



**BUREAU
VERITAS**

Guidelines for Existing Ships Operating in Polar Waters

May 2018

**Guidance Note
NI 650 DT R00 E**

Marine & Offshore

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BUREAU
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MARINE & OFFSHORE - GENERAL CONDITIONS

1. INDEPENDENCY OF THE SOCIETY AND APPLICABLE TERMS

1.1. The Society shall remain at all times an independent contractor and neither the Society nor any of its officers, employees, servants, agents or subcontractors shall be or act as an employee, servant or agent of any other party hereto in the performance of the Services.

1.2. The operations of the Society in providing its Services are exclusively conducted by way of random inspections and do not, in any circumstances, involve monitoring or exhaustive verification.

1.3. The Society acts as a services provider. This cannot be construed as an obligation bearing on the Society to obtain a result or as a warranty. The Society is not and may not be considered as an underwriter, broker in Unit's sale or chartering, expert in Unit's valuation, consulting engineer, controller, naval architect, manufacturer, shipbuilder, repair or conversion yard, charterer or shipowner; none of them above listed being relieved of any of their expressed or implied obligations as a result of the interventions of the Society.

1.4. The Services are carried out by the Society according to the applicable Rules and to the Bureau Veritas' Code of Ethics. The Society only is qualified to apply and interpret its Rules.

1.5. The Client acknowledges the latest versions of the Conditions and of the applicable Rules applying to the Services' performance.

1.6. Unless an express written agreement is made between the Parties on the applicable Rules, the applicable Rules shall be the rules applicable at the time of the Services' performance and contract's execution.

1.7. The Services' performance is solely based on the Conditions. No other terms shall apply whether express or implied.

2. DEFINITIONS

2.1. **"Certificate(s)"** means class certificates, attestations and reports following the Society's intervention. The Certificates are an appraisement given by the Society to the Client, at a certain date, following surveys by its surveyors on the level of compliance of the Unit to the Society's Rules or to the documents of reference for the Services provided. They cannot be construed as an implied or express warranty of safety, fitness for the purpose, seaworthiness of the Unit or of its value for sale, insurance or chartering.

2.2. **"Certification"** means the activity of certification in application of national and international regulations or standards, in particular by delegation from different governments that can result in the issuance of a certificate.

2.3. **"Classification"** means the classification of a Unit that can result or not in the issuance of a class certificate with reference to the Rules.

2.4. **"Client"** means the Party and/or its representative requesting the Services.

2.5. **"Conditions"** means the terms and conditions set out in the present document.

2.6. **"Industry Practice"** means International Maritime and/or Offshore industry practices.

2.7. **"Intellectual Property"** means all patents, rights to inventions, utility models, copyright and related rights, trade marks, logos, service marks, trade dress, business and domain names, rights in trade dress or get-up, rights in goodwill or to sue for passing off, unfair competition rights, rights in designs, rights in computer software, database rights, topography rights, moral rights, rights in confidential information (including know-how and trade secrets), methods and protocols for Services, and any other intellectual property rights, in each case whether capable of registration, registered or unregistered and including all applications for and renewals, reversions or extensions of such rights, and all similar or equivalent rights or forms of protection in any part of the world.

2.8. **"Parties"** means the Society and Client together.

2.9. **"Party"** means the Society or the Client.

2.10. **"Register"** means the register published annually by the Society.

2.11. **"Rules"** means the Society's classification rules, guidance notes and other documents. The Rules, procedures and instructions of the Society take into account at the date of their preparation the state of currently available and proven technical minimum requirements but are not a standard or a code of construction neither a guide for maintenance, a safety handbook or a guide of professional practices, all of which are assumed to be known in detail and carefully followed at all times by the Client.

2.12. **"Services"** means the services set out in clauses 2.2 and 2.3 but also other services related to Classification and Certification such as, but not limited to: ship and company safety management certification, ship and port security certification, training activities, all activities and duties incidental thereto such as documentation on any supporting means, software, instrumentation, measurements, tests and trials on board.

2.13. **"Society"** means the classification society 'Bureau Veritas Marine & Offshore SAS', a company organized and existing under the laws of France, registered in Nanterre under the number 821 131 844, or any other legal entity of Bureau Veritas Group as may be specified in the relevant contract, and whose main activities are Classification and Certification of ships or offshore units.

2.14. **"Unit"** means any ship or vessel or offshore unit or structure of any type or part of it or system whether linked to shore, river bed or sea bed or not, whether operated or located at sea or in inland waters or partly on land, including submarines, hovercrafts, drilling rigs, offshore installations of any type and of any purpose, their related and ancillary equipment, subsea or not, such as well head and pipelines, mooring legs and mooring points or otherwise as decided by the Society.

3. SCOPE AND PERFORMANCE

3.1. The Society shall perform the Services according to the applicable national and international standards and Industry Practice and always on the assumption that the Client is aware of such standards and Industry Practice.

3.2. Subject to the Services performance and always by reference to the Rules, the Society shall:

- review the construction arrangements of the Unit as shown on the documents provided by the Client;
- conduct the Unit surveys at the place of the Unit construction;
- class the Unit and enters the Unit's class in the Society's Register;
- survey the Unit periodically in service to note that the requirements for the maintenance of class are met. The Client shall inform the Society without delay of any circumstances which may cause any changes on the conducted surveys or Services.

The Society will:

- declare the acceptance or commissioning of a Unit, nor its construction in conformity with its design, such activities remaining under the exclusive responsibility of the Unit's owner or builder;
- engage in any work relating to the design, construction, production or repair checks, neither in the operation of the Unit or the Unit's trade, neither in any advisory services, and cannot be held liable on those accounts.

4. RESERVATION CLAUSE

4.1. The Client shall always: (i) maintain the Unit in good condition after surveys; (ii) present the Unit after surveys; (iii) present the Unit for surveys; and (iv) inform the Society in due course of any circumstances that may affect the given appraisement of the Unit or cause to modify the scope of the Services.

4.2. Certificates referring to the Society's Rules are only valid if issued by the Society.

4.3. The Society has entire control over the Certificates issued and may at any time withdraw a Certificate at its entire discretion including, but not limited to, in the following situations: where the Client fails to comply in due time with instructions of the Society or where the Client fails to pay in accordance with clause 6.2 hereunder.

5. ACCESS AND SAFETY

5.1. The Client shall give to the Society all access and information necessary for the efficient performance of the requested Services. The Client shall be the sole responsible for the conditions of presentation of the Unit for tests, trials and surveys and the conditions under which tests and trials are carried out. Any information, drawings, etc. required for the performance of the Services must be made available in due time.

5.2. The Client shall notify the Society of any relevant safety issue and shall take all necessary safety-related measures to ensure a safe work environment for the Society or any of its officers, employees, servants, agents or subcontractors and shall comply with all applicable safety regulations.

6. PAYMENT OF INVOICES

6.1. The provision of the Services by the Society, whether complete or not, involve, for the part carried out, the payment of fees thirty (30) days upon issuance of the invoice.

6.2. Without prejudice to any other rights hereunder, in case of Client's payment default, the Society shall be entitled to charge, in addition to the amount not properly paid, interests equal to twelve (12) months LIBOR plus two (2) per cent as of due date calculated on the number of days such payment is delinquent. The Society shall also have the right to withhold certificates and other documents and/or to suspend or revoke the validity of certificates.

6.3. In case of dispute on the invoice amount, the undisputed portion of the invoice shall be paid and an explanation on the dispute shall accompany payment so that action can be taken to solve the dispute.

7.7. LIABILITY

7.1. The Society bears no liability for consequential loss. For the purpose of this clause consequential loss shall include, without limitation:

- Indirect or consequential loss;
- Any loss and/or deferral of production, loss of product, loss of use, loss of bargain, loss of revenue, loss of profit or anticipated profit, loss of business and business interruption, in each case whether direct or indirect.

The Client shall save, indemnify, defend and hold harmless the Society from the Client's own consequential loss regardless of cause.

7.2. In any case, the Society's maximum liability towards the Client is limited to one hundred and fifty per-cents (150%) of the price paid by the Client to the Society for the performance of the Services. This limit applies regardless of fault by the Society, including breach of contract, breach of warranty, tort, strict liability, breach of statute.

7.3. All claims shall be presented to the Society in writing within three (3) months of the Services' performance or (if later) the date when the events which are relied on were first discovered by the Client. Any claim not so presented as defined above shall be deemed waived and absolutely time barred.

8. INDEMNITY CLAUSE

8.1. The Client agrees to release, indemnify and hold harmless the Society from and against any and all claims, demands, lawsuits or actions for damages, including legal fees, for harm or loss to persons and/or property tangible, intangible or otherwise which may be brought against the Society, incidental to, arising out of or in connection with the performance of the Services except for those claims caused solely and completely by the negligence of the Society, its officers, employees, servants, agents or subcontractors.

9. TERMINATION

9.1. The Parties shall have the right to terminate the Services (and the relevant contract) for convenience after giving the other Party thirty (30) days' written notice, and without prejudice to clause 6 above.

9.2. In such a case, the class granted to the concerned Unit and the previously issued certificates shall remain valid until the date of effect of the termination notice issued, subject to compliance with clause 4.1 and 6 above.

10. FORCE MAJEURE

10.1. Neither Party shall be responsible for any failure to fulfil any term or provision of the Conditions if and to the extent that fulfilment has been delayed or temporarily prevented by a force majeure occurrence without the fault or negligence of the Party affected and which, by the exercise of reasonable diligence, the said Party is unable to provide against.

