DNV·GL

MARITIME

POLAR CODE

Understand the code's requirements to take the right steps for smooth compliance.

SAFER, SMARTER, GREENER

CONTENTS

WELCOME

Today, we see not just interest in the polar regions, but a real increase in commercial activity. The stunning natural beauty of Antarctica and the Arctic lures tens of thousands of tourists each year to visit these far reaches of our planet, most travelling by ship. Melting ice opens other business opportunities, too, with some regarding the Arctic as an emerging commercial hotspot.

Sailing in polar waters brings on new challenges and risks, not only for the ships that sail them, but also for the polar environment and those dependent on it. Through its adoption of the International Code for Ships Operating in Polar Waters – the Polar Code – the IMO and its members recognize the importance of helping ship owners to manage these risks and to protect the environment in these regions.

DNV GL is ready and able to help you. Polar shipping has long been a strategic priority for us. Today, we class some 25 percent of the ships that visit Arctic and Antarctic waters each year. In 2016, nearly 2,300 ships were operating in polar waters, of which 1,500 will need to comply with the Polar Code. In customer workshops, we are already advising our customers on the implications of the Polar Code for their vessels and certifying them for polar operations. In February 2016, DNV GL issued the first Polar Ship Certificate to *Magne Viking*, an ice-going anchor-handling vessel, on behalf of the Danish Maritime Authority.

In this brochure, you will find information on how the Polar Code applies to your vessels, what you need to do, and how DNV GL can help you. We look forward to being your partner for safe, successful polar operations.

Knut Ørbeck-Nilssen
CEO, DNV GL - Maritime

WHO IS AFFECTED BY THE POLAR CODE?

The International Maritime Organization has adopted a mandatory Polar Code to provide for safe ship operation and environmental protection in the polar regions. If you operate a SOLAS or MARPOL ship in Arctic or Antarctic waters, then your ship will soon need to comply with all or part of this Code.

What is the purpose of the Polar Code?
The International Code for Ships Operating in Polar Waters (the Polar Code) is a new code adopted by the IMO. The Code acknowledges that polar waters may impose additional demands on ships beyond those normally encountered. It provides a mandatory framework for ships operating in polar waters.

The main requirements are related to safety, protection of the environment, and seafarer competence, and it is implemented through amendments to SOLAS, MARPOL and the STCW.

Where does it apply?
The Polar Code applies to certain ships that will operate on domestic or international voyages in Arctic or Antarctic waters (see right page).

Who does it apply to?
The Polar Code applies to ships, depending on their international certification requirements, as follows:

- Part I safety requirements and Part I manning and training requirements apply to ships certified in accordance with SOLAS and which operate in polar waters.
- Part II environmental protection requirements apply to ships that must comply with MARPOL and which operate in polar waters.

For non-SOLAS ships that are required to hold a MARPOL certificate (such as fishing vessels), only the Part II environmental protection requirements of the Polar Code apply.

Ship specific example cases

A new passenger ship will operate in both Arctic and Antarctic waters and has both SOLAS and MARPOL certificates. It must comply with both Part I safety and Part II environmental protection requirements of the Polar Code as of 1 January 2017, and with the Part I manning and training requirements as of 1 July 2018.

An existing cargo ship will operate in Arctic waters and has both SOLAS and MARPOL certificates. It must comply with the Part II environmental protection requirements as of 1 January 2017, with Part I manning and training requirements as of 1 July 2018, and with Part I safety requirements as of its first intermediate or renewal survey after 1 January 2018.

An existing fishing vessel operating in Arctic waters has a MARPOL certificate but not a SOLAS certificate. It must comply with Part II environmental protection requirements as of 1 January 2017. It does not need to comply with Part I safety or manning and training requirements.

Note!
Flag administrations may set special or additional requirements for ships of their flag, and should always be consulted on how and to whom they apply the Polar Code.

When does it come into force? The Polar Code has several different implementation dates.

PART I (SOLAS)	PART I (STCW)
Safety requirements are phased in for new and existing ships as follows: ■ New ships (ships built on or after 1 January 2017) must comply with Part I upon delivery. ■ Existing ships (ships built before 1 January 2017) must comply with Part I by their first intermediate or renewal survey after 1 January 2018.	**Manning and training requirements** come into force for both new and existing ships.

1 January 2017 | 1 January 2018 | 1 July 2018

PART II (MARPOL)
Environmental protection requirements come into force for new and existing ships

POLAR WATERS

The Polar Code applies to ships operating in polar waters, whether engaged on international or domestic voyages. Polar waters are defined by the Code as the following areas:

ARCTIC AREA

The waters north of latitude 60°N, with deviations to include waters around the southern exposure of Greenland, but excluding those around Iceland, the Norwegian mainland, Russia's Kola Peninsula, the White Sea, the Sea of Okhotsk and Alaska's Prince William Sound.

The waypoint coordinates on the Arctic area map are:

60°N, 56°37.1'W

58°N, 42°W

64°37'N, 35°27'W

67°03.9'N, 26°33.4'W

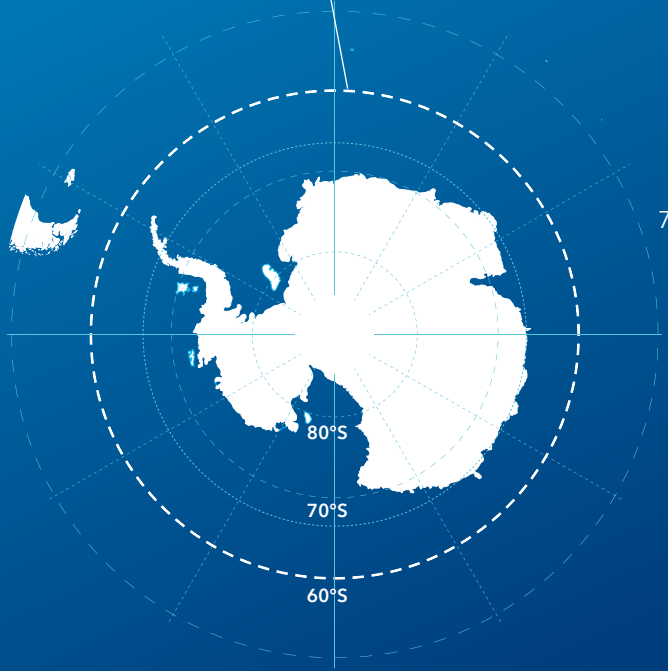
70°49.56'N, 8°59.61'W (Jan Mayen)

73°31.6'N, 19°01'E (Bjørnøya)

68°38.29'N, 43°23.0'E (Cap Kanin Nos)

ANTARCTIC AREA

All waters south of latitude 60°S



HOW TO COMPLY WITH THE POLAR CODE

To comply with the Polar Code, a ship and its crew must be certified for operations in polar waters. When in polar waters, the ship must be operated within the limitations stated on its Polar Ship Certificate and follow the operational requirements in the Code.

