers 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.
- 1.2.14 *Upper ice waterline* means the waterline defined by the maximum draughts forward and aft for operation in ice.

1.3 Certificate and survey

- 1.3.1 Every ship to which this Code applies shall have on board a valid Polar Ship Certificate.
- ▶ 1.3.2 Except as provided for in [paragraph 1.3.3](#), the Polar Ship Certificate shall be issued after an initial or renewal survey to a ship which complies with the relevant requirements of this Code.
- ▶ 1.3.3 For Category C cargo ships, if the result of the assessment in [paragraph 1.5](#) is that no additional equipment or structural modification is required to comply with the Polar Code, the Polar Ship Certificate may be issued based upon documented verification that the ship complies with all relevant requirements of the Polar Code. In this case, for continued validity of the certificate, an on board survey should be undertaken at the next scheduled survey.
- 1.3.4 The certificate referred to in this regulation shall be issued either by the Administration or by any person or organization recognized by it in accordance with SOLAS regulation XI 1/1. In every case, that Administration assumes full responsibility for the certificate.
- 1.3.5 The Polar Ship Certificate shall be drawn up in the form corresponding to the model given in [appendix 1](#) to this Code. If the language used is neither English, nor French nor Spanish, the text shall include a translation into one of these languages.

⁴ Refer also to additional guidance in part I-B.

Commentary

Paragraph 1.3.7

Various methodologies exist for describing the safety level (or level of risk) that a ship is at when it encounters an ice regime, their main elements being an evaluation of the ship's strength (often by reference to its ice class) and an evaluation of the ice regime anticipated to be encountered. In order for administrations to have a common baseline for accepting methodologies, the MSC Circular, MSC.1/Circ.1519, has been developed – Guidance on Methodologies for Assessing Operational Capabilities and Limitations in Ice. The Circular includes as an appendix one such methodology that may be used: 'POLARIS'. It is intended that such a methodology would be included in the ship's PWOM ([paragraph 2.2.2](#)) and referenced on the certificate.

See also:

- LR's How to Use POLARIS, available at www.lr.org/polarcode
- MSC Circular, MSC.1/Circ.1519 – Guidance on Methodologies for Assessing Operational Capabilities and Limitations in Ice
- The "Operational Limitations" section on [page 7](#).

Paragraph 1.4

This covers requirements for all equipment and systems required by the Code. This includes additional equipment required as a result of the outcome of the Operational Assessment if it is identified as required for mitigating the hazards of operating in polar waters.

It should be noted that current SOLAS lifesaving equipment is tested down to functionality at -15°C and storage at -30°C.

Unified testing standards and updates to the LSA Code to reflect Polar Code requirements are still in development. In the interim it is recommended that the following approach is taken for meeting the performance standard:

1. Ships which are not intended to operate in low air temperature:
 - Carriage of SOLAS certified equipment is generally considered acceptable.
2. Ships which are intended to operate in low air temperature:
 1. For life saving equipment and other essential equipment where SOLAS or classification society rules currently requires testing: Equipment is to be tested using the existing SOLAS / classification society approved procedures but with the test temperature aligned to the PST.
 2. For other equipment and systems exposed to low air temperature:
 - i. to be constructed of material appropriate for the PST
 - ii to be provided with a manufacturer's certificate for operation at the PST.

Paragraph 1.5

This describes the Operational Assessment which is required to be carried out for all ships. See the 'important concepts' section on [page 8](#) for more detailed information.

1.3.6 Polar Ship Certificate validity, survey dates and endorsements shall be harmonized with the relevant SOLAS certificates in accordance with the provisions of regulation I/14 of the SOLAS Convention. The certificate shall include a supplement recording equipment required by the Code.

1.3.7 Where applicable, the certificate shall reference a methodology to assess operational capabilities and limitations in ice to the satisfaction of the Administration, taking into account the guidelines developed by the Organization⁵.

1.4 Performance standards

1.4.1 Unless expressly provided otherwise, ship systems and equipment addressed in this Code shall satisfy at least the same performance standards referred to in SOLAS.

1.4.2 For ships operating in low air temperature, a polar service temperature (PST) shall be specified and shall be at least 10°C below the lowest MDLT for the intended area and season of operation in polar waters. Systems and equipment required by this Code shall be fully functional at the polar service temperature.

1.4.3 For ships operating in low air temperature, survival systems and equipment shall be fully operational at the polar service temperature during the maximum expected rescue time.

1.5 Operational assessment

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:

- .1 the anticipated range of operating and environmental conditions, such as:
 - .1 operation in low air temperature;
 - .2 operation in ice;
 - .3 operation in high latitude; and
 - .4 potential for abandonment onto ice or land;
- .2 hazards, as listed in section 3 of the Introduction, as applicable; and
- .3 additional hazards, if identified.

⁵ Refer to guidance to be developed by the Organization.

Commentary

Paragraphs 2.1, 2.2 and 2.3

The PWOM is required to be carried on board and should be considered an extension of the procedures carried on board as part of the ship's Safety Management System under the ISM Code. The PWOM may either be a stand-alone document or a document which cross-references other procedures carried by the ship. As such the PWOM should be developed and maintained by the ship's operator. Although for a new ship, the shipyard may assist in providing valuable information on the capabilities or functionality of the ship's systems to describe in the PWOM, the responsibility for maintaining and updating the PWOM lies with the ship's operator.

It should be noted that the content of Chapter 2 contains requirements that are not found elsewhere in the Code. i.e. Chapter 2 is more than a collection of documentation related to requirements described in other chapters of the Code and contains additional requirements relating to procedures.

A model content of the PWOM is included in the Code as Appendix 2.

The requirements for the PWOM content are described in paragraphs 2.2 and 2.3 of Chapter 2. In order for the outcome of the Operational Assessment to be implemented clearly, the PWOM should contain any specific operational procedures identified by the Operational Assessment that are required to mitigate hazards of operating in polar waters based on the operating envelope defined for the ship's intended trade. This is addressed in 2.2.3 – 2.2.6 of the functional requirements. In particular it is to be noted that where operational procedures are identified in the Operational Assessment as a means to mitigate hazards in combination with specific equipment (or as an alternative to specific equipment) these procedures are to be included – see paragraph 2.3.3.5.

The Code requirement in paragraph 2.3.2 indicates that the methodology associated with the limitations specified on the Certificate be included in the PWOM. It is recommended that the PWOM not only contain the methodology, but practical guidance on its use, including examples of the method. Where a methodology is supplemented by additional company or operator specific guidance it is recommended to be included.

CHAPTER 2 – POLAR WATER OPERATIONAL MANUAL (PWOM)

2.1 Goal

The goal of this chapter is to provide the shipowner, operator, master and crew with sufficient information regarding the ship's operational capabilities and limitations in order to support their decision-making process.

2.2 Functional requirements

- 2.2.1 In order to achieve the goal set out in paragraph 2.1 above, the following functional requirements are embodied in the regulations of this chapter.
- 2.2.2 The Manual shall include information on the ship-specific capabilities and limitations in relation to the assessment required under paragraph 1.5.
- 2.2.3 The Manual shall include or refer to specific procedures to be followed in normal operations and in order to avoid encountering conditions that exceed the ship's capabilities.
- 2.2.4 The Manual shall include or refer to specific procedures to be followed in the event of incidents in polar waters.
- 2.2.5 The Manual shall include or refer to specific procedures to be followed in the event that conditions are encountered which exceed the ship's specific capabilities and limitations in paragraph 2.2.2.
- 2.2.6 The Manual shall include or refer to procedures to be followed when using icebreaker assistance, as applicable.

2.3 Regulations

- 2.3.1 In order to comply with the functional requirements of paragraphs 2.2.1 to 2.2.6, the Manual shall be carried on board.
- 2.3.2 In order to comply with the functional requirements of paragraph 2.2.2, the Manual shall contain, where applicable, the methodology used to determine capabilities and limitations in ice.
- 2.3.3 In order to comply with the functional requirements of paragraph 2.2.3, the Manual shall include risk based procedures for the following:
 - .1 voyage planning to avoid ice and/or temperatures that exceed the ship's design capabilities or limitations;
 - .2 arrangements for receiving forecasts of the environmental conditions;
 - .3 means of addressing any limitations of the hydrographic, meteorological and navigational information available;
 - .4 operation of equipment required under other chapters of this Code; and
 - .5 implementation of special measures to maintain equipment and system functionality under low temperatures, topside icing and the presence of sea ice, as applicable.

Commentary

Paragraph 2.3.5

The Polar Code recognises that, even with responsible planning and preparation, environmental conditions in the polar regions are unpredictable. As such, the PWOM is required to contain procedures for when ice and/or temperatures are encountered that exceed the ship's design capabilities.

If using POLARIS, this already broadly identifies the actions to be taken when encountering ice regimes that result in "operation subject to special consideration". The PWOM requires this detail to be expanded to identify company-specific procedures related to these conditions.

With respect to temperature exceeding the design capabilities the following points should be noted:

- 2.3.5 applies to all ships, regardless of if they are a ship intended to operate in low temperature or not. i.e. if the ship is intended to operate above -10°C it is still required to include procedures where the temperature may be lower than anticipated – the Operational Assessment can be used to establish reasonable thresholds.
- The PST already includes a 'safety margin'. The PST is set 10°C below the anticipated lowest MDLT or the area and season of operation.

Paragraph 2.3.6

Depending on jurisdiction and sea area, approaches and procedures for operating under icebreaker escort vary. Based on the expected operational area, it is recommended that the guidelines issued by local authorities responsible for icebreaking are consulted.

2.3.4 In order to comply with the functional requirements of paragraph 2.2.4, the Manual shall include risk-based procedures to be followed for:

- .1 contacting emergency response providers for salvage, search and rescue (SAR), spill response, etc., as applicable; and
- .2 in the case of ships ice strengthened in accordance with chapter 3, procedures for maintaining life support and ship integrity in the event of prolonged entrapment by ice.

2.3.5 In order to comply with the functional requirements of paragraph 2.2.5, the Manual shall include risk-based procedures to be followed for measures to be taken in the event of encountering ice and/or temperatures which exceed the ship's design capabilities or limitations.

2.3.6 In order to comply with the functional requirements of paragraph 2.2.6, the Manual 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.

Commentary

Paragraph 3.2.1 and 3.3.1 – use of approved materials for ships intended to operate in low air temperature
Requirements for notch toughness of steel (steel grades) to be used are set by IACS Unified Requirement S6 and/or IACS Unified Requirement I2. IACS S6 has been updated to include consideration for ships intended to operate in low air temperatures and ships assigned a PST. Note that for ships without a PST or with a relatively high PST the requirements of S6 are the same as for ships designed for operating in non-polar waters. Note that in addition to S6, steel grade requirements are applicable if the ship is assigned a Polar Class (ice class) as IACS UR I2 includes steel grade requirements for Polar Class ships. In cases where the ship is assigned a Polar Class and has a PST, both sets of requirements are to be considered and the most onerous taken for each structural member under consideration.

Paragraph 3.2.2 – ice strengthening for ice strengthened ships
The Polar Code does not require all ships to have an ice class. Because the polar environment is so varied the Polar Code does not set ice class requirements directly. Instead the ship will be limited, based on the Operational Limitations on the certificate. As the Operational Limitations are to be determined based on a methodology (paragraph 1.3.7) it follows that such a methodology may be used for selecting the appropriate ice class (and consequently ship Category) based on the anticipated ice conditions from the operating envelope. As can be seen from using methodologies such as POLARIS, ships with no ice strengthening may operate in some light ice conditions. Furthermore, various areas of the polar regions may not contain ice during certain periods of the year.

Paragraph 3.3.2 – ice classes referenced and the phrase “Equivalent Level of Safety”
The footnotes to paragraph 3.3.2 infer that Category A ships are those with assigned ice class PC1 – PC5 inclusive, and that ships are considered Category B ships where the assigned ice class is PC6 – PC7, with PC1 being the highest. Ships with an ice class below PC7, including ships with no ice class, are considered Category C ships.

As the IACS Polar Class rules are relatively new, and a significant proportion of the world’s existing ice class tonnage does not have a Polar Class assigned, the term “equivalent level of safety” has been used to allow for existing ships that do not have a Polar Class to be assigned an appropriate ship Category. Part I-B of the Code includes overall guidance on the approach to determining an equivalent level of safety; however, it is expected that the ship’s classification society will assist the shipowner of existing tonnage in establishing the ship Category, and where necessary, making the case to the flag state.

Generally an equivalent level of safety is established by comparing the strength of the ship’s hull and propulsion machinery (propeller and shafting) and hull material grade requirements against the IACS Polar Class rules. It is anticipated that this will not result in existing ships being assigned a Polar Class – they will retain their existing ice class – but that a ship Category will be assigned for certification and compliance purposes based on the evaluation. Such evaluations for equivalent level of safety may also be used when using class-based methodologies for determining limitations for operating in ice, such as POLARIS.

CHAPTER 3 – SHIP STRUCTURE

3.1 Goal

The goal of this chapter is to provide that the material and scantlings of the structure retain their structural integrity based on global and local response due to environmental loads and conditions.

3.2 Functional requirements

In order to achieve the goal set out in paragraph 3.1 above, the following functional requirements are embodied in the regulations of this chapter:

- .1 for ships intended to operate in low air temperature, materials used shall be suitable for operation at the ships polar service temperature; and
- .2 in ice strengthened ships, the structure of the ship shall be designed to resist both global and local structural loads anticipated under the foreseen ice conditions.

3.3 Regulations

- 3.3.1 In order to comply with the functional requirements of paragraph 3.2.1 above, materials of exposed structures in ships shall be approved by the Administration, or a recognized organization accepted by it, taking into account standards acceptable to the Organization⁶ or other standards offering an equivalent level of safety based on the polar service temperature.
- 3.3.2 In order to comply with the functional requirements of paragraph 3.2.2 above, the following apply:
 - .1 scantlings of Category A ships shall be approved by the Administration, or a recognized organization accepted by it, taking into account standards acceptable to the Organization⁷ or other standards offering an equivalent level of safety;
 - .2 scantlings of Category B ships shall be approved by the Administration, or a recognized organization accepted by it, taking into account standards acceptable to the Organization⁸ or other standards offering an equivalent level of safety;
 - .3 scantlings of ice strengthened Category C ships shall be approved by the Administration, or a recognized organization accepted by it, taking into account acceptable standards adequate for the ice types and concentrations encountered in the area of operation; and
 - .4 a Category C ship need not be ice strengthened if, in the opinion of the Administration, the ship’s structure is adequate for its intended operation.

⁶ Refer to IACS UR S6 Use of Steel Grades for Various Hull Members – Ships of 90 m in Length and Above (latest version) or IACS URI Requirements concerning Polar Class (latest version), as applicable.

⁷ Refer to Polar Class 1-5 of IACS URI Requirements concerning Polar Class (latest version).

⁸ Refer to Polar Class 6-7 of IACS URI Requirements concerning Polar Class (latest version).