10.2. For the purpose of this clause, force majeure shall mean any circumstance not being within a Party's reasonable control including, but not limited to: acts of God, natural disasters, epidemics or pandemics, wars, terrorist attacks, riots, sabotages, impositions of sanctions, embargoes, nuclear, chemical or biological contaminations, laws or action taken by a government or public authority, quotas or prohibition, expropriations, destructions of the worksite, explosions, fires, accidents, any labour or trade disputes, strikes or lockouts

11. CONFIDENTIALITY

11.1. The documents and data provided to or prepared by the Society in performing the Services, and the information made available to the Society, are treated as confidential except where the information:

- is already known by the receiving Party from another source and is properly and lawfully in the possession of the receiving Party prior to the date that it is disclosed;
- is already in possession of the public or has entered the public domain, otherwise than through a breach of this obligation;
- is acquired independently from a third party that has the right to disseminate such information;
- is required to be disclosed under applicable law or by a governmental order, decree, regulation or rule or by a stock exchange authority (provided that the receiving Party shall make all reasonable efforts to give prompt written notice to the disclosing Party prior to such disclosure).

11.2. The Society and the Client shall use the confidential information exclusively within the framework of their activity underlying these Conditions.

11.3. Confidential information shall only be provided to third parties with the prior written consent of the other Party. However, such prior consent shall not be required when the Society provides the confidential information to a subsidiary.

11.4. The Society shall have the right to disclose the confidential information if required to do so under regulations of the International Association of Classification Societies (IACS) or any statutory obligations.

12. INTELLECTUAL PROPERTY

12.1. Each Party exclusively owns all rights to its Intellectual Property created before or after the commencement date of the Conditions and whether or not associated with any contract between the Parties.

12.2. The Intellectual Property developed for the performance of the Services including, but not limited to drawings, calculations, and reports shall remain exclusive property of the Society.

13. ASSIGNMENT

13.1. The contract resulting from these Conditions cannot be assigned or transferred by any means by a Party to a third party without the prior written consent of the other Party.

13.2. The Society shall however have the right to assign or transfer by any means the said contract to a subsidiary of the Bureau Veritas Group.

14. SEVERABILITY

14.1. Invalidity of one or more provisions does not affect the remaining provisions.

14.2. Definitions herein take precedence over other definitions which may appear in other documents issued by the Society.

14.3. In case of doubt as to the interpretation of the Conditions, the English text shall prevail.

15. GOVERNING LAW AND DISPUTE RESOLUTION

15.1. The Conditions shall be construed and governed by the laws of

England and Wales.

15.2. The Society and the Client shall make every effort to settle any dispute amicably and in good faith by way of negotiation within thirty (30) days from the date of receipt by either one of the Parties of a written notice of such a dispute.

15.3. Failing that, the dispute shall finally be settled by arbitration under the LCIA rules, which rules are deemed to be incorporated by reference into this clause. The number of arbitrators shall be three (3). The place of arbitration shall be London (UK).

16. PROFESSIONAL ETHICS

16.1. Each Party shall conduct all activities in compliance with all laws, statutes, rules, and regulations applicable to such Party including but not limited to: child labour, forced labour, collective bargaining, discrimination, abuse, working hours and minimum wages, anti-bribery, anti-corruption. Each of the Parties warrants that neither it, nor its affiliates, has made or will make, with respect to the matters provided for hereunder, any offer, payment, gift or authorization of the payment of any money directly or indirectly, to or for the use or benefit of any official or employee of the government, political party, official, or candidate.

16.2. In addition, the Client shall act consistently with the Society's Code of Ethics of Bureau Veritas. <http://www.bureauveritas.com/home/about-us/ethics-and-compliance/>



GUIDANCE NOTE NI 650

NI 650

Guidelines for Existing Ships Operating in Polar Waters

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SECTION 1

GUIDELINES FOR EXISTING SHIPS OPERATING IN POLAR WATERS

1 General

1.1 Scope of the guidelines

1.1.1 This Guidance Note provides recommendations on the statutory requirements for the equipment and the operations of ships constructed before 1st January 2017 (hereafter named existing ships) in order to be compliant with the provisions of the IMO Polar Code and to carry a Polar Ship Certificate.

These guidelines are intended as a reference for shipyards, shipowners and Administrations in order to help them in the definition of the applicable statutory framework.

The application of these guidelines does not relieve the Interested Party from compliance with any requirements issued by the Administration.

When authorised by the Administration concerned, the Society will act on its behalf within the limits of such authorisation, in accordance with NR467, Pt A, Ch 1, Sec 1, [4].

1.2 IMO Polar Code

1.2.1 The International Maritime Organization (IMO) has developed the International Code for Ships Operating in Polar Waters (Polar Code), which contains both safety and environmental related provisions and is mandatory under SOLAS and MARPOL.

The goal of the Polar 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.

The Polar Code has been developed to supplement existing IMO instruments in order to increase the safety of ship's operation and mitigate the impact on the people and environment in the remote, vulnerable and potentially harsh polar waters.

The Polar Code covers the full range of design, construction, equipment, operational, training, search and rescue and environmental protection matters relevant to ships operating in waters surrounding the two poles.

1.3 Definitions

1.3.1 Administration

SOLAS REFERENCE: Chapter I, regulation 2(b)

Administration means the Government of the State whose flag the ship is entitled to fly.

1.3.2 Polar waters

SOLAS REFERENCE: Chapter XIV, regulation 1.4

Polar waters means Arctic waters and/or the Antarctic area. Fig 1 and Fig 2 are given for illustrative purposes only.

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

Arctic waters means those waters which are located.

- a) *north of a line from the latitude 58°00'.0 N and longitude 042°00'.0 W*
- b) *to latitude 64°37'.0 N, longitude 035°27'.0 W*
- c) *and thence by a rhumb line to latitude 67°03'.9 N, longitude 026°3'.4 W*
- d) *and thence by a rhumb line to the latitude 70°49'.56 N and longitude 008°59'.61 W (Sørkapp, Jan Mayen)*
- e) *and by the southern shore of Jan Mayen to 73°31'.6 N and 019°01'.0 E by the Island of Bjørnøya,*
- f) *and thence by a great circle line to the latitude 68°38'.29 N and longitude 043°23'.08 E (Cap Kanin Nos)*
- g) *and hence by the northern shore of the Asian Continent eastward to the Bering Strait*
- h) *and thence from the Bering Strait westward to latitude 60° N as far as Il'pyrskiy*
- i) *and following the 60th North parallel eastward as far as and including Etolin Strait*
- j) *and thence by the northern shore of the North American continent as far south as latitude 60° N*
- k) *and thence eastward along parallel of latitude 60° N, to longitude 056°37'.1 W*
- l) *and thence to the latitude 58°00'.0 N, longitude 042°00'.0 W.*

1.3.3 Ship category

POLAR CODE REFERENCE: Introduction, 2.1, 2.2, 2.3.

Categories of ships are defined as given in Tab 1.

Table 1 : Ship category

Category	Operation
A	Designed for operation in polar waters in at least medium first-year ice, which may include old ice inclusions.
B	Not included in category A designed for operation in polar waters in at least thin first-year ice, which may include old ice inclusions.
C	Designated to operate in open water or in ice conditions less severe than those included in categories A and B.

Figure 1 : Antarctic area

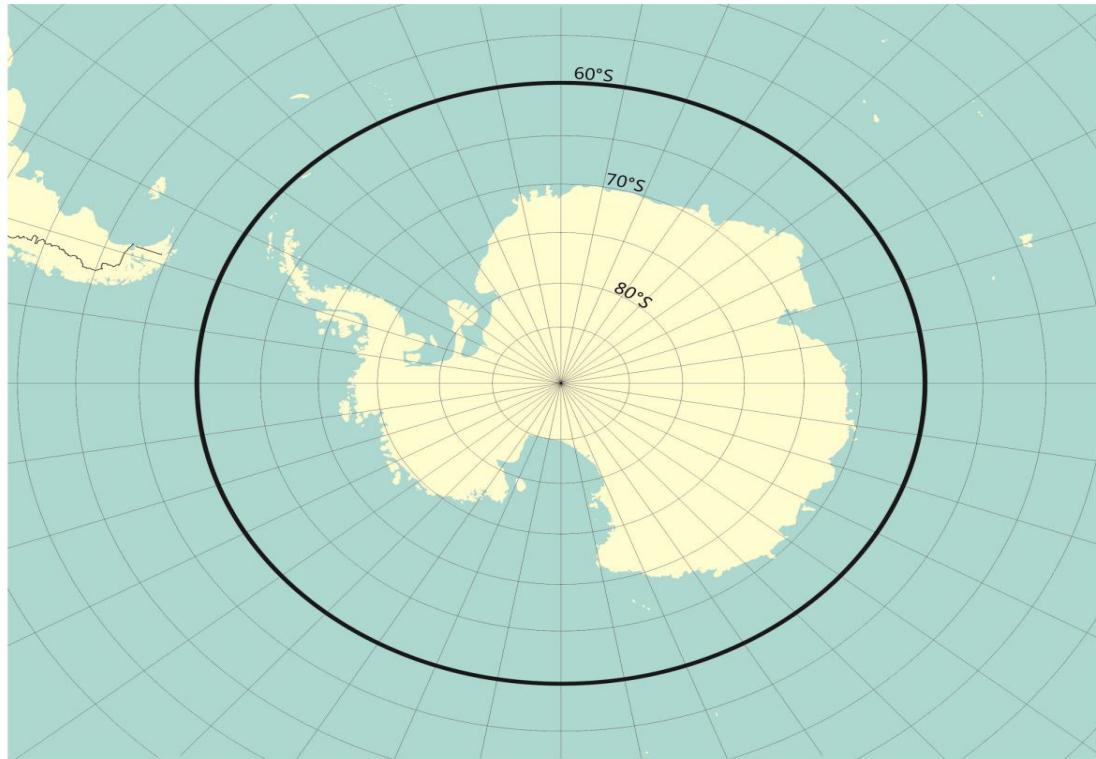


Figure 2 : Arctic waters



1.3.4 Ship constructed

SOLAS REFERENCE: Chapter XIV, regulation 1.5

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

1.3.5 At a similar stage of construction

SOLAS REFERENCE: Chapter XIV, regulation 1.6

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.