Regulatory requirements

Ship owner and operator need to take a number of actions for achieving compliance with the Polar Code requirements, including:

PART I-A:

- carrying a Polar Ship Certificate on board,
- developing and carry a polar water operation manual on board,
- carrying the right training certificate from the respective flag state on board as required by the Polar Code § 12 and STCW, and
- performing voyage planning before every voyage to polar waters following the instructions in the PWOM as required in Polar Code §11.

PART II-A:

On-board documentation concerning pollution prevention needs to be updated to take operation in polar waters into account, including requirements from MARPOL Chapters I, II, IV and V.

The Polar Ship Certificate

SOLAS ships operating in polar waters will require a Polar Ship Certificate. This is a new statutory certificate issued by a vessel's flag administration or its authorized representatives.

The Certificate attests that the ship complies with the ship safety requirements in Part I-A of the Polar Code. To obtain a Polar Ship Certificate, the owner must:

- conduct an operational (risk) assessment of the ship and its intended operations in polar waters;
- prepare a Polar Water Operational Manual (PWOM) specific to the ship, its arrangement and its intended operation in polar waters;
- have the ship surveyed to verify its compliance with the relevant requirements of the Polar Code; and
- apply to its flag administration or authorized representative for the Polar Ship Certificate.

DNV GL is an authorized representative for most flag administrations. We will assist you with the steps above and either issue the Polar Ship Certificate directly on behalf of your flag administration, or issue you a certificate of compliance.

More information on our certification services are outlined in the table on page 9.

Crew certification
Part I-A §12 of the Polar Code requires a ship owner to ensure that officers on SOLAS ships operating in polar waters have completed special training and have the necessary competence to carry out their duties. These training and competence requirements will be implemented in an upcoming amendment to the STCW.

The planned STCW amendment will require certain masters, chief mates and officers in charge of a navigational watch to obtain a certificate of competence from their licensing authority.

Ship owners and operators should contact the relevant mariner licensing authority for their crew to determine what they need to do.

Mariner licensing is not delegated to class societies. Therefore, DNV GL does not evaluate mariner training or issue certificates of competence as part of its Polar Code compliance activities for ship owners.

MARPOL certificates
An entry in the Supplement to the International Oil Pollution Prevention (IOPP) Certificate is required for a new Category A and B ship to certify that they comply with the additional structural requirements on tank protection in Part II-A § 1.2 of the Polar Code.

No structural modifications are required of Category C ships or of existing Category A or B ships, therefore no entries in the IOPP Certificate are required.

No other MARPOL certificates are affected by the Polar Code.

Operational compliance – Safety
The Polar Code includes certain acts and prohibitions for ships while operating in polar waters. SOLAS ships must comply with all operational safety requirements in Part I-A of the Polar Code, including:

- conducting a proper voyage plan,
- operating the vessel within the capabilities and limitations stated on its Polar Ship Certificate;
- monitoring snow and ice accumulation on the ship and taking appropriate measures to ensure it does not exceed stability values;
- keeping safety equipment, escape routes and survival craft clear of snow and ice accumulation;
- instructing passengers in the use of survival equipment and the actions to take in an emergency;
- training the crew in the use of personal and group survival equipment; and
- training each crew member in the procedures and equipment described in the Polar Water Operational Manual relevant to their assigned duties.

Operational compliance – Environmental protection
MARPOL ships must comply with operational environmental protection requirements in Part II-A of the Polar Code:

- Any discharge of oil, oily mixtures or noxious liquid substances in polar waters is prohibited.
- Discharge of sewage and garbage in polar waters is only allowed in line with the additional restrictions.
- Operation in polar waters in the relevant record books, manuals, placards, and emergency and management plans must be noted as required by MARPOL.

HOW DNV GL HELPS YOU

DNV GL supports ship owners to comply with the Polar Code and to obtain a Polar Ship Certificate. Our services include both statutory certification on behalf of the flag administration, and advisory services to help you prepare for certification. The advisory and certification services will always be conducted independently from each other according to the implementing acts.

We also help you through our traditional ship classification services, offering a suite of notations to meet your cold-climate operating needs:

- Ice strengthening – via the PC polar ice classes, from PC(1) to PC(7), and the Baltic ice classes, ICE(1A*) to ICE(1C)
- Icebreaker notation – for ships specially designed to break ice
- Winterization – the protection of ship systems from freezing and icing via our Winterized notations

We will help you to select an appropriate ice class, design temperature, polar service temperature, and winterization notation to best suit your planned polar operations. A summary of our services is provided in the overview on the right page.

POLAR CODE SERVICES FROM DNV GL

Step	Requirements	Polar Code reference	Statutory certification services (required)	Advisory services (optional)
1	Operational assessment report	Part I-A § 1.5	Review the owner's operational assessment	Assists owners in conducting the operational assessment, define the ship's polar operations capabilities, and set a Polar Service Temperature
2	Determination of polar ship category equivalency	Part I-A § 3	Review/approve the ice class equivalency (for non-IACS polar ice class ship seeking Category A or B designation)	Assist owners in conducting a structural equivalency analysis of an existing ship to determine its equivalent polar ship category
3	Documentation of systems and equipment	Part I-A § 1.5	Review/approve the ship system and equipment documentation	Assist owners in assessing the ship's systems and equipment against the requirements of the Polar Code and identify what documentation will be needed
4	Intact stability calculations that include allowance for icing	Part I-A § 4.3.1	Review/approve stability calculations	Calculate the icing load and stability calculations for relevant loading conditions
5	Polar Water Operational Manual (PWOM)	Part I-A § 2	Review the PWOM	Assist owner in preparing the PWOM, customized to the needs of each ship
6	Ship survey to confirm compliance with Polar Code	Part I-A § 1.5	Conduct the statutory survey*	
7	Issuance of Polar Ship Certificate (PSC)	Part I-A § 1.5	Issue the PSC on behalf of the vessel's flag administration	
8	MARPOL certificates	Part II-A § 1	Reissues the appendix to the IOPP certificate to indicate compliance with the environmental requirements of the Polar Code. Other MARPOL certificates are unaffected.	

*Usually harmonized with the renewal or intermediate survey of the vessel's other SOLAS certificates

CONTACT (FOR ALL SERVICES)

For customers:
DATE – Direct Access to Technical Experts, via *My DNV GL*

Others:
Send email to PolarCode@dnvgl.com

HOW DOES THE CODE APPLY TO MY SHIP?

The Polar Code is a functional, goal-based code. It applies to ships differently, depending on how a ship is constructed and how it will be operated in polar waters.

Fit for purpose?
A key objective of the Polar Code is to ensure a ship is fit for its intended operation in polar waters. The Code does not provide a one-size-fits-all solution. The Code's requirements derive from the capabilities a ship will need to have to carry out its intended operations safely and responsibly. This is highly dependent on where, when and how it will operate in the polar regions and what environmental conditions it will likely encounter while there.