Commentary

Paragraph 4.2.1 – ships subject to ice accretion, or operating in areas and during periods where ice accretion is likely to occur

The Polar Code requires added weight due to ice accretion to be considered when assessing the intact stability of the ship. It should be noted that this requirement applies to new and existing ships. However, the Polar Code does not give guidance on how to determine if a ship is “likely” to be subject to ice accretion. The likelihood should be evaluated as part of the Operational Assessment and documented accordingly. The icing allowance included in paragraph 4.3.1.1 of the Polar Code is extracted from the Intact Stability Code, Chapter 5.3. Chapter 5.3, although stated for fishing vessels, has been used for consideration of ice accretion for Polar vessels historically and includes a chart of regional areas where the ice accretion allowance should be considered. However, the chart does not consider season of operation. As a guide, 5.3.3.8 of the Intact Stability Code indicates that slow ice accumulation takes place at ambient temperatures from -1°C to -3°C and below in any wind force.

See also the LR guidance on ice accretion in Part 8, Chapter 1 of the Rules for Ships.



Chart of icing conditions areas from the Intact Stability Code

Paragraph 4.3.1.2

As guidance for paragraph 4.3.1.2, designing for minimising accretion of ice includes: minimising horizontal surfaces, minimising cylinder formed equipment, and providing tarpaulins / covers.

The requirement in paragraph 4.3.1.2.2 for providing ice removal equipment should be read in conjunction with paragraph 5.3.1 and paragraph 8.3.1.1. It is recommended that even if systems are provided for “anti-icing” that manual tools are provided in addition.

Paragraph 4.3.1.3

As guidance for paragraph 4.3.1.3 it is considered appropriate if the PWOM cross references the relevant section of the ship’s onboard approved trim and stability booklet.

CHAPTER 4 – SUBDIVISION AND STABILITY

4.1 Goal

The goal of this chapter is to ensure adequate subdivision and stability in both intact and damaged conditions.

4.2 Functional requirements

In order to achieve the goal set out in paragraph 4.1 above, the following functional requirements are embodied in the regulations of this chapter:

- .1 ships shall have sufficient stability in intact conditions when subject to ice accretion; and
- .2 ships of Category A and B, constructed on or after 1 January 2017, shall have sufficient residual stability to sustain ice-related damages.

4.3 Regulations

4.3.1 Stability in intact conditions

4.3.1.1 In order to comply with the functional requirement of paragraph 4.2.1, for ships operating in areas and during periods where ice accretion is likely to occur, the following icing allowance shall be made in the stability calculations:

- .1 30 kg/m² on exposed weather decks and gangways;
- .2 7.5 kg/m² for the projected lateral area of each side of the ship above the water plane; and
- .3 the projected lateral area of discontinuous surfaces of rail, sundry booms, spars (except masts) and rigging of ships having no sails and the projected lateral area of other small objects shall be computed by increasing the total projected area of continuous surfaces by 5% and the static moments of this area by 10%.

4.3.1.2 Ships operating in areas and during periods where ice accretion is likely to occur shall be:

- .1 designed to minimize the accretion of ice; and
- .2 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.

4.3.1.3 Information on the icing allowance included in the stability calculations shall be given in the PWOM.

4.3.1.4 Ice accretion shall be monitored and appropriate measures taken to ensure that the ice accretion does not exceed the values given in the PWOM.

Commentary

Paragraph 4.3.2.1 – damage stability requirements

Assessment of stability in damaged conditions due to ice does not need to simultaneously consider ice accretion loading with damage stability requirements.

The first two sentences of paragraph 4.3.2.1 apply to ships that are required to carry out a probabilistic damage stability assessment as part of other requirements in SOLAS. Other damage stability requirements exist which set alternative evaluation criteria, for example MARPOL Annex I, Regulation 28, where MARPOL would be considered as “another instrument developed by the Organisation” and the assessment criteria after ice damage would be Regulation 28.3.

Paragraph 4.3.2.2

This uses the upper ice waterline to determine extent of damage. This definition is consistent with the IACS Polar Class rules and corresponds to the deepest draft at which the ship is intended to operate in ice. This may be different from the scantling draft as shipowners may use different loading conditions when operating in ice. The upper ice waterline should align with the maximum draft indicated on the PSC.

4.3.2 Stability in damaged conditions

4.3.2.1 In order to comply with the functional requirements of paragraph 4.2.2, ships of Categories A and B, constructed on or after 1 January 2017, shall be able to withstand flooding resulting from hull penetration due to ice impact. The residual stability following ice damage shall be such that the factor s_i , as defined in SOLAS regulations II-1/7-2.2 and II 1/7 2.3, is equal to one for all loading conditions used to calculate the attained subdivision index in SOLAS regulation II 1/7. However, for cargo ships that comply with subdivision and damage stability regulations in another instrument developed by the Organization, as provided by SOLAS regulation II-1/4.1, the residual stability criteria of that instrument shall be met for each loading condition.

4.3.2.2 The ice damage extents to be assumed when demonstrating compliance with paragraph 4.3.2.1 shall be such that:

- .1 the longitudinal extent is 4.5% of the upper ice waterline length if centred forward of the maximum breadth on the upper ice waterline, and 1.5% of upper ice waterline length otherwise, and shall be assumed at any longitudinal position along the ship's length;
- .2 the transverse penetration extent is 760 mm, measured normal to the shell over the full extent of the damage; and
- .3 the vertical extent is the lesser of 20% of the upper ice waterline draught or the longitudinal extent, and shall be assumed at any vertical position between the keel and 120% of the upper ice waterline draught.

Commentary

Paragraph 5.3

It should be noted that paragraph 5.3 applies only to doors and hatches which are exposed.

Paragraph 5.3.1

Attention is drawn to the wording “means shall be provided to remove or prevent ice and snow accretion”. Such solutions could include protection and sheltering of hatches and doors, provision of manual ice removal tools, provision of steam lances or hot water hoses, and trace heating of door or hatch seals.

See commentary on definition of ships operating in areas and during periods where ice accretion is likely in [paragraph 4.2.1](#).

Paragraph 5.3.2.2

The intention of paragraph 5.3.2.2 is to ensure that doors and hatches are accessible when wearing cold weather clothing which may be bulky and hinder manual operation.

CHAPTER 5 – WATERTIGHT AND WEATHERTIGHT INTEGRITY

5.1 Goal

The goal of this chapter is to provide measures to maintain watertight and weathertight integrity.

5.2 Functional requirements

In order to achieve the goal set out in paragraph 5.1 above, all closing appliances and doors relevant to watertight and weathertight integrity of the ship shall be operable.

5.3 Regulations

In order to comply with the functional requirements of paragraph 5.2 above, the following apply:

- .1 for ships operating in areas and during periods where ice accretion is likely to occur, means shall be provided to remove or prevent ice and snow accretion around hatches and doors; and
- .2 in addition, for ships intended to operate in low air temperature the following apply:
 - .1 if the hatches or doors are hydraulically operated, means shall be provided to prevent freezing or excessive viscosity of liquids; and
 - .2 watertight and weathertight doors, hatches and closing devices which are not within an habitable environment and require access while at sea shall be designed to be operated by personnel wearing heavy winter clothing including thick mittens.

Commentary

Paragraph 6.1.

Attention is drawn to the definition of 'machinery installations': Paragraph 1.2.8 indicates that it means equipment and machinery and its associated piping and cabling, which is necessary for the safe operation of the ship. Based on this definition the following is considered 'machinery installations' (propelling and essential auxiliary machinery as defined in Part 1, Chapter 2 of LR's Rules for Ships):

Propelling and essential auxiliary machinery includes machinery, equipment and systems installed for the ship to be under seagoing conditions and that are necessary for the following:

- a. Maintaining the watertight and weathertight integrity of the hull and spaces within the hull
- b. The safety of the ship, machinery and personnel on board
- c. The functioning and dependability of propulsion, steering and electrical systems
- d. The operation and functioning of control engineering systems for the monitoring and safety of propulsion and steering systems
- e. The operation and functioning of emergency machinery and equipment.

Paragraph 6.2.1.3

The intention of paragraph 6.2.1.3 is to align the requirements for hull structure with those for machinery installations: i.e. if a certain level of ice strengthening is required for certain ice environmental conditions these should also be used to determine the level of ice strengthening required for the propulsion machinery.

Paragraph 6.3.1.1.

Note that paragraph 6.3.1.1 applies to all ships, although the extent of application will depend on the anticipated environmental conditions. i.e. if the ship is not considered likely to operate in areas subject to ice accretion as per Chapter 4 then ice accretion need not be considered for machinery installations. It should be noted that ice ingestion from sea water (e.g. slush ice) is also applicable to ships that are not intended to operate in low air temperature as slush ice is primarily a function of sea water temperature: any ship that is operating in ice should have provision for mitigating slush build up in the sea bay / sea chest.

CHAPTER 6 – MACHINERY INSTALLATIONS

6.1 Goal

The goal of this chapter is to ensure that, machinery installations are capable of delivering the required functionality necessary for safe operation of ships.

6.2 Functional requirements

6.2.1 In order to achieve the goal set out in paragraph 6.1 above, the following functional requirements are embodied in the regulations of this chapter.

6.2.1.1 Machinery installations shall provide functionality under the anticipated environmental conditions, taking into account:

- .1 ice accretion and/or snow accumulation;
- .2 ice ingestion from seawater;
- .3 freezing and increased viscosity of liquids;
- .4 seawater intake temperature; and
- .5 snow ingestion.

6.2.1.2 In addition, for ships intended to operate in low air temperatures:

- .1 machinery installations shall provide functionality under the anticipated environmental conditions, also taking into account:
 - .1 cold and dense inlet air; and
 - .2 loss of performance of battery or other stored energy device; and
 - .2 materials used shall be suitable for operation at the ships polar service temperature.

6.2.1.3 In addition, for ships ice strengthened in accordance with chapter 3, machinery installations shall provide functionality under the anticipated environmental conditions, taking into account loads imposed directly by ice interaction.

6.3 Regulations

6.3.1 In order to comply with the functional requirement of paragraph 6.2.1.1 above, taking into account the anticipated environmental conditions, the following apply:

- .1 machinery installations and associated equipment shall be protected against the effect of ice accretion and/or snow accumulation, ice ingestion from sea water, freezing and increased viscosity of liquids, seawater intake temperature and snow ingestion;
- .2 working liquids shall be maintained in a viscosity range that ensures operation of the machinery; and
- .3 seawater supplies for machinery systems shall be designed to prevent ingestion of ice⁹, or otherwise arranged to ensure functionality.

⁹ Refer to MSC/Circ.504, Guidance on design and construction of sea inlets under slush ice conditions.

Commentary

Paragraph 6.3.2.1

Note that paragraph 6.3.2.1 applies to exposed machinery installations as defined in the goal of the chapter.

Paragraph 6.3.2.3

Note that the IACS URI contains requirements for materials exposed to sea water and materials exposed to low air temperature. It is considered that the relevant sections of URI3 (sections concerning Materials Exposed to Sea-Water, Materials Exposed to Sea-Water Temperature, Materials Exposed to Low Air Temperature) can be applied to any ship which is intended to operate in low air temperature, regardless of the ice class assigned.

Paragraph 6.3.3

Paragraph 6.3.3 uses the same approach to offering an equivalent level of safety as [Chapter 3](#). i.e. for an equivalent level of safety to be demonstrated against a Polar Class, the hull structure, propulsion machinery and materials need to be evaluated.

6.3.2 In addition, for ships intended to operate in low air temperatures, the following apply:

- .1 in order to comply with the functional requirement of paragraph 6.2.1.2 above, exposed machinery and electrical installation and appliances shall function at the polar service temperature;
- .2 in order to comply with the functional requirement of paragraph 6.2.1.2.1 above, means shall be provided to ensure that combustion air for internal combustion engines driving essential machinery is maintained at a temperature in compliance with the criteria provided by the engine manufacturer; and
- .3 in order to comply with the functional requirements of paragraph 6.2.1.2.2 above, materials of exposed machinery and foundations shall be approved by the Administration, or a recognized organization accepted by it, taking into account standards acceptable to the Organization^{10, 11} or other standards offering an equivalent level of safety based on the polar service temperature.

6.3.3 In addition, for ships ice strengthened in accordance with chapter 3, in order to comply with the functional requirements of paragraph 6.2.1.3 above, the following apply:

- .1 scantlings of propeller blades, propulsion line, steering equipment and other appendages of Category A ships shall be approved by the Administration, or a recognized organization accepted by it, taking into account standards acceptable to the Organization¹⁰ or other standards offering an equivalent level of safety;
- .2 scantlings of propeller blades, propulsion line, steering equipment and other appendages of Category B ships shall be approved by the Administration, or a recognized organization accepted by it, taking into account standards acceptable to the Organization¹¹ or other standards offering an equivalent level of safety; and
- .3 scantlings of propeller blades, propulsion line, steering equipment and other appendages of ice-strengthened Category C ships shall be approved by the Administration, or a recognized organization accepted by it, taking into account acceptable standards adequate with the ice types and concentration encountered in the area of operation.

¹⁰ Refer to Polar Class 1–5 of IACS URI Requirements concerning Polar Class (2011).

¹¹ Refer to Polar Class 6–7 of IACS URI Requirements concerning Polar Class (2011).

Commentary

Paragraph 7.3.1

Note that the regulations in paragraph 7.3.1 should be read in the context of paragraph 7.2.1.1. It is the intention that these regulations only apply where the likelihood of ice accretion and snow accumulation has been identified. It is recommended that the threshold for applying this regulation is if the ship is considered to operate in areas where ice accretion is likely to occur, as identified in [paragraph 4.2.1](#).

Paragraph 7.3.1.1

Unlike the majority of the Polar Code regulations which use the terminology “means shall be provided to remove or prevent ice accretion”, paragraph 7.3.1.1 indicates that exposed PV valves are to be protected from ice accretion. This infers active protection such as insulation and heat tracing.

Paragraph 7.3.1.2

Paragraph 7.3.1.2 only applies to ships intended to operate in low air temperatures.

Paragraph 7.3.2

Note that the regulations in paragraph 7.3.2 should be read in the context of paragraph 7.2.1.2. It is the intention that these regulations only apply where ice accretion, snow accumulation or freezing are likely to occur.

Paragraph 7.3.2.1

This only applies where the compartment is considered to be likely to freeze. It is recommended that where the compartment is partly or fully above the ballast waterline, ‘lowest MDLT <0°C for the area and season of operation’ is used for this threshold. Where the compartment is located entirely below the ballast waterline it is recommended that ‘lowest MDLT < -10°C for the area and season of operation’ is used for this threshold.

Paragraph 7.3.2.2

This only applies where the external air temperature may cause freezing of the fire main. It is recommended that ‘lowest MDLT <0°C for the area and season of operation’ is used for this threshold.

The operating envelope definition should be used to define if freezing is likely externally and in internal compartments and validated during the Operational Assessment.

Paragraph 7.3.2.2 should be read in conjunction with SOLAS Chapter II-2, paragraph 10.2.1.1:

“Materials readily rendered ineffective by heat shall not be used for fire mains and hydrants unless adequately protected. The pipes and hydrants shall be so placed that the fire hoses may be easily coupled to them. The arrangement of pipes and hydrants shall be such as to avoid the possibility of freezing. Suitable drainage provisions shall be provided for fire main piping. Isolation valves shall be installed for all open deck fire main branches used for purposes other than fire fighting. In ships where deck cargo may be carried, the positions of the hydrants shall be such that they are always readily accessible and the pipes shall be arranged as far as practicable to avoid risk of damage by such cargo.”

CHAPTER 7 – FIRE SAFETY/PROTECTION

7.1 Goal

The goal of this chapter is 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.