1.3.6 Ship operating in low air temperature

POLAR CODE REFERENCE: Part I-A, Chapter 1, 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 -10°C.

1.3.7 Mean daily low temperature (MDLT)

POLAR CODE REFERENCE: Part I-A, Chapter 1, 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 available.

Guidance instructions for determining MDLT:

- a) determine the daily low temperature for each day for a 10 year period,
- b) determine the average of the values over the 10 year period each day,
- c) plot the daily averages over the year,
- d) take the lowest of the averages for the season of operation.

1.3.8 Polar service temperature

POLAR CODE REFERENCE: Part I-A, Chapter 1, 1.2.11

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

1.3.9 Ice class

POLAR CODE REFERENCE: Part I-A, 1.2.6

Notation assigned to the ship by the Administration or by an organisation recognized by the Administration showing that the ship has been designed for navigation in sea-ice conditions.

1.3.10 Polar class

POLAR CODE REFERENCE: Part I-A, 1.2.10

The ice class (see [1.3.9]) assigned to the ship by the Administration or by an organisation recognized by the Administration based upon IACS Unified Requirements.

1.3.11 Ice accretion

INTACT STABILITY CODE REFERENCE: 6.3.3.8 to 6.3.3.10

Ice accretion takes place on ships operating at ambient temperature below -3°C and depending on the wind force.

1.3.12 Ice free waters

POLAR CODE REFERENCE: Introduction, 2.5

Ice free waters means no ice present. If ice of any kind is present this term shall not be used.

1.3.13 Open water

POLAR CODE REFERENCE: Introduction, 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 present.

1.3.14 Medium first-year ice

POLAR CODE REFERENCE: Introduction, 2.8

First-year ice of 0.7m to 1.2m thickness.

1.3.15 Thin first-year ice

POLAR CODE REFERENCE: Introduction, 2.15

First-year ice of 0.3m to 0.7m thickness.

1.4 References

1.4.1 To complement this Guidance Note, the following documents may be used as reference:

- Arctic Shipping Safety and Pollution Prevention Regulations, Canada Gazette Vol. 151, No. 26, July 2017
- Guide For Cold Water Survival, MSC.1/Circ.1185
- Findings from the search and rescue exercise (SARex) in Woodfjord, SSE 4/15, December 2016
- Report from SARex II, SSE 5/INF.3, December 2017.

2 Application

2.1 SOLAS ships

2.1.1 Application

The safety related provisions have been adopted in the resolution MSC.386(94) by adding the new chapter XIV Safety Measures For Ships Operating In Polar Waters under the SOLAS convention.

SOLAS REFERENCE: Regulation XIV/2.1

Unless expressly provided otherwise, this chapter applies to ships operating in polar waters, certified in accordance with chapter I.

This include all ships carrying a SOLAS Certificate as defined in Regulation I/12 and engaged on international voyages (ships which carry either a PSSC or a CSSC).

2.1.2 Entry into force

SOLAS REFERENCE: Regulation XIV/2.2

Ships constructed before 1st 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.

There is a grace period of one year for existing ships until 1st January 2018.

For passenger ships, the Polar Code should apply by the first renewal survey of the Passenger Ship Safety Certificate after 1st January 2018.

For cargo ships, the Polar Code should apply by the first intermediate or renewal survey of the Cargo Ship Safety Certificate whichever occurs first after 1st January 2018.

2.2 Non-SOLAS ships

2.2.1 Application

The regulations in chapter XIV are not applicable to non-SOLAS ships (e.g. fishing vessels).

At the time of the publication of this Guidance Note, discussions are under progress about the application of the Polar Code to non-SOLAS ships (refer to MSC 98/10/1 and MSC 98/INF.3).

Note 1: it is recommended to consult the Administration about the application of the Polar Code to ships regardless of tonnage or type.

2.3 MARPOL

2.3.1 Application

The environment related provisions have been adopted in the resolution MEPC.265(68) by amending the MARPOL convention under the following Annexes:

- Annex I is applicable to all existing ships
- Annex II is applicable to existing ships carrying Noxious Liquid Substances in bulk
- Annex IV is applicable to existing ships of 400 GT and above and existing ships of less than 400 GT carrying more than 15 persons
- Annex V is applicable to all ships.

Note 1: The Polar Code supplements the requirements for the Antarctic area, already designated as a special area in MARPOL Annex I, II and V.

Note 2: There is no additional requirement from the Polar Code for MARPOL Annex III and VI.

2.3.2 Entry into force

MEPC REFERENCE: 265(68) Paragraph 3

...the said amendments shall enter into force on 1 January 2017...

The requirements under MARPOL convention are applicable to existing ships since 1st January 2017 (regardless the ship is carrying a SOLAS certificate or not).

2.4 STCW

2.4.1 Entry into force

MSC REFERENCE: 416(97) Regulation V/4-6 and 7

The seafarers related provisions have been adopted in the resolution MSC.416(97) by amending the chapter I and V of the STCW convention and the Part A and B of the STCW code.

Those new regulations enter into force on 1st July 2018.

Considering there is a transitional period between the entry into force of the Polar Code (1st January 2017) and the amendments to the STCW convention (1st July 2018), seafarers applying for a Certificate of Proficiency, who com-

menced approved seagoing service in polar waters prior to 1st July 2018, have to establish during a two-year transition period (until 1st January 2020) that they have completed approved seagoing service or have successfully completed a training course meeting the guidance in section B-V/g of the STCW Code.

3 Safety measures

3.1 General

3.1.1 Certificate

The Polar Ship Certificate is a statutory document issued by the Administration to certify that the ship complies with the regulations of the safety related part of the Polar Code.

The Polar Ship Certificate includes the following information to define the capabilities and the limitations of the ship:

- category, ice class, ship type, ice restriction, low air temperature with associated PST, maximum expected type of rescue
- provision for alternative design if applicable
- operational limitations in term of ice conditions, temperature, latitudes (see App 2).

The Polar Ship Certificate is supplemented by a Record of Equipment to list all additional equipment required by the Polar Code for life-saving, navigation and communication.

These documents are required to be on board every ship entering into the Polar Waters and are requested by Port State Control and authorities.

3.1.2 Documentation

The Polar Water Operational Manual (PWOM) is a specific documentation to be carried on board ships having a Polar Ship Certificate. The PWOM should be part of the Safety Management documentation already required by the ISM Code. For more detailed information about the content of the PWOM, see App 3.

3.1.3 Survey

Unified interpretations on the initial and maintenance surveys have been adopted in MSC.1/Circ.1562.

Refer also to the IMO resolution A.1120(30), adopted in December 2017, about the Survey Guidelines Under The Harmonized System Of Survey And Certification (see App 1).

The survey under the Polar Code does not form a separate survey type and should be added to the existing survey under SOLAS. The validity of the Polar Ship Certificate does not affect the validity of other certificates under SOLAS.

The Polar Ship Certificate validity, survey dates and endorsements should be harmonized with the relevant SOLAS certificates.

For category C cargo ships, if no structural modifications or additional equipment are required by the Polar Code but possibly only operational requirements, the Polar Ship Certificate may be issued based on a documentation check (without onboard survey). In this case, an onboard survey should be undertaken at the next scheduled survey.

3.2 Operational assessment

3.2.1 General

An operational assessment of the ship and its equipment is required by the Polar Code in order to establish procedures and operational limitations. This assessment is to be carried out by the owner, using a risk analysis (e.g. HAZID) and should include the participation of representatives from the operator, crew and the designer, as well as risk expert.

The operational assessment is not approved by the Administration or its Recognised Organisation. However, it should be submitted for a verification of the consistency between the intended operations, the operational limitations on the Polar Ship Certificate and the procedures in the PWOM.

3.2.2 Methodology

The methodology may be based on the following steps:

- To define operating profile used to describe the expected environmental and operational conditions in the area where the ship is intended to trade. The operating profile may be defined on the following relevant information and available documentation:
 - season and area of operation
 - ice charts covering the season and area and giving the most likely ice conditions
 - temperature data for the season and area, over at least 10 years
 - operation with icebreaker escort
 - description of Search And Rescue (SAR) availability.
- To identify relevant hazards and any other hazards based on a review of the operating profile. The following sources of hazards have been listed in the Polar Code:
 - ice (sea ice regime, ice accretion, ice ingestion)
 - snow accumulation
 - low air and sea temperature
 - extended periods of darkness or daylight
 - high latitude
 - remoteness and possible lack of accurate and complete hydrographic data and information

- lack of ship crew experience in polar operations
- lack of suitable emergency response equipment
- rapidly changing and severe weather conditions
- environmental impacts.

- To develop a model in order to analyse risks, considering:
 - development of accident scenarios
 - probability of events in each accident scenario, and
 - consequence of end states in each scenario.
- To assess risks and to determine acceptability:
 - to estimate risk levels in accordance with the selected modelling approach, and
 - to assess whether the risk levels are acceptable.
- In the event that risk levels determined in the previous steps are considered to be too high, to identify current or develop new risk control options that aim to achieve one or more of the following:
 - to reduce the frequency of failures through better design, procedures, training, etc.
 - to mitigate the effect of failures in order to prevent accidents
 - to limit the circumstances in which failures may occur, or
 - to mitigate consequences of accidents.
- To incorporate risk control options for design, procedures, training and limitations, as applicable.