Polar operating profile
The first step in understanding how the Code applies to your ship is to define its polar operating profile. This includes where the ship is intended to operate, what seasons it will operate there and what type of activities the ship will conduct.

Ideally, the profile is tailored to reflect the ship's known or planned range of operations in the polar regions. If this isn't known, then a generic operating profile can be formulated instead.

Operational risk assessment
Next, you need to conduct the operational assessment required by the Polar Code (Part I-A § 1.5).

It is a type of risk assessment that
- defines the anticipated range of operating and environmental conditions for the area and season of operations,
- identifies the relevant hazards associated with the ship's polar operating profile,
- identifies the capabilities the ship requires to perform satisfactorily under these conditions,
- assesses the ship's design and equipment arrangement against these capabilities, and
- identifies additional technical and operational measures needed to comply with the Polar Code.

Certain key choices in a ship's polar operating profile and key conclusions from the operational assessment will determine which parts of the Polar Code apply to your vessel. These are:
- operation in ice,
- operation in low air temperature,
- operation in high latitude, and
- maximum expected time of rescue.

Operation in ice
The Polar Code assigns a ship to one of three categories – Category A, B or C – based on the type of ice for which it is designed to operate, if any. A ship's category determines the applicability of some requirements and regulations in the Code, as some apply to a Category A ship only, others to Category A and B ships for example.

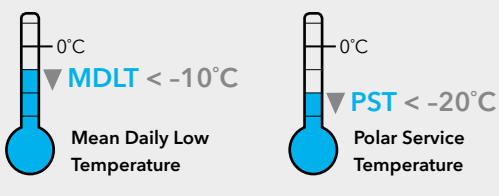
A ship's ice class is used to determine its polar ship category (see page 13). The Polar Code does not associate a ship's category with geographic operating areas. Rather, a ship owner should ensure that the ship's ice class is appropriate for the anticipated ice conditions and operate it within those limits.

Operation in low air temperature
Low air temperature adversely affects human and equipment performance, survival time and material properties.

The Polar Code divides ships into two categories with respect to air temperature: those intended to operate in low air temperature, and those which are not.

A *ship intended to operate in low air temperature* means a ship intended to undertake voyages to or through areas where the lowest Mean Daily Low Temperature (MDLT) is colder than –10°C. For such a ship, a *Polar Service Temperature (PST)* shall be specified and shall be at least 10°C colder than the lowest MDLT for the intended area and season of operation in polar waters (see page 12 for an explanation of the lowest MDLT and PST.)

The Polar Code contains specific requirements for a ship intended to operate in low air temperature. These include general requirements that systems and equipment required by the Code must be fully functional at the PST. Survival systems and equip-



ment also must be fully operational at the PST during the maximum expected time of rescue.

Operation in high latitude
Operating in high latitudes limits the performance and availability of standard navigation and communication systems, and may affect the quality of ice imagery information.

The Polar Code requires additional communications and navigation equipment for vessels proceeding to high latitudes.

Maximum expected time of rescue
Remoteness and the lack of infrastructure in the polar regions affects the availability and timeliness of rescue and assistance to ships in distress.

Ships operating in remote polar waters must be prepared to wait for some days before SAR resources arrive on scene.

The Polar Code requires a ship owner to determine the *maximum expected time of rescue* for their intended operations in polar waters. This determines the type and amount of survival equipment the ship must carry on board.

The Code requires that this must be at least five days. When operating in some remote areas, it may be considerably more than five days.

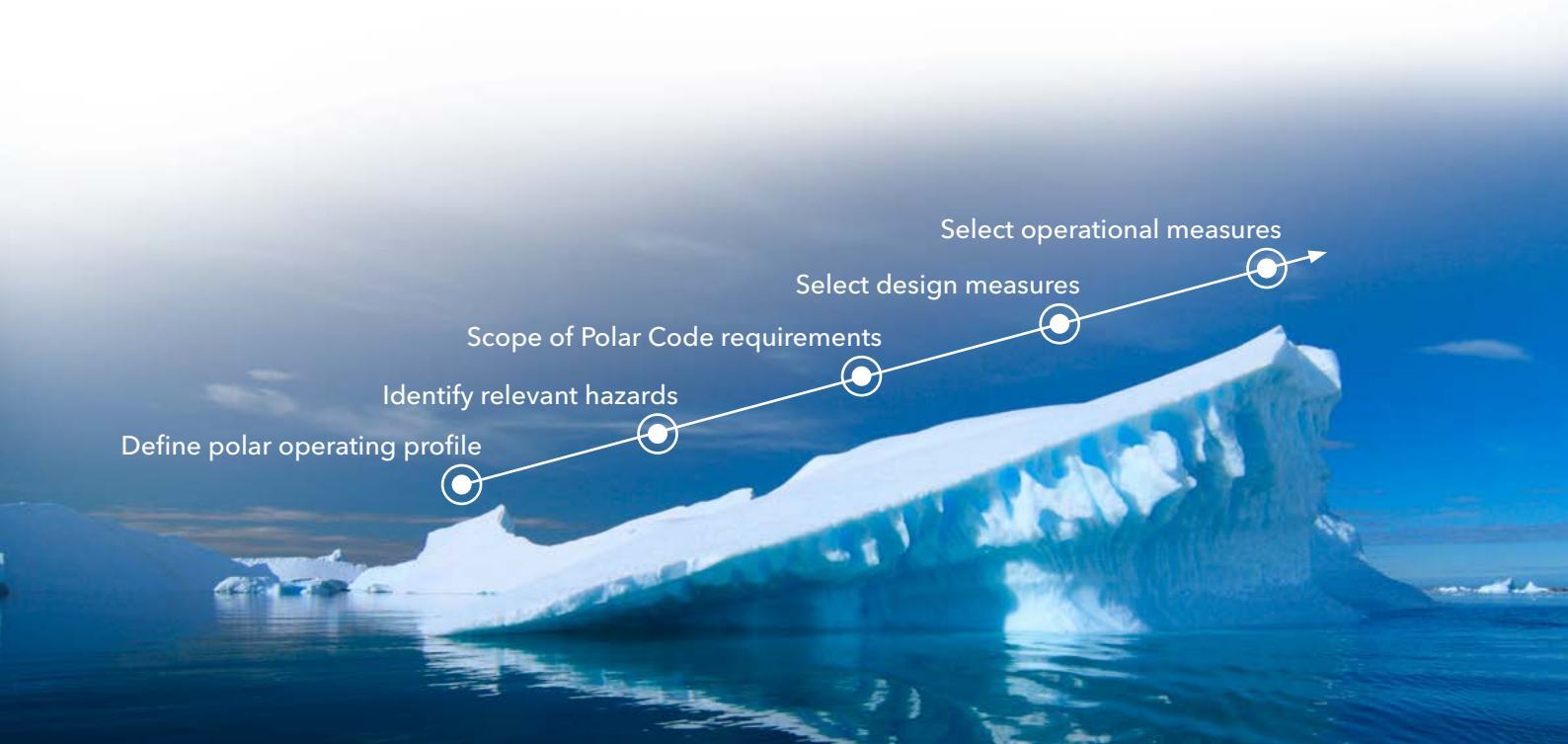
Setting this value for a ship is a key element of the operational risk assessment required by Part I-A § 1.5 of the Code.