7.2 Functional requirements

7.2.1 In order to achieve the goal set out in paragraph 7.1 above, the following functional requirements are embodied in the regulations of this chapter:

- .1 all components of fire safety systems and appliances if installed in exposed positions shall be protected from ice accretion and snow accumulation;
- .2 local equipment and machinery controls shall be arranged so as to avoid freezing, snow accumulation and ice accretion and their location to remain accessible at all time;
- .3 the design of fire safety systems and appliances shall take into consideration the need for persons to wear bulky and cumbersome cold weather gear, where appropriate;
- .4 means shall be provided to remove or prevent ice and snow accretion from accesses; and
- .5 extinguishing media shall be suitable for intended operation.

7.2.2 In addition, for ships intended to operate in low air temperature, the following apply:

- .1 all components of fire safety systems and appliances shall be designed to ensure availability and effectiveness under the polar service temperature; and
- .2 materials used in exposed fire safety systems shall be suitable for operation at the polar service temperature.

7.3 Regulations

7.3.1 In order to comply with the requirement of paragraph 7.2.1.1, the following apply:

- .1 isolating and pressure/vacuum valves in exposed locations are to be protected from ice accretion and remain accessible at all time; and
- .2 all two-way portable radio communication equipment shall be operable at the polar service temperature.

7.3.2 In order to comply with the requirement of paragraph 7.2.1.2, the following apply:

- .1 fire pumps including emergency fire pumps, water mist and water spray pumps shall be located in compartments maintained above freezing;
- .2 the fire main is to be arranged so that exposed sections can be isolated and means of draining of exposed sections shall be provided. Fire hoses and nozzles need not be connected to the fire main at all times, and may be stored in protected locations near the hydrants;

Commentary

Paragraph 7.3.2.4

Independent sea suction which are separate from the main sea suction referred to in 7.3.2.4 may be capable of being cleared of ice accumulation by provision of steam blowing. This regulation only applies if there is a likelihood of slush ice developing. It is recommended that a suitable threshold for this is 'water temperature in area of operation $\leq 0^{\circ}\text{C}$ '.

Paragraph 7.3.3.1

Protected locations in paragraph 7.3.3.1 are intended to be heated spaces to mitigate the risk of low air temperature. Note that standard MED-certified portable fire extinguishers are function tested at various temperature thresholds. For example, EN3-7 (Portable fire extinguishers) allows for water based extinguishers to be operable at a minimum temperature of $+5^{\circ}\text{C}$, 0°C , -5°C , -10°C , -15°C , -20°C , -25°C , -30°C or lower, depending on their level of protection against freezing.

Footnote 12 of paragraph 7.3.3.2

This cross refers to IACS UR S6 or Polar Class requirements. UR S6 is for hull structural members and is not relevant for application to materials for fire safety systems. The relevant section of IACS URI could be considered to be "I3.3.3 Material exposed to low air temperature". However, the content of UR I3 is applicable to main propulsion, steering gear, emergency and essential auxiliary systems essential for the safety of the ship and the survivability of the crew.

LR's winterisation rules provide further details on material classes for components of fire-fighting systems for ships intended to operate in low air temperatures. See LR's Winterisation Rules, Section 3.

.3 firefighter's outfits shall be stored in warm locations on the ship; and

.4 where fixed water-based firefighting systems are located in a space separate from the main fire pumps and use their own independent sea suction, this sea suction is to be also capable of being cleared of ice accumulation.

7.3.3 In addition, for ships intended to operate in low air temperature, the following apply:

.1 In order to comply with the requirement of paragraph 7.2.2.1, portable and semi portable extinguishers shall be located in positions protected from freezing temperatures, as far as practical. Locations subject to freezing are to be provided with extinguishers capable of operation under the polar service temperature.

.2 In order to comply with the functional requirements of paragraph 7.2.2.2 above, materials of exposed fire safety systems shall be approved by the Administration, or a recognized organization accepted by it, taking into account standards acceptable to the Organization¹² or other standards offering an equivalent level of safety based on the polar service temperature.

¹² Refer to IACS UR S6 Use of Steel Grades for Various Hull Members – Ships of 90 m in Length and Above (2013) or IACS URI Requirements concerning Polar Class (2011)

Commentary

Chapter 8 Goal and Functional requirements

Chapter 8 of the Code is the most reliant on the Operational Assessment to define additional requirements that supplement the extent of the prescriptive regulations in paragraph 8.3.

Chapter 8 requires the Operational Assessment ([paragraph 1.5](#)) to identify additional survival resources to support survival following abandoning ship to water, to ice or to land. In particular the following points are noted:

- In the Operational Assessment, the Code requires the scenario of abandonment to be considered. The argument that the ship itself is the best form of refuge cannot be used as a substitute
- The Operational Assessment should consider which scenarios are relevant with respect to abandoning to water, land or ice
- Land or ice are included together because it was anticipated that remote land may be an alternative refuge to remaining on the ice.

For ice strengthened ships it is anticipated that the Operational Assessment will identify the scenario of both water and ice abandonment. For ships that are not ice strengthened it is considered that generally the ice regimes that these ships will operate in (with respect to ice concentration and thickness) will not support abandonment to ice. For example, if ships are operating in open pack (seven tenths ice concentration) or less it is likely that the Operational Assessment will conclude that abandonment to water is the only scenario that needs consideration. The same argument could be applied if an ice strengthened ship is limited to operation in open pack where there risk of not being able to deploy the lifeboats onto water is mitigated.

In all cases it is recommended that the scenarios for abandonment that are identified in the Operational Assessment are included in the PWOM to assist in voyage planning and crew information.

The Code includes a general description of what the survival resources should provide in the functional requirement in paragraph 8.2.3.3. [Paragraph 8.3.3.3](#) defines the need to address the functional requirements by providing personal and group survival equipment. Part I-B, [Section 9](#) of the Code includes suggested content for personal and survival equipment. However, this is not mandatory content and it is the output of the Operational Assessment that should validate if the content of the Personal and Group Survival Kits (PSK / GSK) suggested in Part 1-B is suitable or if alternative / additional survival resources are required. Compliance is not achieved by specifying/providing GSKs and PSKs as described in Part 1-B as a means of meeting the regulations in [paragraph 8.3.3.3](#) without undertaking an assessment: the required survival resources must be determined/validated as part of the Operational Assessment.

CHAPTER 8 – LIFE-SAVING APPLIANCES AND ARRANGEMENTS

8.1 Goal

The goal of this chapter is to provide for safe escape, evacuation and survival.

8.2 Functional requirements

In order to achieve the goal set out in paragraph 8.1 above, the following functional requirements are embodied in the regulations of this chapter:

8.2.1 Escape

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

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

8.2.2 Evacuation

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.

8.2.3 Survival

8.2.3.1 Adequate thermal protection shall be provided for all persons on board, taking into account the intended voyage, the anticipated weather conditions (cold and wind), and the potential for immersion in polar water, where applicable.

8.2.3.2 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.

8.2.3.3 Taking into account the presence of any hazards, as identified in the assessment in chapter 1, 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;
- .5 safe access and exit points; and
- .6 means to communicate with rescue assets.

Commentary

Paragraph 8.3.1.

Paragraph 8.3.1.1 is only applicable to ships exposed to ice accretion. It is recommended that this threshold be aligned with [paragraph 4.2.1](#) of the Code.

Paragraph 8.3.1.2

Paragraph 8.3.1.2 applies to *exposed* escape route sizing – i.e. open deck and routes outside of internal accommodation spaces.

Paragraph 8.3.1.3

Suitable polar clothing has not been defined because it will vary between shipowner/operator and the environmental conditions. It is suggested that for ships where bulky / polar clothing is adopted this may increase the minimum required route width by approximately 100 mm.

Paragraph 8.3.2.1

The safe deployment of survival equipment referred to in paragraph 8.3.2.1 includes deployment of relevant survival resources identified in paragraph 8.3.3.2 in addition to SOLAS LSA equipment.

Paragraph 8.3.2.2

The requirement that devices requiring a source of power must be able to operate independently of the ship's main source of power applies also to deployment of survival resources.

Paragraph 8.3.3.1.2

This requires that if immersion suits are required by SOLAS or another IMO instrument or if they are provided as a means of fulfilling paragraph 8.3.3.1.1 they are to be of insulated type, it does not mandate immersion suit provision.

Paragraph 8.3.3.2

Extended periods of darkness, as a threshold for applying paragraph 8.3.2.2, should be determined as part of the operating envelope and validated during the Operational Assessment. The LSA Code requires lifeboats to be equipped with a light as follows:

"4.4.7.10 A manually controlled exterior light shall be fitted. The light shall be white and be capable of operating continuously for at least 12 h with a luminous intensity of not less than 4.3 cd in all directions of the upper hemisphere. However, if the light is a flashing light it shall flash at a rate of not less than 50 flashes and not more than 70 flashes per min for the 12 h operating period with an equivalent effective luminous intensity."

As such, a recommended threshold for extended periods of darkness could be operation in over 12 hrs of darkness. This may lead to specifying additional battery life and luminous intensity. Note that battery life decreases at low temperature.

8.3 Regulations

8.3.1 Escape

In order to comply with the functional requirements of paragraphs 8.2.1.1 and 8.2.1.2 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.

8.3.2 Evacuation

In order to comply with the functional requirement of paragraph 8.2.2 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.

8.3.3 Survival

8.3.3.1 In order to comply with the functional requirement of paragraph 8.2.3.1 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.

8.3.3.2 In addition, for ships intended to operate in extended periods of darkness, in order to comply with the functional requirements of paragraph 8.2.3.2 above, searchlights suitable for continuous use to facilitate identification of ice shall be provided for each lifeboat.

Commentary

Paragraph 8.3.3.3

Although not explicit in this Chapter, the performance requirements in paragraph 1.4 of the Code apply, in particular paragraph 1.4.3. i.e. for ships intending to operate in low air temperature, survival equipment (and means to deploy it) should be functional at the PST.

In this context it should be noted that section 1.2.2 of the LSA Code requires life-saving appliances to be operational to -15°C (and not to be damaged in stowage down to -30°C):

“1.2.2 Unless expressly provided otherwise or unless, in the opinion of the Administration having regard to the particular voyages on which the ship is constantly engaged, other requirements are appropriate, all life-saving appliances prescribed in this part shall:

- .2 not be damaged in stowage throughout the air temperature range -30°C to +65°C and, in the case of personal life-saving appliances, unless otherwise specified, remain operational throughout the air temperature range -15°C to +40°C;”

In principle any ship intended to operate in low air temperature (assigned a PST) will require LSA equipment tested to the PST temperature (i.e. below the “normal” SOLAS testing requirements).

Paragraph 8.3.3.4

The development of the Polar Code assumed that current rations as required by the LSA Code (Section 4.1.5.18 and 4.1.5.19) would be adequate for the minimum “maximum expected time to rescue” of five days. For ships where the maximum ETR is above five days and/or if the ship is intended to operate in low air temperature (where higher calorific content may be required for survival) additional emergency rations are to be considered. However, there is no clear indication in SOLAS or the LSA Code in terms of the intended survival time associated with the emergency rations required under the LSA Code. The IMO is currently updating SOLAS Chapter III to include functional requirements that are expected to explicitly state the assumed “time to rescue” for SOLAS ships.

It is to be noted that where the Operational Assessment identifies various scenarios for abandonment which are associated with different maximum ETRs (i.e. a longer period survival required if trapped in ice as opposed to in lifeboats in open water) the provision and distributions of survival resources, including emergency rations, may reflect this. i.e. if the maximum ETR for the abandonment scenario to water is five days whereas the maximum ETR for abandonment to ice is 10 days, then the equipment used for the water abandonment (i.e. life raft and/or lifeboat) need only be equipped with emergency rations adequate for that scenario and its associated ETR, provided that emergency rations aligned with the maximum ETR on the certificate are carried on board.

8.3.3.3 In order to comply with the functional requirement of paragraph 8.2.3.3 above, the following apply:

- .1 no lifeboat shall be of any type other than partially or totally enclosed type;
- .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; and
- .3 in addition, whenever the assessment required under paragraph 1.5 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.

8.3.3.4 In order to comply with the functional requirement of paragraph 8.2.3.3.4 above, adequate emergency rations shall be provided, for the maximum expected time of rescue.

Commentary

Paragraph 9.3.1

The requirement for receiving up to date ice conditions is applicable to all ships. The requirement can be met by provision of an internet connection or the ability to receive emails.

Paragraph 9.3.2.1

This applies to all ice strengthened ships as it is considered that they are more likely to have transducer damage by ice and, given the lack of comprehensive depth soundings in some polar regions, this increases the hazard of grounding.

Paragraph 9.3.2.1.2

SOLAS Chapter V, Regulation 22.1 indicates:

“9.4 A clear view through at least two of the navigation bridge front windows and, depending on the bridge configuration, an additional number of clear-view windows shall be provided at all times, regardless of weather conditions.”

In SOLAS this requirement is for ships of not less than 55 metres length and constructed on or after 1 July 1998.

For polar ships, the key aspect of 19.4 is “regardless of the weather conditions”. As such additional provision of window clearing systems shall be provided, which may include:

- provision of systems to clean windows at low temperature
- provision of systems to prevent icing of windows (by heating).

It is suggested that a suitable threshold to meet the functionality required under the expected environmental conditions in the area of operation referred to in paragraph 9.2.2.1 would be ‘ships likely subject to ice accretion’.

See commentary on [paragraph 4.2.1](#).

CHAPTER 9 – SAFETY OF NAVIGATION

9.1 Goal

The goal of this chapter is to provide for safe navigation.

9.2 Functional requirements

In order to achieve the goal set out in paragraph 9.1 above, the following functional requirements are embodied in the regulations of this chapter.

9.2.1 Nautical information

Ships shall have the ability to receive up-to-date information including ice information for safe navigation.

9.2.2 Navigational equipment functionality

9.2.2.1 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.

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

9.2.3 Additional navigational equipment

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

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

9.3 Regulations

9.3.1 Nautical information

In order to comply with the functional requirement of paragraph 9.2.1 above, ships shall have means of receiving and displaying current information on ice conditions in the area of operation.

9.3.2 Navigational equipment functionality

9.3.2.1 In order to comply with the functional requirement of paragraph 9.2.2.1 above, the following apply:

.1 ships constructed on or after 1 January 2017, ice strengthened in accordance with chapter 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;

Commentary

Paragraph 9.3.2.1.3

The extent of means to prevent ice accumulation on antennas is applicable to antennas for navigation equipment required by SOLAS, notably Chapters IV and V.

Paragraph 9.3.2.2.1

The two non-magnetic means to determine heading may be met by:

- Gyro compass
- GNSS (Digital GPS, Glonass, Gaelileo).

Paragraph 9.3.3.1

This applies to all ships regardless of whether they intend to operate in ice, the rationale being that searchlights are to be used to avoid operating in ice.

Paragraph 9.3.3.2

The flashing red light required by paragraph 9.3.3.2 is required for ships intended to operate under escort in the polar regions. Provision of this light should be taken into account in combination with any regional or national requirements for sea areas where icebreaker escort is provided, as the operating techniques, procedures and means of communication vary between jurisdictions. Use of additional navigational / signalling equipment should be described in the PWOM.

For prescription of horizontal and vertical arcs of visibility see Annex I of COLREGS.