3.2.3 Outcome

The outcome of the operational assessment may be summarized in Tab 2.

3.3 Polar Water Operational Manual (PWOM)

3.3.1 General

The PWOM is a ship specific document to provide the crew, guidance on how to safely operate the ship in polar waters within the design limitations. This document is to be provided by the owner and should be prepared with qualified and experienced personnel with the involvement of the crew or the master.

Table 2 : Outcome of the operational assessment

Item	Main outcome	Additional outcome
Ice class selection	Ice class notation	Equivalency procedure when relevant
Ice accretion is likely to occur	yes / no	–
Snow accumulation is likely to occur	yes / no	–
Slush ice or ice ingestion are likely to occur	yes / no	–
Operating in low air temperature	yes / no	Polar Service Temperature (PST)
Freezing temperatures are likely to occur	yes / no	–
Operating at high latitude	yes / no	–
Operating during extended periods of darkness	yes / no	–
Operating during extended periods of daylight	yes / no	–
Scenario of abandonment	water / ice / land	Maximum Estimated Time of Rescue (ETR)
Operating with icebreaker escort	yes / no	–

3.3.2 Content

The PWOM should contain a methodology to determine the ship's capabilities and limitations in ice. In addition to already existing methodologies (e.g. Canada's AIRSS) the POLARIS system proposed by IACS has been accepted by the IMO (refer to MSC.1/Circ.1519)

The manual should address all hazards identified during the Operational assessment for which an operational mitigation measure is proposed. For example to avoid the effect of cold temperature or topside icing.

The PWOM should cover at least two types of operating conditions: normal and emergency.

For normal operations and in order to avoid encountering conditions that exceed the ship's capabilities the following procedures should be considered:

- voyage planning to avoid ice/or temperatures that exceed the ship's design capabilities or limitations
- arrangements for receiving forecasts of the environmental conditions
- means of addressing any limitations of the hydrographic, meteorological and navigational information available
- when a specific equipment is used as a mitigation measure, instructions about how to use this equipment
- implementation of special measures to maintain equipment and system functionality under low temperatures, topside icing and the presence of sea ice (or high latitudes)
- measures to be taken in the event of encountering ice and/or temperatures which exceed the ship's design capabilities or limitations.

For emergency conditions, in the event of incidents in polar waters, the following procedures should be considered:

- contacting emergency response providers for salvage, search and rescue, spill response ...
- maintaining life support and ship integrity in the event of prolonged entrapment by ice.

When the ship operates under icebreaker escort or in convoy, the PWOM should also consider different operational limitations: independently, escorted or in convoy.

Every PWOM should be adjusted for each ship, however, as a guidance, an example of a table of contents, based on the Polar Code Appendix II, is given in App 3.

3.4 Procedure for the issuance of the certificate

3.4.1 Information

For the issuance of the Polar Ship Certificate, the following non-exhaustive information are to be provided by the owner:

- ice class and ice strengthened draught range
- ship type: tanker/passenger ship/other
- ship restricted to operate in: ice free waters/open waters/other ice conditions
- ship intended to operate in low air temperature: Yes/No
- limitations at high latitudes.

In general, those information are part of the outcome of the operational assessment.

3.4.2 Documentation

The following non-exhaustive list of documents are to be submitted to the Society:

- operational assessment methodology and outcome
- PWOM
- General arrangement
- midship section, Shell expansion, Transverse sections, Construction Profile and Decks
- equivalency for a ship category, if applicable
- stability calculation booklet in intact conditions
- machinery arrangement (in particular sea chest arrangement)
- winterization arrangement and systems (de-icing and anti-icing systems)
- life saving and fire fighting appliances arrangement and specifications
- list of communication and navigational equipment
- sewage treatment plant arrangement when relevant.

3.4.3 Issuance of the certificate

POLAR CODE REFERENCE: Part I-A ,1.3.3

According to the Polar Code, for a category C ship, if the result of the operational assessment is that no additional equipment or structural modification are required, the Polar Ship Certificate may be issued based upon a verification of the documentation. In this case, for continued validity of the certificate, an on board survey should be undertaken at the next scheduled survey.

The procedure for the issuance of the certificate is represented by a flowchart in App 4.

3.5 Ship structure

3.5.1 Materials

POLAR CODE REFERENCE: Part I-A, 3.2.1

For ships intended to operate in low air temperature, the materials are to comply with the requirements of IACS UR S6, applicable at the date of the ship's construction, with regard to the assigned PST.

Note 1: Ships having a Polar Class notation are also to be compliant with the minimum steel grade requirements according to the IACS UR I2, applicable at the date of the ship's construction.

3.5.2 Scantlings

POLAR CODE REFERENCE: Part I-A,3.3.2

The scantlings of plates and framing members for ships of category A should be in accordance with the requirements of IACS UR I2, applicable at the date of the ship's construction, for at least PC 5 and for category B with the IACS UR I2 for at least PC 7.

The category A is granted to ships having a Polar Class notation PC 1 to PC 5.

The category B is granted to ships having a Polar Class notation PC 6 or PC 7.

The category A (resp. category B) is granted to ships not having a Polar Class notation and demonstrating an equivalent level of safety with at least PC 5 (resp. PC 7), otherwise, the category C is granted, provided that the scantlings are adequate for its intended operation.

If a non-compliance is found, service experience could be used in the risk assessment. If there is no record of damage in the deficient area, the equivalency may be acceptable by the Administration.

When category A or B ships are provided with an equivalency for Ice Class, this should be noted in the Polar Ship Certificate.

3.6 Subdivision and stability

3.6.1 Stability in intact conditions

POLAR CODE REFERENCE: Part I-A, 4.3.1

Stability of ships intended to operate where ice accretion is likely to occur is to be calculated with the minimum icing allowance specified in Polar Code Part I-A [4.3.1.1].

In case the weight of ice accretion used for the stability calculations is lower than the Polar Code allowance, it is necessary to re-evaluate the trim and stability booklet.

Information on the icing allowance included in the stability calculations should be provided in the PWOM.

When the ship fails to fulfil the stability criteria, operational procedures should be necessary and detailed in the PWOM in order to minimize the accretion of ice and to remain in the icing allowance used in the stability calculations.

Ships should be equipped with means for manual removing of ice (e.g. electrical and pneumatic devices or special tools such as axes or wooden clubs).

Ice accretion should be monitored (e.g. periodical human watch) to ensure that ice accretion does not exceed the icing allowances given in the PWOM.

3.6.2 Stability in damaged conditions

POLAR CODE REFERENCE: Part I-A, 4.3.2

Existing ships are exempted from calculation of residual stability to withstand flooding resulting from hull penetration due to ice impact.

3.7 Watertight and weathertight integrity

3.7.1 Ice and snow

POLAR CODE REFERENCE: Part I-A, 5.3.1

For ships intended to operate where ice accretion or snow accumulation are likely to occur means should be provided to remove or prevent ice accretion and snow accumulation around hatches and doors.

De-icing devices or procedures to mitigate the effect of ice or snow on all closing appliances should be provided.

3.7.2 Low air temperature

POLAR CODE REFERENCE: Part I-A, 5.3.2

For ships intended to operate in low air temperature, hydraulically operated closing appliances should be protected from the freezing or excessive viscosity of liquids.

Heating arrangements should be installed or hydraulic fluids should be qualified for operation at PST.

3.8 Machinery

3.8.1 Ice and snow

POLAR CODE REFERENCE: Part I-A, 6.3.1

The machinery and exposed deck equipment should be protected against the effect of ice accretion and snow accumulation.

When slush ice conditions are likely to occur, the sea inlets should be protected from ingestion of large ice particles (e.g. use of strainer plate).

The fresh air intakes, the pipes and associated fittings should be protected from ice accretion by electric or steam tracing devices. It is recommended to include procedures in the PWOM for the draining of systems in contact with ice or snow.

Specific arrangement should be provided for the protection of deck equipment and its access to mitigate the risk of ice formation (e.g. location in protected spaces, prevention of sea water spraying, use of tarpaulins).

The circulation on exposed decks should be facilitated by the use of appropriate gratings and stairs.

3.8.2 Low air temperature

POLAR CODE REFERENCE: Part I-A, 6.3.2

For ships intended to operate in low air temperature, the exposed machinery and electrical equipment should be capable of function at PST.

The temperature inside the machinery compartments is to be monitored and maintained above a minimum allowing the equipment to operate without any restrictions.

Whatever the category or the Ice Class of the ship, the materials of exposed machinery and foundations should be suitable for the PST and compliant with the IACS UR I3.

Ballast tanks partially or totally located above the waterline and adjacent to the shell or exposed deck should have efficient means to prevent freezing and any malfunction due to ice formation (e.g. heating coils, air bubbling systems).

3.8.3 Propulsion

POLAR CODE REFERENCE: Part I-A, 6.3.3

Ice-strengthened ships or having an Ice Class notation (see definition) should have propeller blades, propulsion line, steering equipment strengthened according to the requirements of an acceptable standard or of the assigned Ice Class notation.

The category A is granted to ships having a Polar Class notation PC 1 to PC 5.

The category B is granted to ships having a Polar Class notation PC 6 or PC 7.

The category A (resp. category B) is granted to ice-strengthened ships not having a Polar Class notation and demonstrating an equivalent level of safety with at least PC 5 (resp. PC 7), otherwise, the category C is granted.