Determining individual requirements
Once the polar operating profile and operational risk assessment have been performed for a ship, we can determine which requirements in the Polar Code apply to it.

Some requirements must be met by design measures and some by operational procedures. For others, the owner may choose either design or operational measures, or a combination of both, to comply.

There is no single prescribed solution for what is considered "acceptable" in meeting many of the functional requirements of the Code. In this way, the Polar Code is similar in approach to the International Safety Management (ISM) Code and the International Ship & Port Facility Security (ISPS) Code, which rely heavily on the owner/operator to develop processes that adequately address a ship and operation.

DNV GL is ready to assist you in this process. We can help you define a polar operating profile, conduct the operational assessment, determine which parts of the Code apply to your ship, and evaluate alternative design and operational measures to comply with them.



OPERATION IN LOW AIR TEMPERATURE

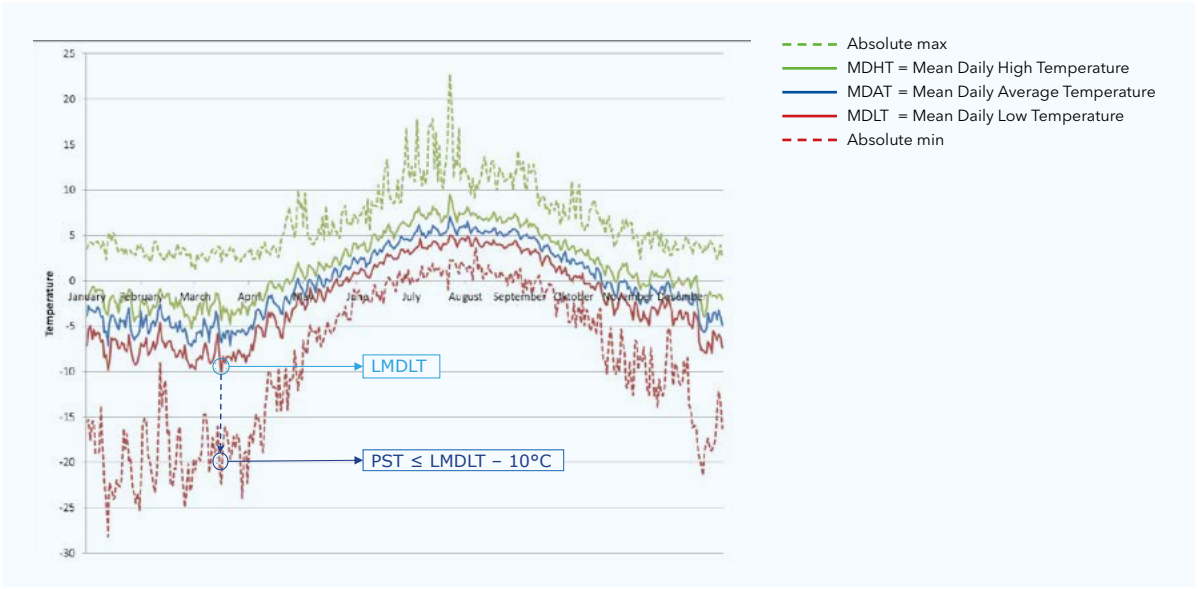
A ship intended to operate in low air temperature means a ship intended to undertake voyages to or through areas where the lowest Mean Daily Low Temperature (MDLT) is colder than –10°C.

The lowest MDLT means the mean value of the daily low temperature for each day of the year over a period of at least ten years. To calculate it:

1. Determine the daily low temperature for each day over a ten-year period in the intended area of operation in polar waters.
2. Determine the average of the values over the ten-year period for each day.
3. Plot the daily averages over the year.
4. Take the lowest of the averages for the season of operation. This is the lowest MDLT.

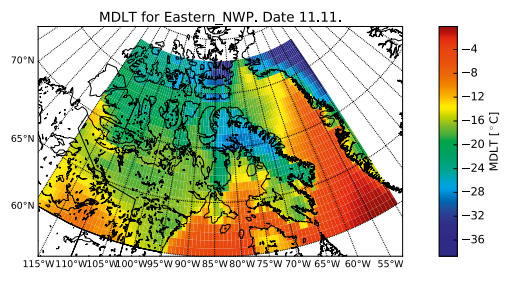
If the lowest MDLT is colder than –10°C, then a Polar Service Temperature (PST) shall be specified. The PST must be set at least 10°C colder than the lowest MDLT for the intended area and season of operation in polar waters.

Example:
If the lowest MDLT is –15°C, then the PST equals –25°C.



How to find LMDLT and PST: an example using temperature statistics from the Barents Sea

Tip!
DNV GL will help you determine the lowest MDLT for your planned area and season of operation in polar waters. Just tell us where you want to go and when you want to go there. We will prepare MDLT charts and calculate the lowest MDLT for you.



POLAR SHIP CATEGORIES

The Polar Code divides ships into three categories: Category A, B or C.

		ICE CLASS	OPERATING CAPABILITY
A	**Category A** ship means a ship designed for operation in polar waters in at least medium first-year ice, which may include old ice inclusions. This corresponds to vessels built to the IACS Polar ice classes PC1 to PC5.	PC1	Year-round operation in all polar waters
		PC2	Year-round operation in moderate multi-year ice
		PC3	Year-round operation in second-year ice, which may include multi-year inclusions
		PC4	Year-round operation in thick first-year ice, which may include old ice inclusions
		PC5	Year-round operation in medium first-year ice, which may include old ice inclusions
B	**Category B** ship means a ship not included in Category A, designed for operation in polar waters in at least thin first-year ice, which may include old ice inclusions. This corresponds to vessels built to the IACS Polar ice classes PC6 and PC7.	PC6	Summer/autumn operation in medium first-year ice, which may include old ice inclusions
		PC7	Summer/autumn operation in thin first-year ice, which may include old ice inclusions
C	**Category C** ship means a ship designed to operate in open water or in ice conditions less severe than those included in Categories A and B. This corresponds to ships of any Baltic ice class or with no ice strengthening at all. Vessels with other ice class notations must be evaluated on a case-by-case basis to determine their equivalent polar ship category (for example, the legacy DNV icebreaker ice classes ICE-05, 10 or 15 and POLAR-10, 20 or 30).	ICE-1A* / E4	First-year ice to 1.0 m
		ICE-1A / E3	First-year ice to 0.8 m
		ICE-1B / E2	First-year ice to 0.6 m
		ICE-1C / E1	First-year ice to 0.4 m
		ICE-C / E	Light ice conditions
		None	Ice-free/open water conditions

POLAR CODE PART I – SAFETY

This part of the brochure reviews each of the Polar Code's technical chapters addressing ship safety found in Part I of the Code. It provides an overview of the requirements and gives some practical interpretations.