- .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:
 - .1 where equipment required by SOLAS chapter V or this chapter have sensors that project below the hull, such sensors shall be protected against ice; and
 - .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.

9.3.2.2 In order to comply with the functional requirement of paragraph 9.2.2.2 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.

9.3.3 Additional navigational equipment

9.3.3.1 In order to comply with the functional requirement of paragraph 9.2.3.1 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.

9.3.3.2 In order to comply with the functional requirement of paragraph 9.2.3.2, 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.

Commentary

Paragraph 10.3.1.2

The International Code of Signals does not provide a description of the sound signalling system but describes the signals to be used when encountering ice or under icebreaker escort.

See Chapter 1, Section 7 and Chapter 2, Section 6 of the Code of Signals. For description of appropriate sound signalling devices see Annex III of COLREGS, Section 1. (Whistles).

CHAPTER 10 – COMMUNICATION

10.1 Goal

The goal of this chapter is to provide for effective communication for ships and survival craft during normal operation and in emergency situations.

10.2 Functional requirements

In order to achieve the goal set out in paragraph 10.1 above, the following functional requirements are embodied in the regulations of this chapter.

10.2.1 Ship communication

10.2.1.1 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.

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

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

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

10.2.2 Survival craft and rescue boat communications capabilities

10.2.2.1 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.

10.2.2.2 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.

10.2.2.3 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 Regulations

10.3.1 Ship communication

10.3.1.1 In order to comply with the functional requirements of paragraph 10.2.1.1 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.

10.3.1.2 In order to comply with the functional requirements of paragraph 10.2.1.2 above, ships intended to provide icebreaking escort shall be equipped with a sound signaling system mounted to face astern to indicate escort and emergency manoeuvres to following ships as described in the International Code of Signals.

Commentary

Paragraphs 10.3.1.3 and 10.3.1.4

There are no special communication devices associated with paragraphs 10.3.1.3.1 and 10.3.1.4. Telemedical assistance services can be accessed through marine radio, email, telephone or fax. The local Maritime Rescue Coordination Centre (MRCC) should be identified for the anticipated areas of operation and the means of communication with the MRCC(s) confirmed. It is recommended that means of contact are included in the PWOM.

Paragraphs 10.3.2.1 and 10.3.2.2

In interpreting the requirements for 10.3.2.1 and 10.3.2.2 the following more common terms are described:

- device for transmitting ship to shore alerts – typically EPIRB
- device for transmitting signals for location – typically SART
- device for transmitting and receiving on-scene communications – typically VHF radio.

Paragraph 10.3.2.3

This is intended to indicate that procedures should be contained in the PWOM where communication equipment is turned on at specific, pre-agreed intervals during rescue to preserve battery life.

10.3.1.3 In order to comply with the functional requirements of paragraph 10.2.1.3 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.

10.3.1.4 In order to comply with the functional requirements of paragraph 10.2.1.4 above, the communication equipment shall provide for two-way voice and data communication with a Telemedical Assistance Service (TMAS).

10.3.2 Survival craft and rescue boat communications capabilities

10.3.2.1 For ships intended to operate in low air temperature, in order to comply with the functional requirements of paragraph 10.2.2.1 above, all rescue boats and lifeboats, whenever released for evacuation, shall:

- .1 for distress alerting, carry one device for transmitting ship to shore alerts;
- .2 in order to be located, carry one device for transmitting signals for location; and
- .3 for on-scene communications, carry one device for transmitting and receiving on-scene communications.

10.3.2.2 For ships intended to operate in low air temperature, in order to comply with the functional requirements of paragraph 10.2.2.2 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.

10.3.2.3 In order to comply with the functional requirements of paragraph 10.2.2.3 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.

Commentary

Chapter 11

The intention of Chapter 11 is to outline considerations for voyage planning undertaken before every voyage in polar waters. Whereas the Operational Assessment and PWOM are intended to establish procedures for operating in the polar regions identified by the operator, the Polar Code requires the Master to undertake a voyage plan using the PWOM content and information described in paragraph 11.3.

It is recommended that when developing the PWOM consideration is given to providing the Master with appropriate information to align with paragraph 11.3 in advance, for the operational areas identified in the Operational Assessment.

CHAPTER 11 – VOYAGE PLANNING

11.1 Goal

The goal of this chapter is 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.

11.2 Functional requirement

In order to achieve the goal set out in paragraph 11.1 above, the voyage plan shall take into account the potential hazards of the intended voyage.

11.3 Requirements

In order to comply with the functional requirement of paragraph 11.2 above, 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 densities of marine mammals, including seasonal migration areas;¹³
- .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;¹⁴
- .8 national and international designated protected areas along the route; and
- .9 operation in areas remote from search and rescue (SAR) capabilities¹⁵.

¹³ Refer to MEPC/Circ.674 on Guidance document for minimizing the risk of ship strikes with cetaceans.

¹⁴ Refer to MEPC/Circ.674 on Guidance document for minimizing the risk of ship strikes with cetaceans.

¹⁵ Refer to MSC.1/Circ.1184 on Enhanced contingency planning guidance for passenger ships operating in areas remote from SAR facilities and A.999(25) on Guidelines on voyage planning for passenger ships operating in remote areas.

Commentary

Paragraph 12.2

Amendments to the STCW convention have been prepared and include updates to:

- STCW Chapter 1 – General Provisions and
- STCW Chapter V (Special training requirements for personnel on certain types of ships) where a new Regulation 4 is introduced.

The amendments enter into force from 1 January, 2018. KPUs for the basic and advanced course have been approved at the IMO and development of model courses in the new IMO format is expected to conclude by the end of 2016.

Paragraph 12.3.1

In interpreting the Table for qualifications it should be noted that “open waters” as defined by the Code means a 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. Therefore, in all but the summer season, the majority of polar waters can be considered as “other waters”. This distinction is recorded on the PSC. It is recommended that the applicability of open waters or other waters is identified in the Operational Assessment.

CHAPTER 12 – MANNING AND TRAINING

12.1 Goal

The goal of this chapter is to ensure that ships operating in polar waters are appropriately manned by adequately qualified, trained and experienced personnel.

12.2 Functional requirements

In order to achieve the goal set out in paragraph 12.1 above, companies shall ensure that masters, chief mates and officers in charge of a navigational watch on board ships operating in polar waters shall have completed training to attain the abilities that are appropriate to the capacity to be filled and duties and responsibilities to be taken up, taking into account the provisions of the STCW Convention and the STCW Code, as amended.

12.3 Regulations

12.3.1 In order to meet the functional requirement of paragraph 12.2 above while operating in polar waters, masters, chief mates and officers in charge of a navigational watch shall be qualified in accordance with chapter V of the STCW Convention and the STCW Code, as amended, as follows:

Ice conditions	Tankers	Passenger ships	Other
Ice free	Not applicable	Not applicable	Not applicable
Open waters	Basic training for master, chief mate and officers in charge of a navigational watch	Basic training for master, chief mate and officers in charge of a navigational watch	Not applicable
Other waters	Advanced training for master and chief mate. Basic training for officers in charge of a navigational watch	Advanced training for master and chief mate. Basic training for officers in charge of a navigational watch	Advanced training for master and chief mate. Basic training for officers in charge of a navigational watch

12.3.2 The Administration may allow the use of a person(s) other than the master, chief mate or officers of the navigational watch to satisfy the requirements for training, as required by paragraph 12.3.1, provided that:

- .1 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 the above table;
- 2 while operating in polar waters the ship has sufficient number of persons meeting the appropriate training requirements for polar waters to cover all watches;
- .3 this person(s) is subject to the Administration’s minimum hours of rest requirements at all times;
- .4 when operating in waters other than open waters or bergy waters, the master, chief mate and officers in charge of a navigational watch on passenger ships and tankers shall meet the applicable basic training requirements noted in the above table; and
- .5 when operating in waters with ice concentration of more than 2/10, the master, chief mate and officers in charge of a navigational watch on cargo ships other than tankers shall meet the applicable basic training requirements noted in the above table.

12.3.3 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.

12.3.4 Every crew member shall be made familiar with the procedures and equipment contained or referenced in the PWOM relevant to their assigned duties.

Commentary

Part I-B

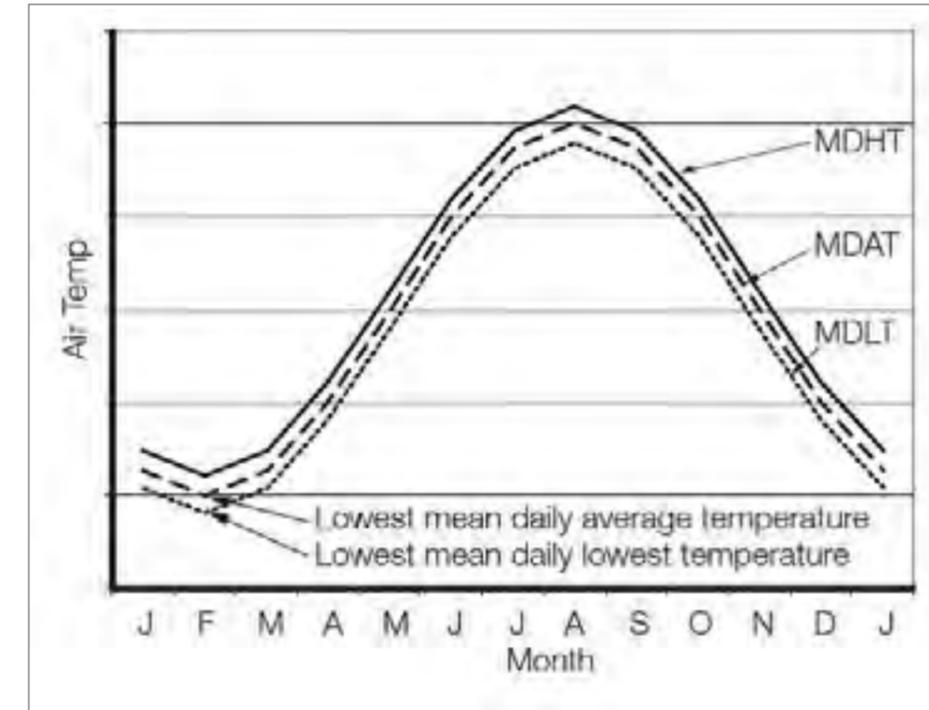
Part I-B provides additional guidance on the Introduction and Part I-A of the Code. Part I-B is not mandatory. The contents may be considered as useful supporting information to assist in applying the Code. However, the use of wording such as “should” in Part I-B may be considered as recommendatory phrasing and is not intended to form part of supplementary or complementary requirements.

Additional Guidance to Section 2 of the Introduction

The figure illustrates the concept of Mean Daily Lowest Temperature used in the Polar Code to determine the PST and the threshold for a ship being considered to operate in low air temperature.

ADDITIONAL GUIDANCE REGARDING THE PROVISIONS OF THE INTRODUCTION AND PART I-A

1 ADDITIONAL GUIDANCE TO SECTION 2 (DEFINITIONS) OF THE INTRODUCTION



Definitions used in the figure above

MDHT – Mean Daily High Temperature

MDAT – Mean Daily Average Temperature

MDLT – Mean Daily Low Temperature

Guidance instructions for determining MDLT:

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

Commentary

Additional Guidance to Chapter 1 – Limitations for operating in ice

The text regarding limitations for operating in ice should be considered in the context of MSC.1/Circ.1519 – Guidance on Methodologies for Assessing Operational Capabilities and Limitations in Ice.

Paragraphs 1.1, 1.2 and 1.3 were developed before the MSC Circular, which expands on the guidance provided. As such it may be considered that guidance in paragraphs 1.1, 1.2 and 1.3 are superseded by MSC.1/Circ.1519.

Additional Guidance to Chapter 1 – Operational Assessment

Paragraphs 2.1 and 2.2 provide a general outline in terms of steps considered appropriate for the Operational Assessment. The footnote references MSC-MEPC.2/Circ.12, which provides a description of a range of risk assessment techniques and tools. Shipowners and operators undertaking the Operational Assessment may wish to be guided by the content of 2.1, 2.2 and MSC-MEPC.2/Circ.12. However, the scope and extent of the Operational Assessment should be tailored to the anticipated operations and aligned with the operator's Safety Management System – i.e. the process by which operators develop and maintain onboard procedures.

See also the commentary on [Operational Assessment](#) in "important concepts".

LR has developed further guidance on the Operational Assessment, including structured steps which, recognising the risk assessment techniques that are available, are considered to be more closely aligned with the necessary format needed for operators and shipowners to make the appropriate decisions and present them to the administration.

To assist shipowners and operators in undertaking the Operational Assessment, LR has developed guidance documents and templates to guide you through the process, available at www.lr.org/polarcode

2 ADDITIONAL GUIDANCE TO CHAPTER 1 (GENERAL)

1 Limitations for operating in ice

- 1.1 Limitations for operation in ice can be determined using systems, tools or analysis that evaluate the risks posed by the anticipated ice conditions to the ship, taking into account factors such as its ice class, seasonal changing of ice strength, icebreaker support, ice type, thickness and concentration. The ship's structural capacity to resist ice load and the ship's planned operations should be considered. The limitations should be incorporated into an ice operational decision support system.
- 1.2 Limitations for operating in ice should be determined using an appropriate methodology, such methodologies exist, have been in use for a number of years and have been validated with service experience. Existing methodologies and other systems may be acceptable to the Administration.
- 1.3 Operation in ice should take into account any operational limitations of the ship; extended information on the ice operational methodology contained in the PWOM; the condition of the ship and ship's systems, historical weather/ice data and weather/ice forecasts for the intended area of operation, current conditions including visual ice observations, sea state, visibility and the judgment of qualified personnel.

2 Operational assessment

- 2.1 This guidance is intended to support shipowners carrying out, and Administrations reviewing, the assessment required in part I-A, section 1.5, for operational limitations and procedures for the Polar Ship Certificate.
- 2.2 Steps for an operational assessment:
 - .1 identify relevant hazards from section 3 of the Introduction and other hazards based on a review of the intended operations;
 - .2 develop a model¹⁶ to analyze risks considering:
 - .1 development of accident scenarios;
 - .2 probability of events in each accident scenario; and
 - .3 consequence of end states in each scenario;
 - .3 assess risks and determine acceptability:
 - .1 estimate risk levels in accordance with the selected modelling approach; and
 - .2 assess whether risk levels are acceptable; and
 - .4 in the event that risk levels determined in steps 1 to 3 are considered to be too high, identify current or develop new risk control options that aim to achieve one or more of the following:
 - .1 reduce the frequency of failures through better design, procedures, training, etc.;
 - .2 mitigate the effect of failures in order to prevent accidents;
 - .3 limit the circumstances in which failures may occur; or
 - .4 mitigate consequences of accidents; and
 - .5 incorporate risk control options for design, procedures, training and limitations, as applicable.

¹⁶ Reference is made to the techniques in appendix 3 of the Revised guidelines for Formal Safety Assessment (FSA) for use in the IMO Rule-Making Process (MSC-MEPC.2/Circ.12) and standard IEC/ISO 31010 "Risk management – Risk assessment techniques"

Commentary

Additional Guidance to Chapter 1 – Performance Standards

Although contained in the guidance part, section 3 of Part I-B provides guidance on addressing the issue that there are, as yet, few consistently accepted performance standards for evaluating the acceptability of equipment and systems intended to operate in low air temperature. As such, existing systems have been designed and built to a range of certification standards. In addition, service experience may be used to support acceptance of equipment.