3.9 Fire safety and protection

3.9.1 Ice and snow

POLAR CODE REFERENCE: Part I-A, 7.3.1 and 7.3.2

For ships intended to operate where ice accretion or snow accumulation are likely to occur, the components of the fire-fighting system should be protected from ice and snow and should be always accessible at all times. This include detectors, hydrants, hoses and nozzles.

Exposed pressure/vacuum valves should have anti-icing protection such as heat tracing or be insulated.

The fire pumps should be located in compartment where the temperature is maintained above freezing (risk is more likely to occur when the compartment is located above the ballast waterline).

When the fire pumps use a sea suction independent from the main sea chest and when slush ice conditions are probable, it is to be capable of clearing of any ice accumulation (e.g. by steam).

The exposed sections of piping should be protected against freezing and means of draining should be provided.

3.9.2 Low air temperature

POLAR CODE REFERENCE: Part I-A, 7.3.1 and 7.3.3

For ships intended to operate in low air temperature, the portable and semi-portable extinguishers should be located inside a heated compartment or protected from freezing temperatures. The extinguishers should be certified to be capable of operation at the PST.

All two-way portable radio communication equipment should be operable at the PST.

3.10 Life-saving appliances

3.10.1 Escape

POLAR CODE REFERENCE: Part I-A, 8.3.1

Escape routes should remain accessible and means should be provided to prevent or remove ice and snow from escape routes, muster stations, embarkation areas, survival craft and the launching appliances, several solutions could be considered:

- active solutions, such as to install heat tracing. In that case, the additional source of power should be able to operate independently of the ship's main source of power (e.g. from emergency switchboard).
- passive solutions, such as to enclose escape routes in order to avoid any source of water (sea spray or rain).
- procedural solutions, such as by manual remove of ice and snow or with the application of chemicals. In that case, the procedures should be included in the PWOM.

3.10.2 Evacuation

POLAR CODE REFERENCE: Part I-A, 8.3.2 and 1.4.2

Survival craft should be designed to be safely deployed on ice-covered waters. Free-fall lifeboats should not be

launched directly on ice but be lowered by the crew. The survival craft should be designed to sustain low air and water temperatures, extended periods of darkness or daylight, and should be large enough for the boarding of people wearing polar clothing.

For ships intended to operate in low air temperature, the life-saving appliances should be functional at the PST, in particular the release systems should be protected from the ice accretion or the effect of low air temperatures.

3.10.3 Survival

POLAR CODE REFERENCE: Part I-A, 8.3.3 and 1.4.3

The lifeboats should be of partially or totally enclosed type.

For ships operating in extended periods of darkness, the life-boats should be equipped with searchlights for a continuous use to facilitate identification of ice.

For ships intended to operate in low air temperature, survival systems and equipment should be fully operational at the PST during the maximum expected time of rescue (ETR).

Thermal protection should be provided to all person onboard (crew members and passengers) and should be effective to protect against the low temperature due to wind chill and cold water.

After the ship abandonment, in water, on ice or on land, resources should be provided to sustain life for the maximum expected time of rescue.

When the abandonment onto ice or land has been identified, both personal and group survival equipment should be provided for 110% of the persons aboard. These equipment should be stowed in an easily accessible location as close as practical to the muster or embarkation stations. When containers for group survival equipment are used, their should be floatable and easily movable over ice by two persons.

The crew must be trained in the use of both personal and group survival equipment. Passengers must be instructed in the use of personal survival equipment.

POLAR CODE REFERENCE: Part I-B, 9.1 and 9.2

a) The guidance part of the Polar Code suggest personal survival 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 (Food and fresh water ration should be in accordance with the LSA Code IV - 4.1.5.1. Means to heat water should be also provided)
- carrying bag.

b) The guidance part of the Polar Code suggest group survival 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 and water purification tablets
- spare set of personal survival equipment
- group survival equipment container (waterproof and floatable).

3.11 Safety of navigation

3.11.1 Nautical information

POLAR CODE REFERENCE: Part I-A – 9.3.1 and 9.3.2

Ships should have means of receiving and displaying current information on ice conditions. The navigational chart may not be accurate in polar waters, radars should be equipped with enhanced ice detection, in particular in shallow waters.

Ships should comply with SOLAS regulation V/22.1.9.4 irrespective of the size and, depending on the bridge configuration, should have a clear view astern (e.g. by means of camera monitoring).

3.11.2 Visibility

POLAR CODE REFERENCE: Part I-A, 9.3.3

Except when the ship is operating in areas with 24h daylight, it should be equipped with two remotely rotatable, narrow beam search lights over a total arc of 360°, controllable from the bridge to visually detect ice.

Ships involved in operations with an icebreaker escort should be equipped with a light to indicate when the ship is stopped, as follows:

- manual flashing red light should be visible from astern
- having a range of visibility of at least two nautical miles
- conform to the stern light specifications.

3.11.3 Heading and position

POLAR CODE REFERENCE: Part I-A, 9.3.2.2

Ships should have two non-magnetic means to determine and display the heading (e.g. gyrocompass). Both means should be independent and connected to both ship's main and emergency source of power.

For ships intended to operate at high latitudes (over 80°), the ship should be fitted with at least one GNSS compass or equivalent.

3.11.4 Ice, snow and low air temperature

POLAR CODE REFERENCE: Part I-A, 9.3.2.1.3 and 1.4.2

For ships intended to operate where ice accretion or snow accumulation are likely to occur, antennas required for navigation and communication should be protected against ice or snow.

For ships intended to operate in low air temperature, the navigation and communication equipment should be fully functional at the PST.

3.12 Communication

3.12.1 General

POLAR CODE REFERENCE: Part I-A, 1.4.2 and 10.3.2.3

Cold air temperature could have adverse effects on the battery capacity for the communication systems of the survival craft. In addition to keeping the portable devices in a warm environment, procedures should be adopted and included in the PWOM to maintain the battery power effective for the maximum expected time of rescue.

For ships intended to operate in low air temperature, all communication equipment hereafter mentioned should be fully functional at the PST.

For ships intended to operate at high latitudes (over 80°), communication equipment should rely on networks available at such latitudes (e.g. use Low-Earth Orbit systems instead of geo-stationary systems)

It is recommended to include procedures in the PWOM for an appropriate usage of the alerting and locating devices in order to avoid interferences between them.

3.12.2 Ship communications

POLAR CODE REFERENCE: Part I-A, 10.3.1

Equipment onboard should have the following capabilities:

- two-way voice and/or data communications for ship-to-ship and ship-to-shore
- voice and/or data communications with rescue coordination centres
- voice communication with aircraft on 121,5 MHz and 123,1 MHz
- two-way voice and data communications with a Tele-Medical Assistance Service (TMAS).

Ships providing icebreaking escort should be equipped with a sound signalling system mounted to face astern to indicate escort and emergency manoeuvres to following ships.

3.12.3 Survival craft and rescue boat communications

POLAR CODE REFERENCE: Part I-A, 10.3.2

For ships intended to operate in low air temperature, all rescue boats and lifeboats should carry after:

- one device for transmitting ship to shore alert (e.g. EPIRB)
- one device for transmitting signals for location (e.g. SART)
- one device for transmitting and receiving on-scene communications (e.g. portable or fixed VHF).

For ships intended to operate in low air temperature, all other survival craft (e.g. rafts) should carry:

- one device for transmitting signals for location (e.g. SART)
- one device for transmitting and receiving on-scene communications (e.g. portable or fixed VHF).

3.13 Voyage planning**3.13.1 General**

The goal of the planning is to ensure that the Company, master and the crew are provided with sufficient information to conduct the intended voyage through polar waters taking into account all the potential hazards.

3.13.2 Content

POLAR CODE REFERENCE: Part I-A, 11.3

When defining the voyage plan, the following aspects should be considered:

- the procedures required by the PWOM
- any limitations of the hydrographic information and aids to navigation available
- current information on the extent and type of ice and icebergs in the vicinity of the intended route
- statistical information on ice and temperatures from former years
- places of refuge
- 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
- current information on relevant ship's routing systems, speed recommendations and vessel traffic services relating to known areas with densities of marine mammals, including seasonal migration areas
- national and international designated protected areas along the route
- operation in areas remote from search and rescue capabilities.

3.14 Manning and training**3.14.1 General**

The Company should ensure that masters, chief mates and officers in charge of a navigational watch on board ships have completed the appropriate training according to the STCW convention and have enough experience in navigating in polar waters.

The use of an ice navigator to supplement the crew is allowed, provided that this person is STCW certified and meet the advanced training requirements. A sufficient number of persons with the appropriate qualification should cover all watches with the minimum hours of rest requirements satisfied.

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

3.14.2 Training certification

POLAR CODE REFERENCE: Part I-A, 12.3

The training certification is based on two levels: Basic and Advanced. The content of the training courses should be approved by the flag administration which will issue the certificate and approve the seagoing service. The model course for trainings are described respectively in the table A-V/4-1 and A-V/4-2 of the STCW Code.

The certificates should be renewed at least every five years.

Requirements are depending on the ship type and the ice conditions (see Tab 3).

Table 3 : Training requirements

Ice conditions	Tankers and Passenger ships	Other
Ice free	Not applicable	
Open water	<ul style="list-style-type: none"> • Master and chief mate: Basic training • Officers in charge of a navigational watch: Basic training 	N.A.
Other waters	<ul style="list-style-type: none"> • Master and chief mate: Advanced training • Officers in charge of a navigational watch: Basic training 	
N.A.: Not Applicable		

4 Pollution prevention measures**4.1 General**

4.1.1 Since there is no structural requirement for existing ships in Part II-A of the Polar Code, compliance can be achieved with operational procedures and updated documentation appropriately.