CHAPTER 3 – SHIP STRUCTURE

This chapter addresses ship structural materials and scantlings. It seeks to ensure they retain structural integrity when subjected to low temperatures and ice loads.

It sets two basic requirements:
- The ship is to be built with materials suitable for the Polar Service Temperature (PST).
- For ice-strengthened ships, the structure is to be designed to resist both global and local structural loads corresponding to the foreseen ice conditions.

The Polar Code does not require a vessel to be ice-strengthened. However, a vessel's level of ice strengthening will determine its capabilities and limitations for navigating in ice, which will be noted on its Polar Ship Certificate. The master is responsible for operating the ship within these limitations.

The Polar Code divides ships into three categories: Category A, B or C (see page 13).
- Category A and B ships are built and ice-strengthened in accordance with the IACS Polar ice classes, or to a standard offering an equivalent level of safety.
- All other ships belong to Category C. This includes vessels with a Baltic ice class or without ice strengthening.

Vessels with other ice class notations may be evaluated on a case-by-case basis to determine their equivalent polar ship category (for example, the legacy DNV icebreaker ice classes ICE-05, 10 or 15 and POLAR-10, 20 or 30).

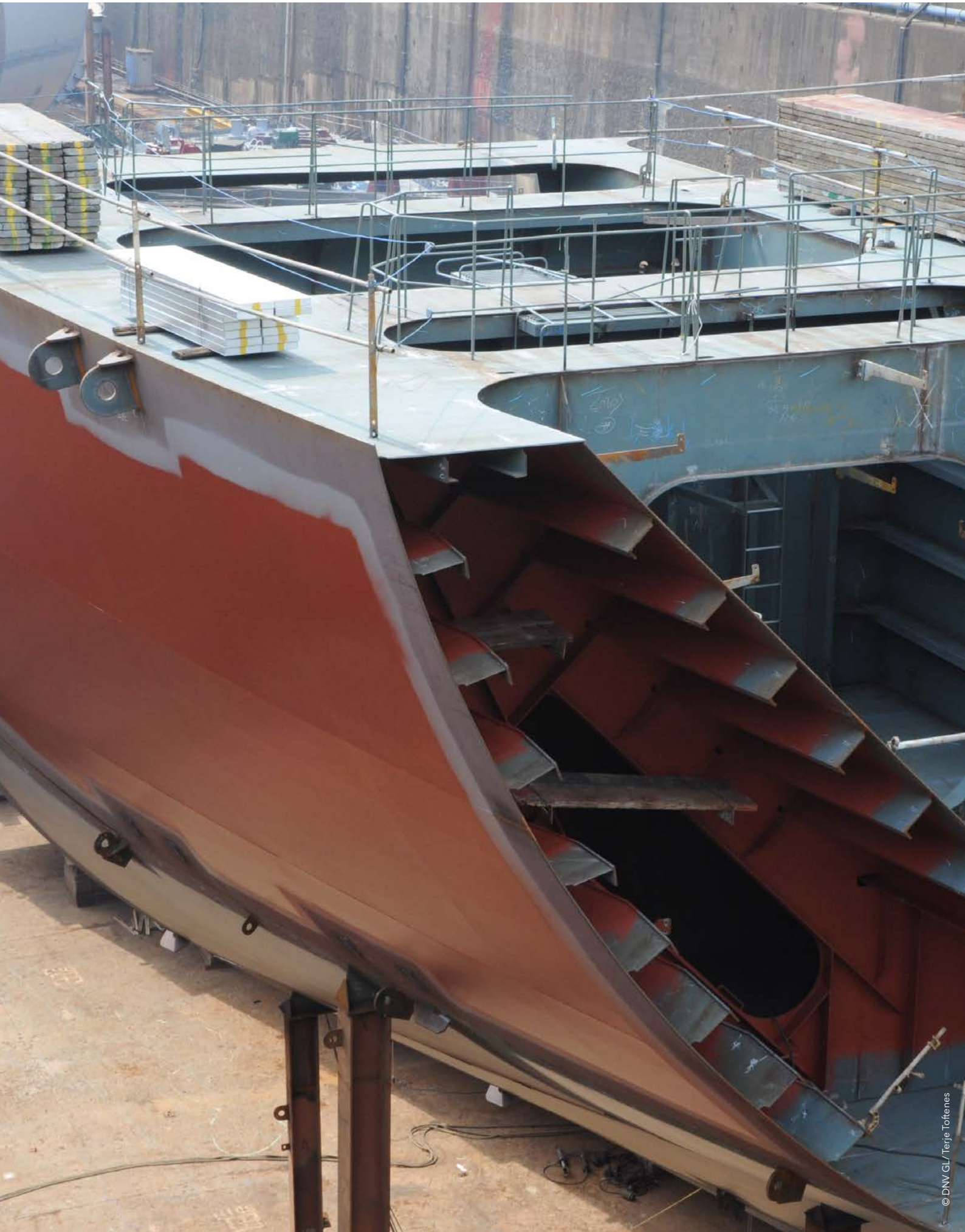
Ship structure technical requirements
The technical requirements for the Polar ice classes PC1 to PC7 can be found in the DNV GL Rules for Classification of Ships (DNVGL-RU-SHIP) Part 6, Chapter 6, Section 5.

Category A and B ships with an ice class PC1 to PC7 shall comply with the material requirements of their ice class. The design temperature **t** (the reference temperature used as a criterion for the selection of steel grades) shall be ≤ PST + 13°C.

Category C ships in DNV GL class with a PST < –32°C must have the additional class notation **DAT(t)**, described in DNVGL-RU-SHIP Part 6, Chapter 6, Section 4. The design temperature **t** shall be ≤ PST + 13°C.

Category C ships in DNV GL class with a PST ≥ –32°C do not require the **DAT(t)** notation as the main class material requirements found in DNVGL-RU-SHIP Part 3, Chapter 3, Section 1, Table 9 are sufficient.

Ship structure assistance
Contact DNV GL if you need technical assistance to
- select an appropriate ice class, design temperature and polar service temperature; or
- perform a structural analysis of an existing ship, determine its equivalent polar ship category and obtain a statement of equivalency.



CHAPTER 4 – SUBDIVISION AND STABILITY

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

It has two principal requirements:

- All ships must have sufficient stability in intact conditions when subject to ice accretion
- That new Category A and B ships must have sufficient residual stability to sustain ice-related damage

Stability technical requirements

To fulfil the intact stability requirement, the Code requires that an allowance for icing be made in the ship's stability calculations and that this allowance is described in the ship's Polar Water Operational Manual (PWOM). Furthermore, the ship must have effective means to prevent or remove snow and ice accumulation such that it does not exceed the values given in the PWOM.