Additional Guidance to Chapter 2 – Guidance on navigation with icebreaker assistance

While Part I-B, Section 3.2, provides useful supporting information on operating with icebreaker assistance, local and national requirements and instructions may be different or may apply in addition to the guidance provided in 3.2. It is recommended that local jurisdictional requirements and instructions are identified based on the anticipated areas of operation and that this information is cross referenced in the PWOM.

3 Performance standards

A system previously accepted based on manufacturer certifications, classification society certifications and/or satisfactory service of existing systems may be acceptable for installation on new and existing ships if no performance or testing standards are accepted by the Organization.

3 ADDITIONAL GUIDANCE TO CHAPTER 2 (POLAR WATER OPERATIONAL MANUAL (PWOM))

3.1 Recommendation on the content of the Polar Water Operational Manual

The Polar Water Operational Manual (PWOM) is intended to address all aspects of operations addressed by chapter 2 of part I-A. When appropriate information, procedures or plans exist elsewhere in a ship's documentation, the PWOM itself does not need to replicate this material, but may instead cross-reference the relevant reference document.

A model Table of Contents is found in appendix 2.

The model follows the general structure of chapter 2. Not every section outlined below will be applicable to every polar ship. Many Category C ships that undertake occasional or limit polar voyages will not need to have procedures for situations with a very low probability of occurrence. However, it may still be advisable to retain a common structure for the PWOM as a reminder that if assumptions change then the contents of the manual may also need to be updated. Noting an aspect as "not applicable" also indicates to the Administration that this aspect has been considered and not merely omitted.

3.2 Guidance on navigation with icebreaker assistance

With respect to navigation with icebreaker assistance, the following should be considered:

- .1 while approaching the starting point of the ice convoy to follow an icebreaker/icebreakers or in the case of escorting by icebreaker of one ship to the point of meeting with the icebreaker, ships should establish radio communication on the VHF channel 16 and act in compliance with the icebreaker's instructions;
- .2 the icebreaker rendering the icebreaker assistance of ship ice convoy should command ships in the ice convoy;
- .3 position of a ship in the ice convoy should be determined by the icebreaker rendering the assistance;
- .4 ship within the ice convoy, in accordance with the instructions of the icebreaker rendering the assistance, should establish communication with the icebreaker by VHF channel indicated by the icebreaker;
- .5 the ship, while navigating in the ice convoy, should ensure compliance with the instructions of the icebreaker;
- .6 position in the ice convoy, speed and distance to a ship ahead should be as instructed by the icebreaker;
- .7 the ship should immediately notify the icebreaker of any difficulties to maintain the position within the ice convoy, speed and/or distance to any other ship in the ice convoy; and
- .8 the ship should immediately report to the icebreaker of any damage.

3.3 Guidance on the development of contingency plans

In developing the ship's contingency plans ships should consider damage control measures arrangements for emergency transfer of liquids and access to tanks and spaces during salvage operations.

See also additional guidance to Chapter 9.

Commentary

Additional Guidance to Chapter 3 – Method for determining equivalent ice class

Part I-B, Section 4, provides an outline of a methodology to establish an “equivalent level of safety” required by Chapter 3 and Chapter 6 for assigning ship Categories to ships with alternative ice classes to the IACS Polar Classes.

It is recommended that when considering “equivalent level of safety” for existing ships with alternative ice classes to the IACS Polar Classes, the classification society assigning the alternative ice class is engaged to agree the detailed methodology to establish the ship Category to be assigned on a case-by-case basis.

4 ADDITIONAL GUIDANCE TO CHAPTER 3 (SHIP STRUCTURE)

Method for determining equivalent ice class

- 1 The guidance presented below is intended to assist in determining equivalency with standards acceptable to the Organization, as referenced in chapters 3 and 6 of the Code. The methodology is consistent with guidance developed by the Organization¹⁷ while allowing for the use of a simplified approach.
- 2 The basic approach for considering equivalency for Categories A and B ships can be the same for both new and existing ships. It involves comparing other ice classes to the IACS Polar Classes. For ice classes under Category C, additional information on comparisons of strengthening levels is available for the guidance of owners and Administrations¹⁸. The responsibility for generating the equivalency request and supporting information required should rest with the owner/operator. Review/approval of any equivalency request should be undertaken by the flag State Administration, or by a recognized organization acting on its behalf under the provisions of the Code for Recognized Organizations (RO Code). Several classification societies have developed easy-to-use tools for determination of compliance with the IACS Polar Class structural requirements, as have some Administrations and other third parties.
- 3 The scope of a simplified equivalency assessment (referring to paragraphs 6.1 to 6.3 below) is expected to be limited to materials selection, structural strength of the hull and propulsion machinery.
- 4 If there is not full and direct compliance, then an equivalent level of risk can be accepted in accordance with guidance provided by the Organization. An increase in the probability of an event can be balanced by a reduction in its consequences. Alternatively, a reduction in probability could potentially allow acceptance of more serious consequences. Using a hull area example, a local shortfall in strength level or material grade could be accepted if the internal compartment is a void space, for which local damage will not put the overall safety of the ship at risk or lead to any release of pollutants.
- 5 For existing ships, service experience can assist in risk assessment. As an example, for an existing ship with a record of polar ice operations a shortfall in the extent of the ice belt (hull areas) may be acceptable if there is no record of damage to the deficient area; i.e. a ship that would generally meet PC 5 requirements but in limited areas is only PC 7 could still be considered as a Category A, PC 5 ship. In all such cases, the ship’s documentation should make clear the nature and scope of any deficiencies.
- 6 The process includes the following stages of assessment:
 - .1 select the target Polar Class for equivalency;
 - .2 compare materials used in the design with minimum requirements under the IACS Polar Class URs; identify any shortfalls; and
 - .3 compare strength levels of hull and machinery components design with requirements under the IACS Polar Class URs; quantify levels of compliance.
- 7 Where gaps in compliance are identified in steps 1 to 3, additional steps should be necessary to demonstrate equivalency, as outlined below:
 - .4 identify any risk mitigation measures incorporated in the design of the ship (over and above the requirements of the Code and IACS URs);
 - .5 where applicable, provide documentation of service experience of existing ships, in conditions relevant to the target ice class for equivalency; and
 - .6 undertake an assessment, taking into account information from steps 1 to 5, as applicable, and on the principles outlined in paragraphs 2 to 6 above.

¹⁷ Refer to the Guidelines for the approval of alternatives and equivalents as provided for in various IMO instruments (MSC.1/Circ.1455)

¹⁸ Refer to the annex to HELCOM Recommendation 25/7, Safety of Winter Navigation in the Baltic Sea Area, available at www.helcom.fi

No Commentary

8 Documentation provided with an application for equivalency should identify each stage that has been undertaken, and sufficient supporting information to validate assessments.

9 Where a ship in Categories A or B is provided with an equivalency for ice class by its flag State, this should be noted in its Polar Ship Certificate.

5 ADDITIONAL GUIDANCE TO CHAPTER 4 (SUBDIVISION AND STABILITY)

No additional guidance.

6 ADDITIONAL GUIDANCE TO CHAPTER 5 (WATERTIGHT AND WEATHERTIGHT INTEGRITY)

No additional guidance.

7 ADDITIONAL GUIDANCE TO CHAPTER 6 (MACHINERY INSTALLATIONS)

Refer to additional guidance to chapter 3.

8 ADDITIONAL GUIDANCE TO CHAPTER 7 (FIRE SAFETY AND PROTECTION)

No additional guidance.

Commentary

Additional Guidance to Chapter 8 – Sample personal and group survival equipment

It is important to note that the kit content for both the PSK and GSK are examples / samples. The actual content of the kits will depend on the outcome of the Operational Assessment after establishing appropriate survival resources.

The content of PSKs / GSKs may be used as guidance. However, the Operational Assessment may mean that supplementary equipment is required to be carried in addition to, or in lieu of, the content outlined in Part I-B, 9.1.

9 ADDITIONAL GUIDANCE TO CHAPTER 8 (LIFE-SAVING APPLIANCES AND ARRANGEMENTS)

9.1 Sample personal survival equipment

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

Suggested Equipment
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

9.2 Sample group survival equipment

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

Suggested Equipment
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
Water containers & water purification tablets
Spare set of personal survival equipment
Group survival equipment container (waterproof and floatable)

No commentary

10 ADDITIONAL GUIDANCE TO CHAPTER 9 (SAFETY OF NAVIGATION)

- 10.1 Radars equipped with enhanced ice detection capability should be promoted used, in particular, in shallow waters.
- 10.2 As the chart coverage of polar waters in many areas may not currently be adequate for coastal navigation, navigational officers should:
- .1 exercise care to plan and monitor their voyage accordingly, taking due account of the information and guidance in the appropriate nautical publications;
 - .2 be familiar with the status of hydrographic surveys and the availability and quality of chart information for the areas in which they intend to operate;
 - .3 be aware of potential chart datum discrepancies with GNSS positioning; and
 - .4 aim to plan their route through charted areas and well clear of known shoal depths, following established routes whenever possible.
- 10.3 Any deviations from the planned route should be undertaken with particular caution. For example, and when operating on the continental shelf:
- .1 the echo-sounder should be working and monitored to detect any sign of unexpected depth variation, especially when the chart is not based on a full search of the sea floor; and
 - .2 independent cross-checking of positioning information (e.g. visual and radar fixing and GNSS) should be undertaken at every opportunity. Mariners should ensure to report to the relevant charting authority (Hydrographic Office) any information that might contribute to improving the nautical charts and publications.
- 10.4 Ships should be fitted with:
- .1 a suitable means to de-ice sufficient conning position windows to provide unimpaired forward and astern vision from conning positions; and
 - .2 an efficient means of clearing melted ice, freezing rain, snow, mist and spray from outside and accumulated condensation from inside. A mechanical means to clear moisture from the outside face of a window should have operating mechanisms protected from freezing or the accumulation of ice that would impair effective operation.

11 ADDITIONAL GUIDANCE TO CHAPTER 10 (COMMUNICATION)

- 11.1 Limitations of communication systems in high latitude
- 11.1.1 Current maritime digital communication systems were not designed to cover Polar waters.
- 11.1.2 VHF is still largely used for communication at sea, but only over short distances (line of sight) and normally only for voice communication. HF and MF are also used for emergency situations. Digital VHF, mobile phone systems and other types of wireless technology offer enough digital capacity for many maritime applications, but only to ships within sight of shore based stations, and are, therefore, not generally available in polar waters. AIS could also be used for low data-rate communication, but there are very few base stations, and the satellite-based AIS system is designed for data reception only.

No commentary

11.1.3 The theoretical limit of coverage for GEO systems is 81.3° north or south, but instability and signal dropouts can occur at latitudes as low as 70° north or south under certain conditions. Many factors influence the quality of service offered by GEO systems, and they have different effects depending on the system design.

11.1.4 Non-GMDSS systems may be available and may be effective for communication in polar waters.

11.2 Advice for the operation of multiple alerting and communication devices in the event of an incident

A procedure should be developed to ensure that when survival craft are in close proximity, not more than two alerting or locating devices are activated (as required by regulation 10.3.2) at the same time. This is to:

- .1 preserve battery life;
- .2 enable extended periods of time for the transmission of alerting or locating signals; and
- .3 avoid potential interference.

11.3 For satellite distress beacons, although multiple beacon transmissions can be detected successfully by the satellite system, it is not recommended to activate multiple beacons, unless the survival craft operating the beacons are widely dispersed, as this can cause interference on direction-finding equipment.

11.4 Advice on location and communication equipment to be carried by rescue boats and survival craft

In determining the equipment to be carried for transmitting signals for location, the capabilities of the search and rescue resources likely to respond should be borne in mind. Responding ships and aircraft may not be able to home to 406/121.5 MHz, in which case other locating devices (e.g. AIS-SART) should be considered.

12 ADDITIONAL GUIDANCE TO CHAPTER 11 (VOYAGE PLANNING)

In developing and executing a voyage plan ships should consider the following:

- .1 in the event that marine mammals are encountered, any existing best practices should be considered to minimize unnecessary disturbance; and
- .2 planning to minimize the impact of the ship's voyage where ships are trafficking near areas of cultural heritage and cultural significance.

See also additional guidance to Chapter 9.

13 ADDITIONAL GUIDANCE TO CHAPTER 12 (MANNING AND TRAINING)

No additional guidance.

Commentary

Part II-A

Part II-A includes additional requirements to MARPOL for ships operating in polar waters. The Part is structured so that each Chapter is associated with an Annex of MARPOL. Each chapter should be read in addition to the relevant MARPOL Annex.

The content of Part II-A is prescriptive and is not goal based. There are no means to apply for alternatives to the requirements in Part II-A. It should be noted that Resolution MEPC.265(68) includes amendments to Annexes I, II, IV and V of MARPOL and should be read alongside the chapters of this part until a consolidated version of MARPOL is published that includes the amendments. In general, however, the amendments to MARPOL cover only application of requirements; text to link the Polar Code with the various Annexes; and amendments, where required, to MAPROL documentation and certificates.

It should be noted that, in accordance with Resolution MEPC.265(68) paragraph 3, the amendments to MARPOL enter into force on 1 January 2017. This means that Part II-A applies to all vessels – new and existing ships – which intend to operate in polar waters on or after 1 January 2017. There is no grace period for existing ships because all of the Part II-A requirements applicable to existing ships (i.e. all requirements which are not caveated with ships “constructed on or after 1 January 2017”) are operational in nature and are deemed not to require any structural changes to the ship.

Paragraph 1.1.1

This indicates that discharge into the sea of oil or oily mixtures from any ship is prohibited. Because this is an addition to MARPOL, the definition of oil and oily mixtures should be taken from the relevant definition in MARPOL, in this case MARPOL Annex I, Regulation 1.1 for the definition of oil and Annex I, Regulation 1.3 for the definition of oily mixture.

“1 Oil means petroleum in any form including crude oil, fuel oil, sludge, oil refuse and refined products (other than those petrochemicals which are subject to the provisions of Annex II of the present Convention) and, without limiting the generality of the foregoing, includes the substances listed in appendix I to this Annex.

3 Oily mixture means a mixture with any oil content.”

Note that the text in paragraph 1.1.1 indicates “Arctic waters”. This is because discharge of oil or oily mixture in the Antarctic is already prohibited under Annex I, Chapter 3, Regulation 15.4 of MARPOL. As such, paragraph 1.1.1 prohibits discharge of mixture with any oil content from 1 January 2017 for all ships operating in polar regions except those exempt under paragraph 1.1.3. This means 0 ppm discharge.

Paragraph 1.1.3

This provides a grace period specifically for Category A ships – such as icebreakers – where, due to their potential long range of operation in remote areas (away from reception facilities) it may not be possible to retain all oil and oily mixtures on board without a refit where existing tanks are redesignated / reequipped as oily mixture holding tanks.

Paragraph 1.1.4

In relation to paragraph 1.1.4, amendments have been made to the supplement to the International Oil Pollution Prevention Certificate (IOPP Certificate) Forms A and B in the amendments to MARPOL. Guidance for issuing updated certificates is included in MEPC.1/Circ.856 – Guidance for Issuing Revised Certificates, Manual and Record Books under Annexes I, II and V of MARPOL for Compliance with the Environment-Related Requirements of the Polar Code.