4.2 Prevention of pollution by oil

4.2.1 Summary

A summary of the applicable requirements for the prevention of pollution by oil is given in Tab 4. Attention is drawn to the fact that International or National regulations may impose other restrictions.

4.2.2 Operational requirements

POLAR CODE REFERENCE: Part II-A, 1.1

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

The discharge of clean or segregated ballast is allowed.

The discharge is already prohibited in the Antarctic area under the regulation 15.4 of MARPOL Annex I.

4.2.3 Certification

Amendments in MARPOL to the supplements to the International Oil Pollution Prevention Certificate (IOPP) Form A (other than oil tankers) and Form B (oil tankers) only refer to structural requirements of chapter 1 of Polar Code Part II-A.

As per paragraph 7 of MEPC.1/Circ. 856 it is recommended that existing ships are allowed to use the existing IOPP certificate until its expiry.

For category A ships that cannot comply with the provisions for oil or oily mixtures from machinery spaces and are operating continuously in Arctic waters for more than 30 days, and in accordance with the paragraph 9 of MEPC.1/Circ.

856, instead of a re-approval of the IOPP certificate, such ship should have a letter of approval issued by the Administration during the phase-in period.

4.2.4 Documentation

For Oil Record Book, Shipboard Oil Pollution Emergency Plan (SOPEP), Shipboard Marine Pollution Emergency Plan (SMPEP), the standard format is unchanged since the Polar Code does not introduce amendment under MARPOL Annex I.

However, for ships that have never been operated in polar waters, it is recommended to update the documentation either in accordance with the text as amended by the Administration or with the shipowner or operator procedures. In that case the documentation is to be re-approved as appropriate.

Some guidances about the oil spill management are available into the Guide to oil spill response in snow and ice conditions issued by the sub-committee on pollution prevention and response (PPR 3/22/Add.1).

4.3 Control of pollution by noxious liquid substances in bulk

4.3.1 Summary

A summary of the applicable requirements for the prevention of pollution by noxious liquid substances in bulk is given in Tab 5. Attention is drawn to the fact that International or National regulations may impose other restrictions.

Table 4 : Requirements for prevention of pollution by oil

Requirement	Application	Exemption
In Arctic waters any discharge into the sea of oil or oily mixtures is prohibited.	Any ships	
	Category A	<p>Ships that cannot comply with the provisions for oil or oily mixtures from machinery spaces and are operating continuously in Arctic waters for more than 30 days, are to comply with the provisions not later than the first intermediate or renewal survey, whichever comes first, one year after 1 January 2017.</p> <p>Until that date, such ships are to comply with the discharge requirements of regulation 15.3 of MARPOL Annex I.</p>
Operation in polar waters is to 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.	Any ships	

Table 5 : Requirements for prevention of pollution by noxious liquid substances

Requirement	Application
In Arctic waters any discharge into the sea of noxious liquid substances (NLS), or mixtures containing such substances, is prohibited.	Any ships
Operation in polar waters is to 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.	Any ships

4.3.2 Operational requirements

POLAR CODE REFERENCE: Part II-A, 2.1

In Arctic waters any discharge into the sea of noxious liquid substances (NLS), or mixtures containing such substances, from any ship is prohibited.

The discharge is already prohibited in the Antarctic area under the regulation 13.8 of MARPOL Annex II.

4.3.3 Certification

There is no amendment to the form of International Pollution Prevention Certificate for the Carriage of Noxious Liquid Substances in Bulk (NLS Certificate) or Certificate of Fitness.

4.3.4 Documentation

For the Cargo Record Book, the content is not amended by the Polar Code under MARPOL Annex II and therefore the standard format is unchanged.

For the Procedures and Arrangements Manual, in accordance with paragraph 13 of MEPC.1/Circ. 856, the approval by Administration of ship's P&A should be automatic, provided that modifications to paragraphs 1.3 and 4.4 of the manuals are in agreement with appendix 4 of MARPOL Annex II as amended by the Polar Code. This approval remains valid until the first scheduled survey related to the NLS Certificate or the Certificate of Fitness.

For the Shipboard Marine Pollution Emergency Plan (SMPEP) and Shipboard Marine Pollution Emergency Plan for Noxious Liquid Substances (SMPEP-NLS), the standard format is unchanged since the Polar Code does not introduce amendment under MARPOL Annex II.

However, for ships that have never been operated in polar waters, it is recommended to update the documentation either in accordance with the text as amended by the Administration or with the shipowner or operator procedures. In that case the documentation is to be re-approved as appropriate.

Some guidances about the oil spill management are available into the Guide to oil spill response in snow and ice conditions issued by the sub-committee on pollution prevention and response (PPR 3/22/Add.1).

4.4 Prevention of pollution by sewage from ships

4.4.1 Summary

A summary of the applicable requirements for the prevention of pollution by sewage is given in Tab 6. Attention is drawn to the fact that International or National regulations may impose other restrictions.

Note 1: Grey waters are not covered by MARPOL and are not included in the Polar Code.

4.4.2 Operational requirements

POLAR CODE REFERENCE: Part II-A, 4.2

For existing ships of any category, the discharge of sewage is allowed in similar way to what is required by MARPOL Annex IV and include distance (more than 3 nautical miles for communting and disinfecting system or 12 nautical miles for holding tank) to be taken from any ice-shelf or fast ice and as far as practical from areas of ice concentration exceeding 1/10.

For existing ships of any category, the discharge of sewage is allowed when fitted with an approved sewage treatment plant, without any restriction about the distance, but as far as practical from any ice-shelf or fast ice or areas of ice concentration exceeding 1/10.

For existing ships of Category A and B operating in ice concentrations exceeding 1/10 for extended periods of time, the discharge is allowed only by using an approved sewage treatment plant. Otherwise, the ship must be able to keep the sewage onboard in holding tanks while in the polar waters.

Note 1: State and local regulations may impose other restrictions for sewage discharge.

4.4.3 Certification

There is no amendment to the form of International Sewage Pollution Prevention certificate (ISPP).

Existing ships without any modification due to the Polar Code requirements (e.g. already equipped with sewage treatment plant) are allowed to use the existing ISPP certificate until its expiry.

4.4.4 Documentation

Procedures must take into account the capacities of the sewage holding tanks, for Category A and B ships not fitted with a sewage treatment plant and which plan to voyage in areas where ice concentrations is exceeding 1/10 for extended periods of time.

Table 6 : Requirements for prevention of pollution by sewage

Requirement	Application	Exemption
Discharges of sewage within polar waters are prohibited.	Any ships	Discharges of sewage may be performed in accordance with MARPOL Annex IV and the requirements of paragraph 4.2.1 of chapter 4 of Polar Code Part II-A
	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

4.5 Prevention of pollution by garbage from ships

4.5.1 Summary

A summary of the applicable requirements for the prevention of pollution by sewage is given in Tab 7. Attention is drawn to the fact that International or National regulations may impose other restrictions.

4.5.2 Operational requirements

POLAR CODE REFERENCE: Part II-A, 5.2

For existing ships of any category, the Polar Code limits the discharge of garbage into Polar Waters as it is required for special areas in MARPOL Annex V and in addition: 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; food waste are not to be discharged onto ice.

Note 1: State and local regulations may impose other restrictions for disposal of garbage.

4.5.3 Documentation

For the Garbage Record Book, amendments to the form in appendix of MARPOL Annex V have been introduced only to make reference to the Polar Code.

Consequently and in accordance with the paragraph 15 of MEPC.1/Circ. 856, the Garbage Record Book must be updated for existing ships without any need for approval.

Existing placards must be updated to remind the limitations of the Polar Code prior to entering into the Polar Waters.

For the Garbage Management Plans, the documentation must include appropriate procedures for any additional equipment used to manage garbage when operating in the Polar Waters.

Table 7 : Requirements for prevention of pollution by garbage

Requirement	Application	Exemption
In Arctic waters, discharge of garbage into the sea permitted in accordance with regulation 4 of MARPOL Annex V, shall meet the additional requirements of paragraph 5.2.1 of chapter 5 of part II-A	Any ships	N.A.
In the Antarctic area, discharge of garbage into the sea permitted in accordance with regulation 6 of MARPOL Annex V, shall meet the additional requirements of paragraph 5.2.2 of chapter 5 of part II-A	Any ships	N.A.
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.	Any ships	N.A.
N.A.: Not Applicable		

APPENDIX 1

SURVEY ITEMS TO BE CHECKED

1 Items to be checked

1.1 General

1.1.1 The following table summarise a non-exhaustive list of items to be checked during the initial, annual,

intermediate, periodical or renewal survey for compliancy with the safety part of the polar code.

Table 1 : Description of survey items

Description of the requirement	Operational and environmental conditions						Description of survey item
	General	Ice-covered waters	Low air temperatures	Ice accretion or snow accumulation	Extended periods of darkness or daylight	High latitude	
Polar Service Temperature		X					For ships intended to operate in low air temperature, confirming that the design service temperature of the systems and equipment required by this Code are consistent with the polar service temperature specified for the ship. [Initial Survey: Checking the certificates or equivalent documents of the systems and equipment required by this Code for the consistence of the design polar service temperature].
Maximum Expected Time of Rescue			X			X	For ships operating in low air temperature, confirming that the design maximum service time of the survival systems and equipment are consistent with the design maximum expected rescue time of the vessel at polar service temperature. [Initial Survey: Checking the certificates or equivalent documents of the survival systems and equipment for the consistence of the maximum expected rescue time at polar service temperature].
Operational assessment	X						Reviewing the operational assessment of the ship and its equipment, or any changes thereof and the impact on the applicable requirements.
Polar Water Operational Manual (PWOM)	X						Checking that the content of the PWOM is in accordance with the requirements of the Code and the hazards identified in the operational assessment are addressed properly. Confirming that the PWOM is on board, and checking it if any changes occurred since last survey.
Materials of exposed structures in ships and scantlings	X	X					Examining the plans and designs for materials of exposed structures and scantlings of the ship, confirming that materials and scantlings are according to the polar service temperature and ice strengthening standards, where applicable for the category of ship.
Scantlings of propeller blades, propulsion line, steering equipment and other appendages	X						Examining the plans and design of the scantlings of propeller blades, propulsion line, steering equipment and other appendages, confirming that they are approved according to the polar service temperature if applicable and ice strengthening standards, where applicable for the type of ship.