The Code prescribes a minimum icing load of 30 kg/m^2 on exposed weather decks and gangways, 7.5 kg/m^2 for the projected lateral area of each side of the ship above the water plane, and an additional allowance for the projected lateral area of discontinuous surfaces and small objects as given in Part I-A § 4.3.1.

To fulfil the damage stability requirement, new Category A and B ships must have sufficient residual stability to withstand flooding from a hull penetration caused by ice impact. The specific size of the damage and locations where it shall be applied are given in Part I-A § 4.3.2 of the Code.

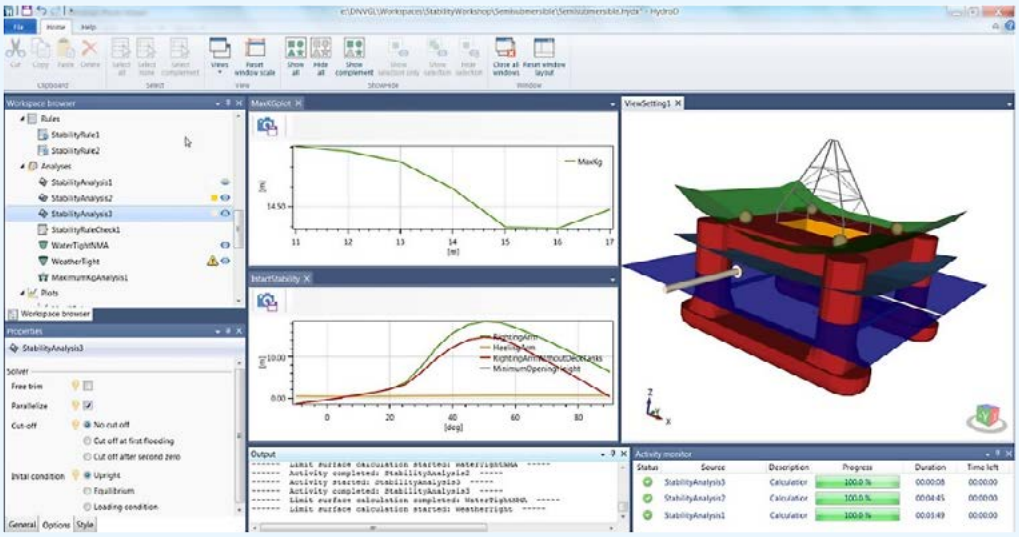
Technical interpretations

Any operational loading condition shall have sufficient stability to comply with the intact stability criteria and the GM limit curve covering damage stability requirements, regardless of area of operation. Consequently, the ship must be designed to be able to operate within the limits of the damage stability limit curve also when the additional weight from ice accretion is taken into account.

Documentation requirements

For all ships – intact stability calculations that include allowance for icing in accordance with § 4.3.1 and a description of this allowance in the ship's Polar Water Operational Manual.

For new Category A and B ships – damage stability calculation in accordance with § 4.3.2.



Sesam HydroD intact stability calculation with icing loads

CHAPTER 5 – WATERTIGHT AND WEATHERTIGHT INTEGRITY

The goal of this chapter is to ensure a ship can maintain its water- and weather-tight integrity while in a polar environment. It has three requirements.

For all ships

- The ship shall have effective means for preventing or removing ice and snow accumulation around hatches and doors.

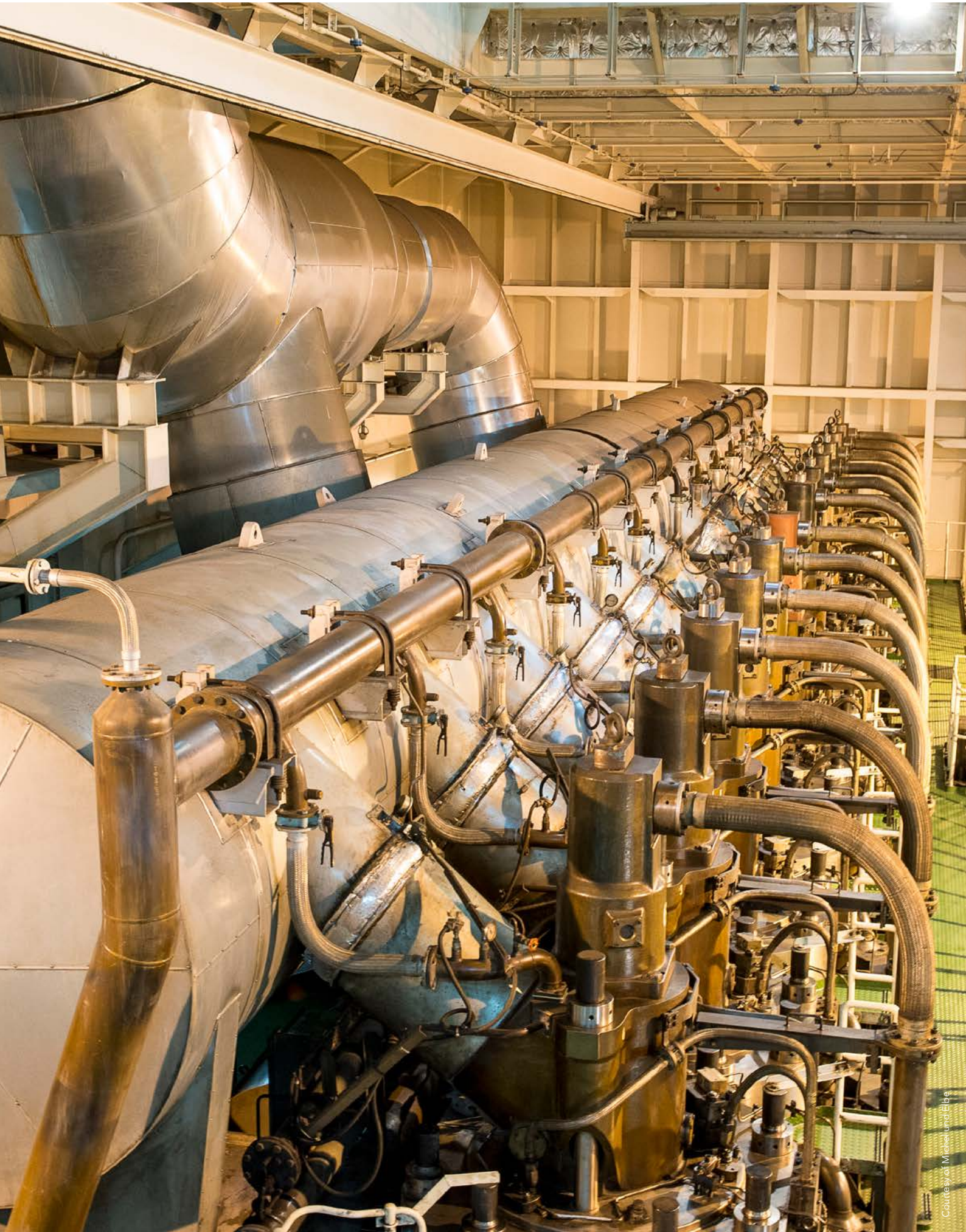
For ships intended to operate in low air temperature

- Means shall be provided to prevent freezing or excessive viscosity of liquids to hydraulically operated hatches and doors.
- Outside hatches and doors shall be designed to be operated by personnel wearing heavy winter clothing including thick mittens. In practice, this means door handles and operating controls must be large enough to allow operation without requiring the operator to remove their mittens.