Paragraph 1.2

The intention of paragraph 1.2 is to ensure a similar level of oil fuel tank protection to that currently provided for oil tanks of oil tankers in Annex I for all ships operating in polar waters.

CHAPTER 1 – PREVENTION OF POLLUTION BY OIL

1.1 Operational requirements

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

1.1.2 The provisions of paragraph 1.1.1 shall not apply to the discharge of clean or segregated ballast.

1.1.3 Subject to the approval of the Administration, a Category A ship constructed before 1 January 2017 that cannot comply with paragraph 1.1.1 for oil or oily mixtures from machinery spaces and isoperating continuously in Arctic waters for more than 30 days shall comply with paragraph 1.1.1 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.

1.1.4 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.

1.2 Structural requirements

1.2.1 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.

1.2.2 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.

1.2.3 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.

1.2.4 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.

Commentary

Paragraph 2.1.3

The intention of 2.1.3 is to limit carriage of NLS against the side shell for ships operating in polar waters.

Chapter 2.1.2 of the IBC Code defines ship types. Chapter 2.6 of the IBC Code describes the tank protection for each ship type:

“2.6.1 Cargo tanks shall be located at the following distances inboard:

- .1 Type 1 ships: from the side shell plating, not less than the transverse extent of damage specified in 2.5.1.1.2, and from the moulded line of the bottom shell plating at centreline, not less than the vertical extent of damage specified in 2.5.1.2.3, and nowhere less than 760 mm from the shell plating. This requirement does not apply to the tanks for diluted slops arising from tank washing.
- .2 Type 2 ships: from the moulded line of the bottom shell plating at centreline, not less than the vertical extent of damage specified in 2.5.1.2.3, and nowhere less than 760 mm from the shell plating. This requirement does not apply to the tanks for diluted slops arising from tank washing.
- .3 Type 3 ships: no requirement.”

As such, paragraph 2.1.3 of Chapter 2 of Part II-A of the Polar Code means that carriage of NLS cargoes that would be permitted in a Type 3 ship (i.e. a ship which does not have cargo tank protection) are subject to approval by the administration.

Guidance for issuing an updated International Pollution Prevention Certificate for the Carriage of Noxious Liquid Substances in Bulk or Certificate of fitness is included in MEPC.1/Circ.856 – Guidance for Issuing Revised Certificates, Manual and Record Books under Annexes I, II and V of MARPOL for Compliance with the Environment-Related Requirements of the Polar Code.

CHAPTER 2 – CONTROL OF POLLUTION BY NOXIOUS LIQUID SUBSTANCES IN BULK

2.1 Operational requirements

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

2.1.2 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.

2.1.3 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 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.

Commentary

There are currently no additional requirements above those set out in MARPOL Annex III for the prevention of pollution by harmful substances carried by sea in packaged form in polar waters. Chapter 3 is a placeholder for any future requirements that are developed.

CHAPTER 3 – PREVENTION OF POLLUTION BY HARMFUL SUBSTANCES CARRIED BY SEA IN PACKAGED FORM

Kept blank intentionally.

Commentary

Paragraph 4.2.1

For existing Category A and B ships that operate in areas of ice concentrations less than 1/10 (note this is considered very unlikely, see commentary on 4.2.3 below) and new and existing Category C ships, the sewage discharge requirements are the same as in MARPOL Annex IV, Regulation 11, with the exception that the restrictions on discharge in Regulation 11 of Annex IV that are related to distances from the nearest land and modified by the Polar Code text of 4.2.1 to include distances from the nearest land, ice shelf or fast ice.

Paragraph 4.2.2

New Category A and B ships, as described in 4.2.2, are treated in the same way as existing MARPOL Annex IV requirements for passenger ships operating in special areas, i.e. discharge of sewage is prohibited unless through an approved sewage treatment plant as defined in MARPOL.

Paragraph 4.2.3

Existing Category A and B ships operating in ice concentrations more than 1/10 (which are considered to be the majority of existing Category A and B ships as they have relatively high ice class) as described in 4.2.3 are treated in the same way as existing MARPOL Annex IV requirements for passenger ships operating in special areas, i.e. discharge of sewage is prohibited unless through an approved sewage treatment plant as defined in MARPOL.

Note therefore that the majority of existing Category A and B ships must use a sewage treatment plant or retain sewage on board from 1 January 2017 when operating in polar waters.

CHAPTER 4 – PREVENTION OF POLLUTION BY SEWAGE FROM SHIPS

4.1 Definitions

- 4.1.1 Constructed means a ship the keel of which is laid or which is at a similar stage of construction.
- 4.1.2 Ice-shelf means a floating ice sheet of considerable thickness showing 2 to 50 m or more above sea-level, attached to the coast.
- 4.1.3 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.¹⁹

4.2 Operational requirements

- 4.2.1 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 plant²⁰ certified by the 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.
- 4.2.2 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 4.2.1.3 of this chapter.
- 4.2.3 Notwithstanding the requirements of paragraph 4.2.1, 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 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 Administration.

¹⁹ Refer to the WMO Sea-Ice Nomenclature.

²⁰ Refer to resolution MEPC.2(VI), resolution MEPC.159(55) or resolution MEPC.227(64) as applicable.

Commentary

Paragraph 5.2.1

The existing requirements in MARPOL Annex V include limitations on garbage discharge within special areas (Regulation 6). The Antarctic is already considered a special area under Annex V. The additional Polar Code requirements in 5.2 effectively make the Arctic a special area under MARPOL Annex V. The restrictions for discharge of garbage included in 5.2 align with those in Regulation 6 of MARPOL Annex V. The only modification that has been made is that the restrictions related to distances from land or ice shelf now also include land fast ice, and the general provision that discharges shall be as far as practicable from ice concentrations exceeding 1/10.

Paragraph 5.2.2

For the Antarctic area, 5.2.2 of the Code adds on to the existing special area requirement in Annex IV of MARPOL by prohibiting the discharge of food water onto ice. In addition, to be consistent with the approach taken to the Arctic, Regulation 6.1 is effectively modified so that the restrictions related to distances from land or ice shelf also include land fast ice, and the general provision that discharges shall be as far as practicable from ice concentrations exceeding 1/10.

Paragraph 5.2.3

Guidance for issuing updated garbage record books is included in MEPC.1/Circ.856 – Guidance for Issuing Revised Certificates, Manual and Record Books under Annexes I, II and V of MARPOL for Compliance with the Environment-Related Requirements of the Polar Code.

CHAPTER 5 – PREVENTION OF POLLUTION BY GARBAGE FROM SHIPS

5.1 Definitions

- 5.1.1 Ice-shelf means a floating ice sheet of considerable thickness showing 2 to 50 m or more above sea-level, attached to the coast.
- 5.1.2 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 icebergs²¹

5.2 Operational requirements

- 5.2.1 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 5.2.1.5.1, 5.2.1.5.2 and 5.2.1.5.3 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.
- 5.2.2 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.
- 5.2.3 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.

²¹ Refer to the WMO Sea-Ice Nomenclature.

ADDITIONAL GUIDANCE REGARDING THE PROVISIONS OF THE INTRODUCTION AND PART II-A

1 Additional guidance to Chapter 1

- 1.1 Ships are encouraged to apply regulation 43 of MARPOL Annex I when operating in Arctic waters.
- 1.2 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.

2 Additional guidance to Chapter 2

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.

3 Additional guidance to Chapter 5

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 (resolution MEPC.219(63), as amended by resolution MEPC.239(65)) and the 2012 Guidelines for the development of garbage management plans (resolution MEPC.220(63)).

4 Additional guidance under other environmental Conventions and guidelines

- 4.1 Until the International Convention for the Control and Management of Ships' Ballast Water and Sediments enters into force, 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 Convention should be considered as appropriate. The provisions of the Guidelines for ballast water exchange in the Antarctic treaty area (resolution MEPC.163(56)) should be taken into consideration along with other relevant guidelines developed by the Organization.
- 4.2 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.
- 4.3 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 (resolution MEPC.207(62)).

Table: Example of matters related to anti-fouling systems taken into consideration by some ice-going ships (This table is used by some operators of ice-going ships.)

	Hull	Sea chest
Year round operation in ice covered polar waters.	Abrasion resistant low friction ice coating. No anti-fouling system.	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.	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.	Compliant with the AFS Convention. Thickness of anti fouling system to be decided by shipowner.
Category B and C vessels.	Compliant with the AFS Convention. Thickness of anti fouling system to be decided by shipowner.	Compliant with the AFS Convention. Thickness of anti fouling system to be decided by shipowner.

APPENDIX 2 – Form of Certificate for Ships Operating in Polar Waters

POLAR SHIP CERTIFICATE

This Certificate shall be supplemented by a Record of Equipment for the Polar Ship Certificate

(Official seal)

(State)

Issued under the provisions of the

International Convention for the Safety of Life at Sea, 1974, as amended

under the authority of the Government of

(name of the State)

by _____
(person or organization authorized)

Particulars of ship²²

Name of ship.....
 Distinctive number or letters.....
 Port of registry.....
 Gross tonnage.....
 IMO Number²³

²² Alternatively, the particulars of the ship may be placed horizontally in boxes
²³ In accordance with IMO ship identification number scheme adopted by the Organization by resolution A.1078(28)

THIS IS TO CERTIFY:

- 1 That the ship has been surveyed in accordance with the applicable safety-related provisions of the International Code for Ships Operating in Polar Waters.
- 2 That the survey²⁴ showed that the structure, equipment, fittings, radio station arrangements, and materials of the ship and the condition thereof are in all respects satisfactory and that the ship complies with the relevant provisions of the Code.

Category A/B/C ship as follows:

Ice Class	Maximum draft		Minimum draft	
	Aft	Fwd	Aft	Fwd

- 2.1 Ship type: tanker/passenger ship/other⁴
- 2.2 Ship restricted to operate in ice free waters/open waters/other ice conditions⁴
- 2.3 Ship intended to operate in low air temperature: Yes/No⁴
- 2.3.1 Polar Service Temperature:°C/Not Applicable⁴
- 2.4 Maximum expected time of rescuedays
- 3 The ship was/was not⁴ subjected to an alternative design and arrangements in pursuance of regulation(s) XIV/4 of the International Convention for the Safety of Life at Sea, 1974, as amended.
- 4 A Document of approval of alternative design and arrangements for structure, machinery and electrical installations/fire protection/life-saving appliances and arrangements⁴ is/is not⁴ appended to Certificate.
- 5 Operational limitations
 The ship has been assigned the following limitations for operation in polar waters:
 - 5.1 Ice conditions:
 - 5.2 Temperature:
 - 5.3 High latitudes:

²⁴ Subject to regulation 1.3 of the International Code for Ships Operating in Polar Waters
²⁵ Delete as appropriate

This certificate is valid until subject to the annual/periodical/intermediate surveys in accordance with section 1.3 of the Code²⁶

Completion date of the survey on which this certificate is based:
(dd/mm/yyyy)

Issued at
(Place of issue of certificate)

.....
(Date of issue)
issuing the certificate)

.....
(Signature of authorized official

(Seal or stamp of the issuing authority, as appropriate)

²⁶ Delete as appropriate

Endorsement for annual, periodical and intermediate surveys⁶

THIS IS TO CERTIFY that, at a survey required by regulation 1.3 of the Code, the ship was found to comply with the relevant requirements of the Code.

Annual survey:

Signed:
(Signature of authorized official)

Place:

Date:
(Seal or stamp of the authority, as appropriate)

Annual/Periodical/Intermediate²⁷ survey:

Signed:
(Signature of authorized official)

Place:

Date:
(Seal or stamp of the authority, as appropriate)

Annual/Periodical/Intermediate⁶ survey:

Signed:
(Signature of authorized official)

Place:

Date:
(Seal or stamp of the authority, as appropriate)

Annual/Periodical/Intermediate⁶ survey:

Signed:
(Signature of authorized official)

Place:

Date:
(Seal or stamp of the authority, as appropriate)

²⁷ Delete as appropriate

Endorsement to extend the certificate if valid for less than 5 years where regulation I/14(c) of the Convention applies²⁸

The ship complies with the relevant requirements of the Convention, and this certificate shall, in accordance with regulation I/14(c) of the Convention, be accepted as valid until.....

Signed:
(Signature of authorized official)

Place:

Date:
(Seal or stamp of the authority, as appropriate)

Endorsement where the renewal survey has been completed and regulation I/14(d) of the Convention applies⁷

The ship complies with the relevant requirements of the Convention, and this certificate shall, in accordance with regulation I/14(d) of the Convention, be accepted as valid until.....

Signed:
(Signature of authorized official)

Place:

Date:
(Seal or stamp of the authority, as appropriate)

Endorsement to extend the validity of the certificate until reaching the port of survey or for a period of grace where regulation I/14(e) or I/14(f) of the Convention applies⁷

This certificate shall, in accordance with regulation I/14(e)/I/14(f) of the Convention, be accepted as valid until.....

Signed:
(Signature of authorized official)

Place:

Date:
(Seal or stamp of the authority, as appropriate)

²⁸ Delete as appropriate

Endorsement for advancement of anniversary date where regulation I/14(h) of the Convention applies²⁹

In accordance with regulation I/14(h) of the Convention, the new anniversary date is

Signed:
(Signature of authorized official)

Place:

Date:
(Seal or stamp of the authority, as appropriate)

In accordance with regulation I/14(h) of the Convention, the new anniversary date is

Signed:
(Signature of authorized official)

Place:

Date:
(Seal or stamp of the authority, as appropriate)

²⁹ Delete as appropriate

Record of Equipment for the Polar Ship Certificate

This record shall be permanently attached to the Polar Ships Certificate

RECORD OF EQUIPMENT FOR COMPLIANCE WITH THE INTERNATIONAL CODE FOR SHIPS OPERATING IN POLAR WATERS

1 Particulars of ship:

Name of ship:
 Distinctive number or letters:

2 Record of equipment

2.1 Life-saving appliances

1 Total number of immersion suits with insulation:	.....
1.1 for crew	.....
1.2 for passengers	.....
2 Total number of thermal protective aids	.....
3 Personal and Group Survival Equipment	.....
3.1 Personal survival equipment – for number of persons	.....
3.2 Group survival equipment – for number persons	.....
3.3 Total capacity of liferafts in compliance with chapter 8 of the Polar Code	.....
3.4 Total capacity of lifeboats in compliance with chapter 8 of the Polar Code	.....

2.2 Navigation equipment

1 Two independent echo-sounding devices or a device with two separate independent transducers	.....
2 Remotely rotatable, narrow-beam search lights controllable from the bridge or other means to visually detect ice	.....
3 Manually initiated flashing red light visible from astern (for ships involved in icebreaking operations)	.....
4 Two or more non-magnetic independent means to determine and display heading	.....
5 GNSS compass or equivalent (for ships proceeding to latitudes over 80 degrees)	.....

2.3 Communication equipment

1 Sound signaling system mounted to face astern to indicate escort and emergency manoeuvres to following ships as described in the International Code of Signals (for ships intended to provide ice breaking escort).	.....
2 Voice and/or data communications with relevant rescue coordination centres.	.....
3 Equipment for voice communications with aircraft on 121.5 and 123.1 MHz.	.....
4 Two-way voice and data communication with a Telemedical Assistance Service (TMAS).	.....
5 All rescue boats and lifeboats, whenever released for evacuation, have a device (for ships certified to operate in low air temperature):	
5.1 for transmitting vessel to shore alerts;	.....
5.2 for transmitting signals for location;	.....
5.3 for transmitting and receiving on scene communications.	.....
6 All other survival craft have a device:	
6.1 for transmitting signals for location; and	.....
6.2 for transmitting and receiving on scene communications.	.....