Description of the requirement	Operational and environmental conditions						Description of survey item
	General	Ice-covered waters	Low air temperatures	Ice accretion or snow accumulation	Extended periods of darkness or daylight	High latitude	
Ships shall have sufficient stability in intact conditions when subject to ice accretion				X			Confirming availability of approved stability information, and loading instrument as appropriate, with icing allowance in the stability calculations.
Designed to minimize the accretion of ice				X			Examining whether structures and installations are designed with a view of minimizing the accretion of ice.
Equipped with means for removing ice				X			Examining the means for removing ice as required by the Administration and mentioned in the PWOM.
Means to remove or prevent ice and snow accretion around hatches and doors and means to prevent freezing or excessive viscosity of liquids of hydraulic systems for hatches or doors				X			Examining the means to remove or prevent ice and snow accretion around hatches and doors. For ships intended to operate in low air temperature, examining the means for prevention of freezing or excessive viscosity of liquids for hydraulically operated hatches and doors as mentioned in the PWOM.
Watertight and weathertight doors, hatches and closing devices		X	X				For ships intended to operate in low air temperature, confirming the design of the watertight and weathertight doors, hatches and closing devices not within habitable environment are operable by personnel wearing heavy winter clothing including thick mittens.
Machinery installations and associated equipment	X		X				Examining the means for protecting machinery installations and associated equipment 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.
Exposed machinery and electrical installation and appliances	X	X	X				Confirming that the exposed machinery and electrical installation and appliances are fit for the polar service temperature.
Means 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	X	X	X				Examining and testing the means 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.
Materials of exposed machinery and foundations	X	X	X				Examining the plans for materials of the exposed machinery and foundations, confirming that the materials are approved according to applicable standards, taking into account the polar service temperature and the required ice strengthening.
All components of fire safety systems and appliances if installed in exposed positions			X				Examining that all components of fire safety systems and appliances if installed in exposed positions are protected from ice accretion and snow accumulation according to the operational assessment.
The design of fire safety systems and appliances			X				Examining the design of fire safety systems and appliances for operation by persons wearing bulky and cumbersome cold weather gear including gloves, where appropriate

Description of the requirement	Operational and environmental conditions						Description of survey item
	General	Ice-covered waters	Low air temperatures	Ice accretion or snow accumulation	Extended periods of darkness or daylight	High latitude	
Means to remove or prevent ice and snow accretion from accesses				X			Examining the means to remove or prevent ice and snow accretion from accesses of fire safety systems and appliances, escape routes, muster stations, embarkation areas, survival craft, its launching appliances and access to survival craft according to the PWOM.
All components of fire safety systems and appliances shall be designed to ensure availability and effectiveness under the polar service temperature			X	X			
Extinguishing media				X			Confirming that the extinguishing media is suitable for the intended operation.
Isolating and pressure/vacuum valves in exposed locations				X			Examining that the isolating and pressure/vacuum valves in exposed locations are protected from ice accretion and remain accessible at all time.
Two-way portable radio communication equipment		X	X				Examining that all two-way portable radio communication equipment capable to operate at the polar service temperature.
Fire pumps including emergency fire pumps, water mist and water spray pumps				X			Examining that the fire pumps including emergency fire pumps, water mist and water spray pumps are located in compartments maintained above freezing.
Fire main, fire hoses and nozzles				X			Examining the arrangement of the fire main if the exposed sections could be isolated and means of draining of exposed sections are provided, and, where fixed water-based fire extinguishing systems are located in a space separate from the main fire pumps and use an own sea suction, confirming that this sea suction is capable of being cleared of ice accumulation
Firefighter's outfits				X			Examining that the firefighter's outfits are stored in warm locations on the ship.
Portable and semi-portable extinguishers			X	X			Examining that portable and semi-portable extinguishers are protected from freezing temperatures, and confirming that locations subject to freezing are provided with extinguishers capable of operation under the polar service temperature.
Materials of exposed fire safety systems			X	X			Examining the plans for the materials of exposed fire safety systems confirming that they are approved according to the polar service temperature and ice strengthening standards.
Embarkation arrangements			X	X			Examining the adequacy of embarkation arrangements, with full regard to any effect of persons wearing additional polar clothing.
Safe evacuation of persons		X					Examining the 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.
Sources of power of the additional devices	X						Examining that lifesaving appliances and arrangements as required by Polar Code, if using devices requiring a source of power are able to operate independently of the ship's main source of power.

Description of the requirement	Operational and environmental conditions						Description of survey item
	General	Ice-covered waters	Low air temperatures	Ice accretion or snow accumulation	Extended periods of darkness or daylight	High latitude	
Passenger ship, immersion suit or thermal protective aid	X						Examining that a proper sized immersion suit of the insulated type or a thermal protective aid is provided for each person on board according to the risk assessment.
Immersion suits	X						Examining that all the immersion suits equipped on board are of the insulated type.
Searchlights of lifeboat				X			Examining that for ships intended to operate in extended periods of darkness, searchlights suitable for continuous use to facilitate identification of ice are provided for each lifeboat.
Lifeboat	X						Confirming that the lifeboats are of the partially or totally enclosed type, as appropriate.
Appropriate survival resources	X						Examining that, when personal or group survival equipment is required according to the operational assessment, personal and group survival equipment sufficient for 110% of the persons on board is stowed in easily accessible locations; containers for group survival equipment are designed to be easily movable over the ice and floatable, and that means of insuring that personal and group survival equipment is accessible following abandonment is provided.
Capacity of the survival craft and launching appliances	X						Check that the survival craft and launching appliances have sufficient capacity to accommodate the additional personal and group survival equipment if required and carried in addition to persons and that adequate emergency rations are provided for the maximum expected time of rescue.
Instructions to passengers	X						Confirming that the instructions to passengers are provided on board.
Qualification of the crew	X						Confirming that drills with the crew were carried out to train the use of the personal survival equipment and group survival equipment.
Means of receiving and displaying the ice information	X						Examining the means of receiving and displaying the information on ice conditions in the area of operation.
Navigation bridge visibility	X						Confirming that clear view astern is achieved. For ships built before 1 July 1998 and with a length of less than 55m, check that, clear-view navigation bridge front windows are provided.
Means to prevent the accumulation of ice on antennas				X			Where ice accretion is likely to occur, examining the means to prevent the accumulation of ice on antennas required for navigation and communication.
Sensors of navigational equipment		X					Examining that sensors for navigational equipment, required either by SOLAS or the Code, projecting below the hull are protected against ice. Only for Renewal survey to be inspected in dry dock.
Systems for providing reference heading	X						Examining the two independent non-magnetic means for heading information, and at least one GNSS compass or equivalent for ships intended to proceed to latitudes over 80 degrees, connected to the ship's main and emergency source of power

Description of the requirement	Operational and environmental conditions						Description of survey item
	General	Ice-covered waters	Low air temperatures	Ice accretion or snow accumulation	Extended periods of darkness or daylight	High latitude	
Search lights	X						Examining that 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, are equipped if the ship not operating solely in 24h daylight, and examining that a manually initiated flashing red light visible from astern to indicate when the ship is stopped is available, for ships might be involved in operations with an icebreaker escort.
Communications ship-to-ship and ship-to-shore	X						Examining that the communication equipment on board has 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.
Communications for escort and convoy operations					X		For ships intended to provide icebreaking escort, examining the sound signalling system capable to be mounted to face astern.
Two-way on-scene and SAR coordination communications	X						Examining the means for two-way on-scene and SAR coordination communications for search and rescue purposes including aeronautical frequencies operations and that communication equipment provides for two-way voice and data communication with a Telemedical Assistance Service (TMAS).
Lifeboats and rescue boats communications capabilities			X				For ships intended to operate in low air temperature, examining that each rescue boats and lifeboats is capable to be provided with devices for transmitting signals for distress alerting, locating and on-scene communications.
Survival crafts communications capabilities			X				For ships intended to operate in low air temperature, examining the capabilities of all other survival craft, for transmitting signals for location and for communication.
Mandatory communication equipment for use in survival craft, operable during the maximum expected time of rescue	X						Confirming that procedures are provided on board for availability of the mandatory communication equipment for use in survival craft, including availability of battery power for the maximum expected time of rescue.
Voyage Planning	X						Confirming that the Voyage Plan has been provided on board for the voyages in Polar Waters since last survey, otherwise if no trading in polar waters, random checking to the historical plans may be considered.
Manning and training	X						Where applicable, checking the qualifications of the masters, chief mates, officers and/or other persons in charge of a navigational watch on board ships operating in polar waters in accordance with chapter V of the STCW Convention and the STCW Code.

APPENDIX 2

OPERATIONAL LIMITATIONS IN THE POLAR SHIP CERTIFICATE

1 Operational limitations

1.1 General

1.1.1 The Polar Ship Certificate includes in its part 5 an assessment of the ship limitations with respect to the ice conditions, temperatures and latitudes. Those limitations should be consistent with the outcome of the operational assessment.