Technical interpretations

For hydraulically operated hatches and doors, the hydraulic oil viscosity must remain within the range defined in the manufacturer's equipment specification.

Hydraulic fluid may either be of a type that maintains an acceptable viscosity to the Polar Service Temperature, or the hydraulic system may have heating/circulation arrangements to keep fluids at an appropriate temperature to maintain an acceptable viscosity.



Courtesy of Meyer und Hoe

CHAPTER 6 – MACHINERY INSTALLATIONS

The goal of this chapter is to ensure a ship's essential machinery systems maintain the functions necessary for safety when operating in a polar environment. Its requirements are divided into three groups: those for all ships, those for ships intended for operations in cold air temperature, and those for ships with ice strengthening.

For all ships, essential machinery installations shall be protected from the adverse effects of

- ice and snow accumulation,
- ice ingestion at seawater inlets,
- snow ingestion at ventilation intakes,
- seawater intake temperature, and
- freezing and increased viscosity of liquids, gases and other essential substances.

For ships intended to operate in low air temperatures, exposed essential machinery shall function at the ship's Polar Service Temperature (PST). Essential machinery installations shall also consider

- the effects of cold and dense inlet air,
- loss of performance of batteries or other stored-energy devices, and
- materials for exposed machinery and their foundations, which shall be suitable for the PST.

For ice-strengthened ships, essential machinery installations shall also consider loads imposed directly by the ship's interaction with ice.

Technical interpretations

Essential machinery means an item associated with maintaining the main functions of a vessel in the context of class as defined in DNVGL-RU-SHIP Part 1, Chapter 1, Section 1 (power generation, propulsion, steering, drainage and bilge pumping, ballasting, anchoring).

Exposed machinery means an item located outside or in an unheated compartment such that it is subjected to freezing air temperature.

For all ships

- Machinery is best protected from the polar environment by placing it in a heated enclosure or compartment wherever practicable.
- Seawater supplies shall be designed to prevent ingestion of and blockage by ice, or otherwise arranged to ensure functionality. Ships built to DNV GL ice class rules have this protection.
- Ventilation intakes shall be provided suitable anti-icing protection, located on both sides of the ship, or accessible for manual de-icing.
- Working liquids should either be suitable for the PST or kept at the proper temperature through heating, circulation or chemical additives.

For ships intended to operate in cold air temperature

- Evidence of functioning and material suitability at the PST is required for exposed essential machinery. Acceptance may be established by manufacturer's work certificate or by test.
- For essential machinery driven by internal combustion engine, the machinery must be able to start and operate with combustion air at the PST, or means must be provided to preheat it.
- Batteries for essential machinery shall be protected from cold air temperatures by placing them in a heated compartment or battery box.
- The supply of compressed air to exposed essential machinery shall be provided with air drying sufficient to lower the dew point to colder than the PST at actual pressure.
- Materials of exposed machinery foundations shall be chosen in the same manner as the ship's structural materials.
- Metallic materials of exposed machinery shall comply with DNVGL-RU-SHIP Part 6, Chapter 6, Section 3, Table 7, Item 1001. The design temperature td used to determine compliance shall be ≤ PST + 13°C. (e.g., if PST is –30°C, then td ≤ –17°C). Evidence of compliance may be established by manufacturer's work certificate.

For ice-strengthened ships

- For a ship built to DNV GL ice class rules, the scantlings of propeller blades, propulsion line, steering equipment and other appendages are designed to function in the ship's design ice condition.

CHAPTER 7 – FIRE SAFETY AND PROTECTION

The goal of this chapter is to ensure that fire-fighting systems and appliances remain operable and effective under polar environmental conditions.

This chapter sets requirements for all ships and additional requirements for ships intended to operate in low air temperature.

For all ships

- Fire-fighting equipment and system components (including hydrants, hoses, nozzles, monitors, controls, isolating valves, pressure/vacuum valves, etc.) shall always be accessible and be protected from freezing, snow and icing.
- Fire mains and fire-fighting system piping shall be protected from freezing and arranged so that exposed sections can be isolated and drained.
- Fire pumps shall be in heated compartments, and sea suctions serving them shall be arranged to allow the clearing of ice accumulation.
- Extinguishing media shall be suitable for the intended operating environment.
- Fire-fighting accesses shall be provided anti-icing or de-icing protection.

For ships intended to operate in low air temperature

- All fire safety systems and appliances shall be fully functional at the Polar Service Temperature (PST).
- Exposed fire safety system components shall be made of materials suitable for the PST.
- All two-way portable radio communication equipment shall be operable at the PST.
- Fire extinguishers shall be protected from freezing or certified for operation to the PST.

Technical interpretations

Exposed means an item located outside or in an unheated compartment such that it is subjected to freezing air temperature.

Fire mains and fire-fighting system piping may be protected from freezing by arranging them as a dry, self-draining system, by locating them in a heated passageway or compartment, or by providing them with heat tracing and insulation.

- Where arranged as a dry, self-draining system, drains shall be located at the lowest points in the system, and the piping layout shall ensure all water will drain to them without being trapped in bends, low points or dead-ends.
- Where heat tracing and insulation are used, they shall be effective at preventing freezing to –20°C or the PST, whichever is colder.

Fire-fighting equipment in locations exposed to icing or snow shall have anti-icing protection. Ideally the hydrant, hose and nozzle should all be protected inside a hose box, preferably heated. Fire-fighting monitors, controls, isolation valves, etc. can be protected from icing with canvas or other soft cover.

Fire extinguishing agents (foams, powders, gases) stored or intended for use in exposed locations shall be rated for storage/use at –20°C or the PST, whichever is colder.

Ideally, extinguishers should be located inside a heated deckhouse or cabinet to protect them from freezing and external icing. If stored in an exposed location, extinguishers shall be rated for storage and use at –20°C or the PST, whichever is colder.

Flame, smoke and gas detectors in exposed locations shall be rated for use at –20°C or the PST, whichever is colder. Detectors shall be protected from icing and snow by their design or placement.

Sea suctions to all fire pumps shall be arranged with steam injection to facilitate clearing of ice accumulation.