THIS IS TO CERTIFY that this Record is correct in all respects

Issued at.....
 (Place of issue of the Record)

.....
 (Date of issue)

.....
 (Signature of duly authorized official issuing the Record)

(Seal or stamp of the issuing authority, as appropriate)

APPENDIX 2 – Model Table of Contents for the Polar Water Operational Manual (PWOM)

SAFETY MEASURES

Division 1 – Operational capabilities and limitations

Chapter 1 – Operation in ice

1.1 Operator guidance for safe operation

Guidance: The PWOM should establish the means by which decisions as to whether ice conditions exceed the ship's design limits should be made, taking into account the Operational Limitations on the PSC. 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, can be used... Bridge personnel should be trained in the proper use of the system to be utilized. For ships that will operate only in ice-free waters, procedures to ensure that will keep the ship from encountering ice should be established.

1.2 Icebreaking capabilities

Guidance: The PWOM should provide information on the ice conditions in which the ship can be expected to make continuous progress. This may be drawn, for example from numerical analysis, model test or from ice trials. Information on the influence of ice strength for new or decayed ice and of snow cover may be included.

1.3 Manoeuvring in ice

1.4 Special features

Guidance: Where applicable, the PWOM should include the results of any equivalency analyses made to determine Polar Ship Category/ice class. The manual should also provide information on the use of any specialized systems fitted to assist in ice operations.

Chapter 2 – Operation in low air temperatures

2.1 System design

Guidance: The PWOM should list all ship systems susceptible to damage or loss of functionality by exposure to low temperatures, and the measures to be adopted to avoid malfunction.

Chapter 3 – Communication and navigation capabilities in high latitudes

Guidance: The PWOM should identify any restrictions to operational effectiveness of communications and navigational equipment that may result from operating in high latitudes.

Chapter 4 – Voyage duration

Guidance: The PWOM should provide information on any limitations on ship endurance such as fuel tankage, fresh water capacity, provision stores, etc. This will normally only be a significant consideration for smaller ships, or for ships planning to spend extended periods in ice.

Division 2 – Ship operations

Chapter 1 – Strategic planning

Assumptions used in conducting the analyses referred to below should be included in the Manual.

1.1 Avoidance of hazardous ice

Guidance: For ships operating frequently in polar waters, the PWOM should provide information with respect to periods during which the ship should be able to operate for intended areas of operation. Areas that pose particular problems, e.g. chokepoints, ridging, as well as worst recorded ice conditions should be noted. Where the available information is limited or of uncertain quality, this should be recognized and noted as a risk for voyage planning.

1.2 Avoidance of hazardous temperatures

Guidance: For ships operating frequently in polar waters, the PWOM should provide information with respect to, the daily mean daily low temperature as well as the minimum recorded temperature for each of the days during the intended operating period. Where the available information is limited or of uncertain quality, this should be recognized as a risk for voyage planning.

1.3 Voyage duration and endurance

Guidance: Procedures to establish requirements for supplies should be established, and appropriate safety levels for safety margins determined taking into account various scenarios, e.g. slower than expected steaming, course alterations, adverse ice conditions, places of refuge and access to provisions. Sources for and availability of fuel types should be established, taking into account long lead times required for deliveries.

1.4 Human resources management

Guidance: The PWOM should provide guidance for the human resources management, taking into account the anticipated ice conditions and requirements for ice navigation, increased levels of watch keeping, hours of rest, fatigue and a process that ensures that these requirements will be met.

Chapter 2 – Arrangements for receiving forecasts of environmental conditions

Guidance: The PWOM should set out the means and frequency for provision of ice and weather information. Where a ship is intended to operate in or in the presence of ice, the manual should set out when weather and ice information is required and the format for the information.

When available, the information should include both global and localized forecasts that will identify weather and ice patterns/regimes that could expose the ship to adverse conditions.

The frequency of updates should provide enough advance notice that the ship can take refuge or use other methods of avoiding the hazard if the conditions are forecast to exceed its capabilities.

The PWOM may include use of a land-based support information provider an effective method of sorting through available information, thereby providing the ship only with information that is relevant, reducing demands on the ship's communications systems. The manual may also indicate instances in which additional images should be obtained and analysed, as well as where such additional information may be obtained.

2.1 Ice information

Guidance: The PWOM should include or refer to guidance on how radar should be used to identify ice floes, how to tune the radar to be most effective, instructions on how to interpret radar images, etc. If other technologies are to be used to provide ice information, their use should also be described.

2.2 Meteorological information

Chapter 3 – Verification of hydrographic, meteorological and navigational information

Guidance: The PWOM should provide guidance on the use of hydrographic information as further described in the additional guidance to chapter 10.

Chapter 4 – Operation of Special Equipment

4.1 Navigation systems

4.2 Communications systems

Chapter 5 – Procedures to maintain equipment and system functionality

5.1 Icing prevention and de-icing

Guidance: The PWOM should provide guidance on how to prevent or mitigate icing by operational means, how to monitor and assess ice accretion, how to conduct de-icing using equipment available on the ship, and how to maintain the safety of the ship and its crew during all of these aspects of the operation.

5.2 Operation of seawater systems

Guidance: The PWOM should provide guidance on how to monitor, prevent or mitigate ice ingestion by seawater systems when operating in ice or in low water temperatures. This may include recirculation, use of low rather than high suction, etc.

5.3 Procedures for low temperature operations

Guidance: The PWOM should provide guidance on maintaining and monitoring any systems and equipment that are required to be kept active in order to ensure functionality; e.g. by trace heating or continuous working fluid circulation.

Division 3 – Risk management

Chapter 1 – Risk mitigation in limiting environmental condition

1.1 Measures to be considered in adverse ice conditions

Guidance: The PWOM should contain guidance for the use of low speeds in the presence of hazardous ice. Procedures should also be set for enhanced watchkeeping and lookout manning in situations with high risks from ice, e.g. in proximity to icebergs, operation at night, and other situations of low visibility. When possibilities for contact with hazardous ice exist, procedures should address regular monitoring, e.g. soundings/inspections of compartments and tanks below the waterline.

1.2 Measures to be considered in adverse temperature conditions

Guidance: The PWOM should contain guidance on operational restrictions in the event that temperatures below the ship's polar service temperature are encountered or forecast. These may include delaying the ship, postponing the conduct of certain types of operation, using temporary heating, and other risk mitigation measures.

Chapter 2 – Emergency response

Guidance: In general, where the possibility of encountering low air temperatures, sea ice, and other hazards is present, the PWOM should provide guidance on procedures that will increase the effectiveness of emergency response measures.

2.1 Damage control

Guidance: the PWOM should consider damage control measures arrangements for emergency transfer of liquids and access to tanks and spaces during salvage operations.

2.2 Firefighting

2.3 Escape and evacuation

Guidance: Where supplementary or specialized lifesaving equipment is carried to address the possibilities of prolonged durations prior to rescue, abandonment onto ice or adjacent land, or other aspects specific to polar operations, the PWOM should contain guidance on the use of the equipment and provision for appropriate training and drills.

Chapter 3 – Coordination with emergency response services

3.1 Ship emergency response

Guidance: The PWOM should include procedures to be followed in preparing for a voyage and in the event of an incident arising.

3.2 Salvage

Guidance: The PWOM should include procedures to be followed in preparing for a voyage and in the event of an incident arising.

3.3 Search and rescue

Guidance: The PWOM should contain information on identifying relevant Rescue Coordination Centres for any intended routes, and should require that contact information and procedures be verified and updated as required as part of any voyage plan.

Chapter 4 – Procedures for maintaining life support and ship integrity in the event of prolonged entrapment by ice.

Guidance: Where any ship incorporates special features to mitigate safety or environmental risks due to prolonged entrapment by ice, the PWOM should provide information on how these are to be set up and operated. This may include, for example, adding additional equipment to be run from emergency switchboards, draining systems at risk of damage through freezing, isolating parts of HVAC systems, etc.

4.1 System configuration

4.2 System operation

Division 4 – Joint operations

Chapter 1 – Escorted operations

Guidance: The PWOM should contain or reference information on the rules and procedures set out by coastal States who require or offer icebreaking escort services. The manual should also emphasize the need for the master to take account of the ship's limitations in agreeing on the conduct of escort operations.

Chapter 2 – Convoy operations

APPENDIX 3 – RESOLUTION MSC.386(94)

(Adopted on 21 November 2014)

AMENDMENTS TO THE INTERNATIONAL CONVENTION FOR THE SAFETY OF LIFE AT SEA, 1974, AS AMENDED

THE MARITIME SAFETY COMMITTEE,

RECALLING Article 28(b) of the Convention on the International Maritime Organization concerning the functions of the Committee,

RECALLING ALSO article VIII(b) of the International Convention for the Safety of Life at Sea (SOLAS), 1974 ("the Convention"), concerning the amendment procedure applicable to the annex to the Convention, other than to the provisions of chapter I,

RECOGNIZING the need to provide a mandatory framework for ships operating in polar waters due to the additional demands on ships, their systems and operation, which go beyond the existing requirements of the Convention, and other relevant binding IMO instruments,

NOTING resolution MSC.385(94), by which the Committee adopted the International Code for Ships Operating in Polar Waters (Polar Code) with respect to its provisions for safety,

NOTING ALSO that the Marine Environment Protection Committee, at its sixty-seventh session, approved with a view to adoption, at its sixty-eighth session, amendments to the International Convention for the Prevention of Pollution from Ships, 1973, as modified by the Protocol of 1978, and that it will also consider for adoption the environmental protection provisions of the Polar Code,

NOTING FURTHER the proposed amendments to the Convention to make use of the safety provisions of the Polar Code mandatory,

HAVING CONSIDERED, at its ninety-fourth session, amendments to the Convention, proposed and circulated in accordance with article VIII(b)(i) thereof,

- 1 ADOPTS, in accordance with article VIII(b)(iv) of the Convention, amendments to the Convention, the text of which is set out in the annex to the present resolution;
- 2 DETERMINES, in accordance with article VIII(b)(vi)(2)(bb) of the Convention, that the said amendments shall be deemed to have been accepted on 1 July 2016, unless, prior to that date, more than one third of the Contracting Governments to the Convention or Contracting Governments the combined merchant fleets of which constitute not less than 50% of the gross tonnage of the world's merchant fleet, have notified to the Secretary-General of the Organization their objections to the amendments;
- 3 INVITES SOLAS Contracting Governments to note that, in accordance with article VIII(b)(vii)(2) of the Convention, the amendments shall enter into force on 1 January 2017 upon their acceptance in accordance with paragraph 2 above;
- 4 REQUESTS the Secretary-General, for the purposes of article VIII(b)(v) of the Convention, to transmit certified copies of the present resolution and the text of the amendments contained in the annex to all Contracting Governments to the Convention;
- 5 ALSO REQUESTS the Secretary-General to transmit copies of this resolution and its annex to Members of the Organization which are not Contracting Governments to the Convention.

ANNEX

AMENDMENTS TO THE INTERNATIONAL CONVENTION FOR THE SAFETY OF LIFE AT SEA, 1974, AS AMENDED

A new chapter XIV is added after chapter XIII, as follows:

“CHAPTER XIV SAFETY MEASURES FOR SHIPS OPERATING IN POLAR WATERS**Regulation 1 – Definitions**

For the purpose of this chapter:

1 *Polar Code* means the International Code for Ships Operating in Polar Waters, consisting of an introduction and parts I-A and II-A and parts I-B and II-B, as adopted by resolutions MSC.385(94) and of the Marine Environment Protection Committee*, as may be amended, provided that:

- .1 amendments to the safety-related provisions of the introduction and part I-A of the Polar Code are adopted, brought into force and take effect in accordance with the provisions of article VIII of the present Convention concerning the amendment procedures applicable to the annex other than chapter I; and
- .2 amendments to part I-B of the Polar Code are adopted by the Maritime Safety Committee in accordance with its Rules of Procedure.

* Refer to the resolution of adoption of the International Code for Ships Operating in Polar Waters, by the Marine Environment Protection Committee.

2 *Antarctic area* means the sea area south of latitude 60° S.

3 *Arctic waters* means 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 (Cap 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.

4 *Polar waters* means Arctic waters and/or the Antarctic area.

5 *Ship constructed* means a ship the keel of which is laid or which is at a similar stage of construction.

6 At a similar stage of construction means the stage at which:

- .1 construction identifiable with a specific ship begins; and
- .2 assembly of that ship has commenced comprising at least 50 tonnes or 1% of the estimated mass of all structural material, whichever is less.

Regulation 2 – Application

- 1 Unless expressly provided otherwise, this chapter applies to ships operating in polar waters, certified in accordance with chapter I.
- 2 Ships constructed before 1 January 2017 shall meet the relevant requirements of the Polar Code by the first intermediate or renewal survey, whichever occurs first, after 1 January 2018.
- 3 In applying part I-A of the Polar Code, consideration should be given to the additional guidance in part I-B of the Polar Code.
- 4 This chapter shall not apply to ships owned or operated by a Contracting Government and used, for the time being, only in Government non-commercial service. However, ships owned or operated by a Contracting Government and used, for the time being, only in Government non-commercial service are encouraged to act in a manner consistent, so far as reasonable and practicable, with this chapter.
- 5 Nothing in this chapter shall prejudice the rights or obligations of States under international law.

Regulation 3 – Requirements for ships to which this chapter applies

- 1 Ships to which this chapter applies shall comply with the requirements of the safety-related provision of the introduction and with part I-A of the Polar Code and shall, in addition to the requirements of regulations I/7, I/8, I/9, and I/10, as applicable, be surveyed and certified, as provided for in that Code.
- 2 Ships to which this chapter applies holding a certificate issued pursuant to the provisions of paragraph 1 shall be subject to the control established in regulations I/19 and XI-1/4. For this purpose, such certificates shall be treated as a certificate issued under regulation I/12 or I/13.

Regulation 4 – Alternative design and arrangement

- 1 The goal of this regulation is to provide a methodology for alternative design and arrangements for structure, machinery, and electrical installations, fire safety and life-saving appliances and arrangements.
- 2 Structural arrangements, machinery and electrical installation, fire safety design and arrangement measures and as well as life-saving appliances and arrangements may deviate from the prescriptive requirements set out in chapters 3, 6, 7 and 8 of the Polar Code, provided that the alternative design and arrangements meet the intent of the goal and functional requirements concerned and provide an equivalent level of safety to the requirements in those chapters.
- 3 When alternative designs or arrangements deviate from the prescriptive requirements of chapters 3, 6, 7 and 8 of the Polar Code, an engineering analysis, evaluation and approval of the design and arrangements shall be carried out based on the guidelines approved by the Organization¹.
- 4 Any alternative designs or arrangement deviating from the prescriptive requirements shall be recorded in the Polar Ship Certificate and the ship's Polar Water Operational Manual, as required by the Polar Code, also defining the technical and operational measures and conditions for the allowed deviation.