Considering the wording used for defining these limitations is also of importance to have a standard implementation among all classifications societies, IACS submitted a paper (MSC 94/3/8) proposing Guidance on the setting of operational limitations.

The recommended wording is described hereafter for each operational limitation. In general, it is considered inappropriate to let free text space on the statutory certificate.

1.2 Ice conditions

1.2.1 For the limitations on ice conditions (see 5.1 on Polar Ship Certificate), the proposed wording is as per Tab 1:

Table 1 : Ice conditions limitations

Limitations on ice conditions	Proposed wording
Ships operating in ice-free waters (see definitions)	Limited to ice-free waters.
Ships operating in other ice conditions	Limited to operations in polar waters appropriate to the ice strengthening applied and the requirements of a system for determining operational limitations approved for use on the ship by the Administration. Name of system..... Reference document number..... Date issued..... A description of the system, ship-specific limitations and guidance on using the system, with example calculations, is/is not included in the PWOM.

Where the name of system could be for example: AIRSS, POLARIS, Ice Certificate...

For the POLARIS system, which is supported by the IACS, refer to MSC.1/Circ.1519.

1.3 Temperatures

1.3.1 For the limitations on temperatures (see 5.2 on PSC), the proposed wording is as per Tab 2:

Table 2 : Temperatures conditions limitations

Limitations on temperatures conditions	Proposed wording
Ships intended to operated in low air temperatures	Limited to operations in polar waters where the expected lowest Mean Daily Low temperature for the area and season of operation is greater or equal to "specify the PST assigned on the Certificate plus 10 degrees".
Ships not intended to operated in low air temperatures	Limited to operations in polar waters where the expected lowest Mean Daily Low temperature for the area and season of operation is greater or equal to - 10 degrees.

1.4 Latitudes

1.4.1 For the limitations on latitudes (see 5.3 on Polar Ship Certificate), the proposed wording is as per Tab 3:

Table 3 : Latitudes conditions limitations

Limitations on latitudes conditions	Proposed wording
Ships with communication and/or navigation systems limited with respect to coverage at high latitudes	Limited to operations in polar waters between the operational latitude range of – degrees north and – degrees south.
Ships without limitations	No limitations.

APPENDIX 3

POLAR WATER OPERATIONAL MANUAL
(PWOM)

1 General

1.1 Application

1.1.1 The Polar Water Operational Manual (PWOM) is intended to address all aspects of operations. 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 document.

As a guidance, a table of contents is given in this Appendix. Not every section will be applicable to every polar ship. For instance for 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.

Noting an aspect as 'not applicable' also indicates that this aspect has been considered and not merely omitted.

1.2 Table of contents

1.2.1 A detailed table of contents with guidances are given in Tab 2 to Tab 5 for each division of the PWOM listed in Tab 1.

Table 1 : Contents of PWOM

Division	Title
1	Operational capabilities and limitations
2	Ship operations
3	Risk management
4	Joint operations

Table 2 : Contents for operational capabilities and limitations

1 - OPERATIONAL CAPABILITIES AND LIMITATIONS	
Chapter 1 - Operation in ice	
1.1 - Operator guidance for safe operation	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 Polar Ship Certificate. An appropriate decision support system, such as the Canada's Arctic Ice Regime Shipping System, and/or the Russian Ice Certificate as described in the Rules of Navigation on the water area of the Northern Sea Route, can be used (1). 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	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	No guidance.
1.4 - Special features	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	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 navigation capabilities in high latitudes	
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	
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.	
(1) Guidance on methodologies for assessing operational capabilities and limitations in ice (POLARIS) as described in IMO Circular MSC.1/Circ.1519, can also be used.	

Table 3 : Contents for ship operations

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	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	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	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	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	
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	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	No guidance.
Chapter 3 - Verification of hydrographic, meteorological and navigational information	
The PWOM should provide guidance on the use of hydrographic information.	
Chapter 4 - Operation of Special Equipment	
4.1 - Navigation systems	No guidance.
4.2 - Communication systems	No guidance.
Chapter 5 - Procedures to maintain equipment and system functionality	
5.1 - Icing prevention and de-icing	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	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 suctions, etc.
5.3 - Procedures for low temperature operations	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.

Table 4 : Contents for risk management

3 - RISK MANAGEMENT	
Chapter 1 - Risk mitigation in limiting environmental condition	
1.1 - Measures to be considered in adverse ice conditions	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	The PWOM should contain guidance on operational restrictions in the event that temperatures below the ships 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	
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	the PWOM should consider damage control measures arrangements for emergency transfer of liquids and access to tanks and spaces during salvage operations.
2.2 - Fire-fighting	No guidance.
2.3 - Escape and evacuation	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	The PWOM should include procedures to be followed in preparing for a voyage and in the event of an incident arising.
3.2 - Salvage	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	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	
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	No guidance.
4.2 - System operation	No guidance.

Table 5 : Contents for joint operations

4 - JOINT OPERATIONS	
Chapter 1 - Escorted operations	
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	No guidance.

APPENDIX 4

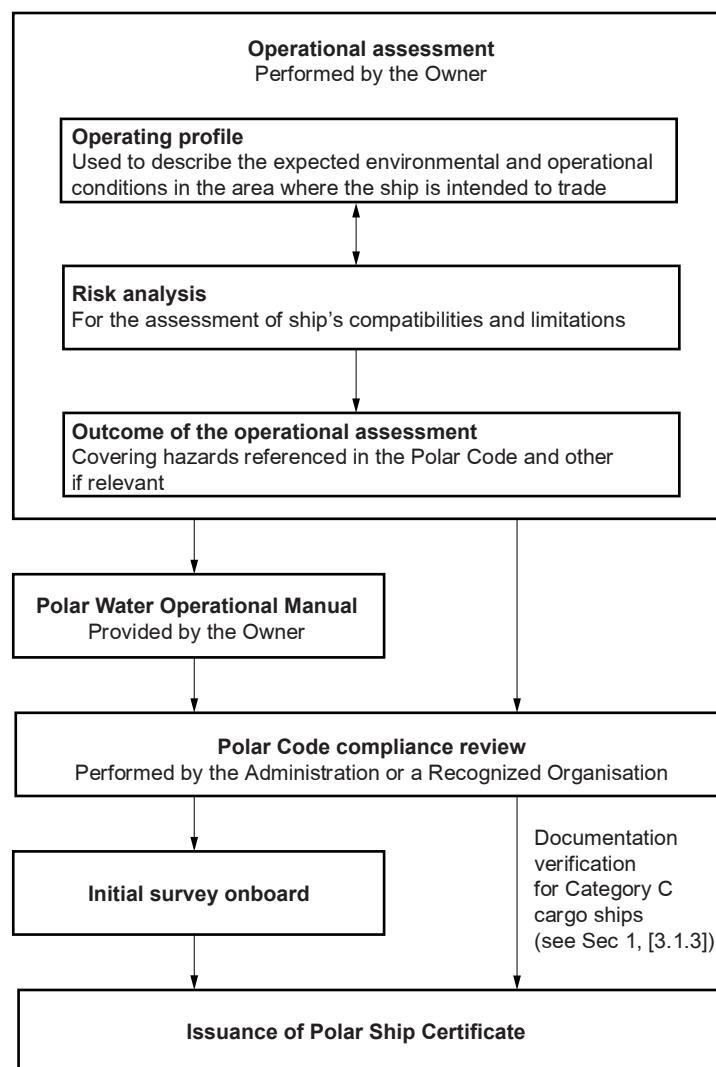
POLAR SHIP CERTIFICATE PROCESS

1 General

1.1 Process

1.1.1 The flow chart in Fig 1 describes the main steps of the process for the issuance of the Polar Ship Certificate.

Figure 1 : Process flow chart



APPENDIX 5

TEMPLATE FOR OPERATIONAL ASSESSMENT

1 General

1.1 Template

1.1.1 The template in Tab 1 may be used during a risk analysis for the operational assessment.

Table 1 : Template for operational assessment for hull structure

Hazard category navigation and operation in...	Guideword	Causes	Consequence	Safeguard	Risk ranking (1)		
					F.I.	S.I.	R.I.
extreme weather	Low temperature	Cold air temperature	Potential hull brittle fracture	Polar service tem- perature greater than -20°C			
				No operation in polar waters during winter			
	Storms	Temperature of sea water	Not an issue sea water temperature greater than 0°C during ship operation				
		Static electricity	Not an issue				
		Magnetic storm Aurora borealis	Not an issue				
	Snow and ice	Lightning	Not an issue				
		Snow accumulation	Not an issue				
		Ice formation	Not an issue				
		Ice accretion	Not an issue				
extreme conditions	Geographi- cal features	High latitudes	Not an issue				
		Extended period of darkness or day light	Not an issue				
	Sea ice	Ice cover	Local hull damage Potential hull deformation	Ice radar			
				Ice chart service subscription			
		Ice floes	N.A., Sailing only in open water				
		Icebergs	N.A., Sailing only in open water				
		Ice channel edges	N.A., Sailing only in open water				
		Ice ridges	N.A., Sailing only in open water				
		Hummocks	N.A., Sailing only in open water				
		Ice compression	N.A., Sailing only in open water				
		Ice jet	N.A., Sailing only in open water				
	Navigation specificities	Navigation with ice breaker	N.A. in normal operation Only in emergency situation				
		Navigation in channel and port	Nothing specific linked to the naviga- tion in polar waters				
		Reduced visibility	Not an issue				

(1) F.I.: Frequency Index

S.I.: Severity Index

R.I.: Risk Index

Note 1: N.A.: Not Applicable



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