¹ Refer to the Guidelines for the approval of alternatives and equivalents as provided for in various IMO instruments (MSC.1/Circ.1455), the Guidelines on alternative design and arrangements for SOLAS chapters II-1 and III (MSC.1/Circ.1212) and the Guidelines on alternative design and arrangements for fire safety (MSC/Circ.1002), as applicable.”

APPENDIX 4 – RESOLUTION MEPC.265(68)

ANNEX 11

RESOLUTION MEPC.265(68)

(adopted on 15 May 2015)

AMENDMENTS TO THE ANNEX OF THE PROTOCOL OF 1978 RELATING TO THE INTERNATIONAL CONVENTION FOR THE PREVENTION OF POLLUTION FROM SHIPS, 1973

Amendments to MARPOL Annexes I, II, IV and V (Making the use of the environment-related provisions of the Polar Code mandatory)

THE MARINE ENVIRONMENT PROTECTION COMMITTEE,

RECALLING Article 38(a) of the Convention on the International Maritime Organization concerning the functions of the Marine Environment Protection Committee conferred upon it by international conventions for the prevention and control of marine pollution from ships,

NOTING article 16 of the International Convention for the Prevention of Pollution from Ships, 1973, as modified by the Protocol of 1978 relating thereto (MARPOL), which specifies the amendment procedure and confers upon the appropriate body of the Organization the function of considering and adopting amendments thereto,

RECOGNIZING the need to provide a mandatory framework for ships operating in polar waters due to the additional demands on ships, their systems and operation, which go beyond the existing requirements of MARPOL, and other relevant binding IMO instruments,

NOTING resolution MEPC.264(68), by which it adopted the International Code for Ships Operating in Polar Waters (Polar Code) with respect to its environment-related provisions,

NOTING ALSO that the Maritime Safety Committee, at its ninety-fourth session, adopted, by resolution MSC.385(94), the International Code for Ships Operating in Polar Waters with respect to its safety-related provisions, and, by resolution MSC.386(94), amendments to the 1974 SOLAS Convention to make the safety-related provisions of the Polar Code mandatory,

HAVING CONSIDERED proposed amendments to MARPOL Annexes I, II, IV and V to make the environment-related provisions of the Polar Code mandatory,

- 1 ADOPTS, in accordance with article 16(2)(d) of MARPOL, amendments to Annexes I, II, IV and V, the text of which is set out in the annex to the present resolution;
- 2 DETERMINES, in accordance with article 16(2)(f)(iii) of MARPOL, that the amendments shall be deemed to have been accepted on 1 July 2016, unless, prior to that date, not less than one third of the Parties or Parties the combined merchant fleets of which constitute not less than 50% of the gross tonnage of the world's merchant fleet, have communicated to the Organization their objection to the amendments;
- 3 INVITES the Parties to note that, in accordance with article 16(2)(g)(ii) of MARPOL, the said amendments shall enter into force on 1 January 2017 upon their acceptance in accordance with paragraph 2 above;
- 4 REQUESTS the Secretary-General, for the purposes of article 16(2)(e) of MARPOL, to transmit certified copies of the present resolution and the text of the amendments contained in the annex to all Parties to MARPOL;
- 5 REQUESTS FURTHER the Secretary-General to transmit copies of the present resolution and its annex to Members of the Organization which are not Parties to MARPOL.

ANNEX

AMENDMENTS TO MARPOL ANNEXES I, II, IV AND V

ANNEX I

REGULATIONS FOR THE PREVENTION OF POLLUTION BY OIL

Chapter 1 General

Regulation 3 – Exemptions and waivers

- 1 In paragraph 1, the words “or section 1.2 of part II-A of the Polar Code” are inserted between “chapters 3 and 4 of this Annex” and “relating to construction”.
- 2 A new paragraph 5.2.2 is added as follows:
 - “.2 voyages within Arctic waters; or”
- 3 The existing paragraphs 5.2.2 to 5.2.6 are renumbered as paragraphs 5.2.3 to 5.2.7 and the subparagraphs are renumbered accordingly. In the renumbered paragraphs 5.2.5 and 5.2.6, the referenced paragraph numbers “5.2.2” and “5.2.2.2” are replaced by “5.2.3” and “5.2.3.2”, respectively.
- 4 The chapeau of the renumbered paragraph 5.2.3 is replaced with the following:
 - “.3 voyages within 50 nautical miles from the nearest land outside special areas or Arctic waters where the tanker is engaged in:”

Regulation 4 – Exceptions

- 5 The chapeau is replaced with the following:

“Regulations 15 and 34 of this Annex and paragraph 1.1.1 of part II-A of the Polar Code shall not apply to:”

Chapter 3 Requirements for machinery spaces of all ships

Part B Equipment

Regulation 14 – Oil filtering equipment

- 6 Paragraph 5.1 is replaced with the following:
 - “.1 any ship engaged exclusively on voyages within special areas or Arctic waters, or”
- 7 In paragraph 5.3.4, between the words “within special areas” and “or has been accepted”, the words “or Arctic waters” are inserted.

Part C
Control of discharge of oil

Regulation 15 – Control of discharge of oil

- 8 At the end of the title for section A, the words “except in Arctic waters” are added.
- 9 At the end of the title for section C, the words “and Arctic waters” are added.

Chapter 4
Requirements for the cargo area of oil tankers

Part C
Control of operational discharges of oil

Regulation 34 – Control of discharge of oil

- 10 At the end of the title for section A, the words “except in Arctic waters” are added.

Chapter 6
Reception facilities

Regulation 38 – Reception facilities

- 11 In paragraph 2.5, the words “and paragraph 1.1.1 of part II-A of the Polar Code” are added after the words “regulations 15 and 34 of this Annex”.
- 12 In paragraph 3.5, the words “and paragraph 1.1.1 of part II-A of the Polar Code” are added after the words “regulation 15 of this Annex”.

Chapter 11
International Code for Ships Operating in Polar Waters

- 13 A new chapter 11 is added after existing chapter 10 as follows:

“Chapter 11 – International Code for Ships Operating in Polar Waters

Regulation 46 – Definitions

For the purpose of this Annex,

- 1 *Polar Code* means the International Code for Ships Operating in Polar Waters, consisting of an introduction, parts I-A and II-A and parts I-B and II-B, adopted by resolutions MSC.385(94) and MEPC.264(68), as may be amended, provided that:
- .1 amendments to the environment-related provisions of the introduction and chapter 1 of part II-A of the Polar Code are adopted, brought into force and take effect in accordance with the provisions of article 16 of the present Convention concerning the amendment procedures applicable to an appendix to an annex; and
 - .2 amendments to part II-B of the Polar Code are adopted by the Marine Environment Protection Committee in accordance with its Rules of Procedure.

- 2 *Arctic waters* means 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 (Cap 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'pyskiy 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.
- 3 *Polar waters* means Arctic waters and/or the Antarctic area.

Regulation 47 – Application and requirements

- 1 This chapter applies to all ships operating in polar waters.
- 2 Unless expressly provided otherwise, any ship covered by paragraph 1 of this regulation shall comply with the environment-related provisions of the introduction and with chapter 1 of part II-A of the Polar Code, in addition to any other applicable requirements of this Annex.
- 3 In applying chapter 1 of part II-A of the Polar Code, consideration should be given to the additional guidance in part II-B of the Polar Code.”

Appendix II
Form of IOPP Certificate and Supplements

Appendix

Supplement to the international Oil Pollution Prevention Certificate (IOPP Certificate) – Form A

- 14 A new section 8 is added after existing section 7 as follows:
- “8 Compliance with part II-A – chapter 1 of the Polar Code
- 8.1 The ship is in compliance with additional requirements in the environment-related provisions of the Introduction and section 1.2 of chapter 1 of part II-A of the Polar Code.....”

Supplement to the international Oil Pollution Prevention Certificate (IOPP Certificate) – Form B

- 15 A new section 11 is added after existing section 10 as follows:
- “11 Compliance with part II-A – chapter 1 of the Polar Code
- 11.1 The ship is in compliance with additional requirements in the environment-related provisions of the introduction and section 1.2 of chapter I of part II-A of the Polar Code.”

ANNEX II
REGULATIONS FOR THE CONTROL OF POLLUTION OF NOXIOUS LIQUID SUBSTANCES IN BULK

Chapter 1
General

Regulation 3 – Exceptions

- 1 In the chapeau of paragraph 1, between the words “this Annex” and “shall not apply”, the words “and chapter 2 of part II-A of the Polar Code” are inserted.

Chapter 6
Measures of control by port States

Regulation 16 – Measures of control

- 2 In paragraph 3, the reference to “regulation 13 and of this regulation” is replaced with “regulation 13 and of this regulation, and chapter 2 of part II-A of the Polar Code when the ship is operating in Arctic waters,”

Chapter 10
International Code for Ships Operating in Polar Waters

- 3 A new chapter 10 is added after existing chapter 9 as follows:

“Chapter 10 – International Code for International Code for Ships Operating in Polar Waters

Regulation 21 – Definitions

For the purpose of this Annex,

- 1 *Polar Code* means the International Code for Ships Operating in Polar Waters, consisting of an introduction, part I-A and part II-A and parts I-B and II-B, as adopted by resolutions MSC.385(94) and MEPC.264(68), as may be amended, provided that:

- .1 amendments to the environment-related provisions of the introduction and chapter 2 of part II-A of the Polar Code are adopted, brought into force and take effect in accordance with the provisions of article 16 of the present Convention concerning the amendment procedures applicable to an appendix to an annex; and
- .2 amendments to part II-B of the Polar Code are adopted by the Marine Environment Protection Committee in accordance with its Rules of Procedure.

- 2 *Arctic waters* means 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 (Cap 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'pyskiy 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.

- 3 *Polar waters* means Arctic waters and/or the Antarctic area.

Regulation 22 – Application and requirements

- 1 This chapter applies to all ships certified to carry noxious liquid substances in bulk, operating in polar waters.
- 2 Unless expressly provided otherwise, any ship covered by paragraph 1 of this regulation shall comply with the environment-related provisions of the introduction and with chapter 2 of part II-A of the Polar Code, in addition to any other applicable requirements of this Annex.
- 3 In applying chapter 2 of part II-A of the Polar Code, consideration should be given to the additional guidance in part II-B of the Polar Code.”

Appendix IV
Standard format for the Procedures and Arrangements Manual

Section 1 – Main features of MARPOL Annex II

- 4 At the end of paragraph 1.3, the following sentence is added:

“In addition, under chapter 2 of part II-A of the Polar Code, more stringent discharge criteria apply in Arctic waters.”

Section 4 – Procedures relating to the cleaning of cargo tanks, the discharge of residues, ballasting and deballasting

- 5 In paragraph 4.4.3, the words “Antarctic area (the sea area south of latitude 60° S)” are replaced with the words “polar waters”.

ANNEX IV
REGULATIONS FOR THE PREVENTION OF POLLUTION BY SEWAGE FROM SHIPS

Chapter 1
General

Regulation 3 – Exceptions

- 1 The chapeau of paragraph 1 is replaced with the following:

“1 Regulation 11 of this Annex and section 4.2 of chapter 4 of part II-A of the Polar Code, shall not apply to:”

Chapter 7
International Code for Ships Operating in Polar Waters

- 2 A new chapter 7 is added after existing chapter 6 as follows:

“Chapter 7 – International Code for Ships Operating in Polar Waters

Regulation 17 – Definitions

For the purpose of this Annex,

1 *Polar Code* means the International Code for ships operating in polar waters, consisting of an introduction, part I-A and part II-A and parts I-B and II-B, as adopted by resolutions MSC.385(94) and MEPC.264(68), as may be amended, provided that:

- .1 amendments to the environment-related provisions of the introduction and chapter 4 of part II-A of the Polar Code are adopted, brought into force and take effect in accordance with the provisions of article 16 of the present Convention concerning the amendment procedures applicable to an appendix to an annex; and
- .2 amendments to part II-B of the Polar Code are adopted by the Marine Environment Protection Committee in accordance with its Rules of Procedure.

2 *Antarctic area* means the sea area south of latitude 60° S.

3 *Arctic waters* means 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°3'.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 (Cap 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.

4 *Polar waters* means Arctic waters and/or the Antarctic area.

Regulation 18 – Application and requirements

- 1 This chapter applies to all ships certified in accordance with this Annex operating in polar waters.
- 2 Unless expressly provided otherwise, any ship covered by paragraph 1 of this regulation shall comply with the environment-related provisions of the introduction and with chapter 4 of part II-A of the Polar Code, in addition to any other applicable requirements of this Annex."

ANNEX V REGULATIONS FOR THE PREVENTION OF POLLUTION BY GARBAGE FROM SHIPS

Chapter 1 General

Regulation 3 – General prohibition on discharge of garbage into the sea

- 1 In paragraph 1, the reference to "regulation 4, 5, 6 and 7 of this Annex" is replaced with "regulation 4, 5, 6 and 7 of this Annex and section 5.2 of part II-A of the Polar Code, as defined in regulation 13.1 of this Annex."

Regulation 7 – Exceptions

- 2 The chapeau of paragraph 1 is replaced with the following:

"1 Regulations 3, 4, 5 and 6 of this Annex and section 5.2 of chapter 5 of part II-A of the Polar Code shall not apply to:"

3 Paragraph 2.1 is replaced with the following:

".1 The en route requirements of regulations 4 and 6 of this Annex and chapter 5 of part II-A of the Polar Code shall not apply to the discharge of food wastes where it is clear the retention on board of these food wastes presents an imminent health risk to the people on board."

Regulation 10 – Placards, garbage management plans and garbage record keeping

- 4 In paragraph 1.1, the words "and section 5.2 of part II-A of the Polar Code" are added after the references to "regulations 3, 4, 5 and 6 of this Annex".

Chapter 3 International Code for Ships Operating in Polar Waters

5 A new chapter 3 is added as follows:

"Chapter 3 – International Code for Ships Operating in Polar Waters Regulation 13 – Definitions

For the purpose of this Annex,

1 *Polar Code* means the International Code for Ships Operating in Polar Waters, consisting of an introduction, part I-A and part II-A and parts I-B and II-B, as adopted by resolutions MSC.385(94) and MEPC.264(68), as may be amended, provided that:

- .1 amendments to the environment-related provisions of the introduction and chapter 5 of part II-A of the Polar Code are adopted, brought into force and take effect in accordance with the provisions of article 16 of the present Convention concerning the amendment procedures applicable to an appendix to an annex; and
- .2 amendments to part II-B of the Polar Code are adopted by the Marine Environment Protection Committee in accordance with its Rules of Procedure.

2 *Arctic waters* means 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°3'.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 (Cap 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.

3 *Polar waters* means Arctic waters and/or the Antarctic area.

Regulation 14 – Application and requirements

- 1 This chapter applies to all ships to which this Annex applies, operating in polar waters.
- 2 Unless expressly provided otherwise, any ship covered by paragraph 1 of this regulation shall comply with the environment-related provisions of the introduction and with chapter 5 of part II-A of the Polar Code, in addition to any other applicable requirements of this Annex.
- 3 In applying chapter 5 of part II-A of the Polar Code, consideration should be given to the additional guidance in part II-B of the Polar Code.”

Appendix Form of Garbage Record Book

- 6 The chapeau of section 4.1.3 is replaced with the following:

“4.1.3 When garbage is discharged into the sea in accordance with regulations 4, 5 or 6 of MARPOL Annex V or chapter 5 of part II-A of the Polar Code:”

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September 2016

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