Metallic materials of exposed fire safety system components shall comply with DNVGL-RU-SHIP Part 6, Chapter 6, Section 3, Table 7, Item C1001. The design temperature td used to determine compliance shall be ≤ PST + 13°C. Evidence of compliance may be established by manufacturer's work certificate.

Portable radio communications equipment shall be tested and certified for proper operation at –20°C or the PST, whichever is colder. Test procedures found in IEC 60945 may be adopted, using the vessel's PST as the test temperature.

Pressure relief and pressure/vacuum valves exposed to icing or freezing temperatures shall have anti-icing/anti-freezing protection that complies with DNVGL-RU-SHIP Part 6, Chapter 6, Section 3, Table 7, Items C530 and C809, as appropriate.

CHAPTER 8 – LIFE-SAVING APPLIANCES AND ARRANGEMENTS

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

This chapter sets requirements for all ships, with additional requirements for new ships and ships intended to operate in extended periods of darkness.

To ensure safe and immediate **escape**

- All ships must have means to prevent or remove ice and snow from escape routes, muster and embarkation areas, survival craft and their launching appliances.
- New ships must arrange escape routes so as not to hinder passage by persons wearing polar clothing.

To ensure safe **evacuation** off the ship

- All ships must have the means to safely evacuate people and deploy survival craft and equipment when operating in ice-covered waters.
- All ships must be able to operate life-saving appliances independently of the ship's main source of power.

To enable **survival** after abandoning ship

- All ships shall provide adequate resources to support survival after abandoning ship, whether to sea, to ice or to land, for the maximum expected time of rescue. These resources shall provide a ventilated environment that will protect against hypothermia, sufficient food and water to sustain life, and the ability to communicate with rescue assets.
- Everyone aboard shall be provided thermal protection and personal survival equipment that adequately maintains core body temperature and prevents frostbite of extremities.
- Survival craft and group survival equipment shall provide effective protection against direct wind chill for all persons aboard.
- Lifeboats must be partially or totally enclosed.
- Group survival equipment is required if there is a potential for abandonment onto the ice or to land.
- Where required, personal and group survival equipment will be provided for 110% of the persons aboard, stowed in easily accessible locations in or near the survival craft.
- Containers for group survival equipment shall be floatable and easily movable over the ice.
- For ships operating in extended periods of darkness, lifeboats shall be equipped with searchlights for detecting and identifying ice.

Technical interpretations

For escape routes on new ships, an unobstructed width of not less than 900 mm may be considered sufficient to ensure unhindered passage by persons wearing polar clothing.

Free-fall lifeboats cannot be safely launched in free-fall mode in ice-infested waters. Ships must be arranged with an alternative lowering mechanism and adequate means for the crew to safely access the lifeboat.

Survival systems that use ship's power (such as launching appliances) shall be arranged from the emergency switchboard.

Life rafts are inferior to lifeboats for supporting survival in a polar environment. Where a ship's lifeboat capacity is insufficient for the entire complement, those personnel designated for evacuation in life rafts must be provided thermally insulated immersion suits.

Life-saving appliances must be fully operational at the PST during the maximum expected time of rescue (see explanation on page 11).

- The standard IMO test criteria for life-saving appliances is –30°C in stowage and –15°C in operation. As the PST may be colder than these temperatures, additional testing or qualification may be required.
- The standard IMO lifeboat engine starting test is –15°C. If the PST is colder, then the engine may either be tested to the PST, or the lifeboat may be heated sufficiently to ensure the inside temperature is ≥ –15°C when the outside temperature is at PST.

Containers for group survival equipment shall be designed such that two people can lift them from the water up onto an ice floe (a vertical distance of approx. 0.5 metres). Container weight should not exceed 25 kg.

CHAPTER 9 – SAFETY OF NAVIGATION

The goal of this chapter is to provide for safe navigation in different polar environmental conditions, including when operating in ice, darkness, high latitudes or with icebreaker escort.

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

All ships operating in polar waters must have means to receive up-to-date nautical and ice information and the ability to visually detect ice. The Code requires all ships to have:

- the means of receiving and displaying information on ice conditions in its area of operation;
- a clear view astern; and
- two remotely rotatable, narrow-beam search lights controllable from the bridge to visually detect ice.

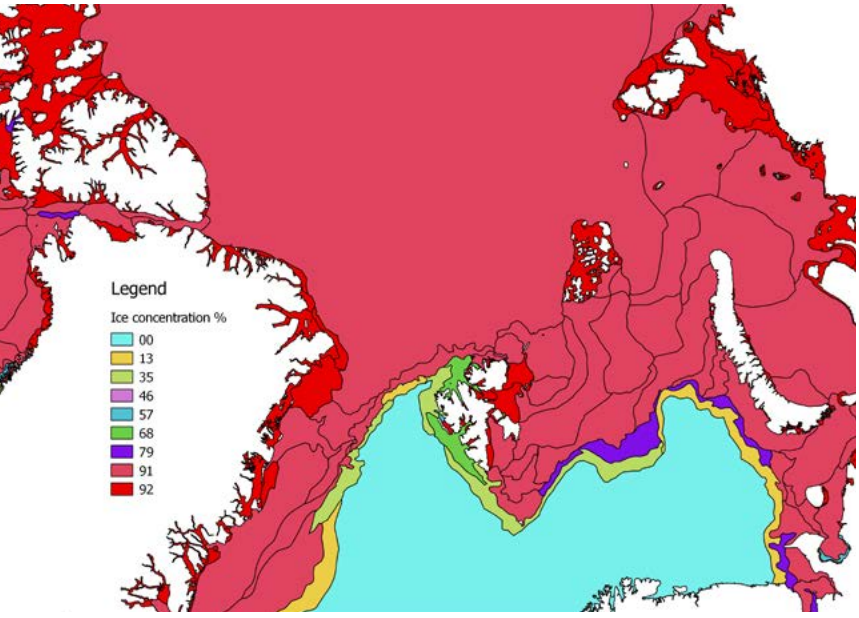
To ensure safe navigation under polar environmental conditions:

- All ships shall have means to prevent the accumulation of ice on antennas required for navigation and communication.
- All ships shall have two non-magnetic means to determine and display their heading. Both means shall be independent and shall be connected to the ship's main and emergency source of power.
- Ships operating in high latitudes (over 80°) shall be fitted with at least one GNSS compass or equivalent, which shall be connected to the ship's main and emergency source of power.
- New ice-strengthened ships shall have either two independent echo-sounding devices or one echo-sounding device with two separate, independent transducers.
- New Category A and B ships shall have enclosed bridge wings to protect navigation equipment and personnel.

When operating in a convoy, a ship must be able to indicate when it is stopped to avoid being overrun by a following vessel.

- Ships involved in operations with an icebreaker escort must be equipped with a manually controlled flashing red light visible from astern to indicate when the ship is stopped.
- This light shall have a range of visibility of at least two nautical miles, with the same arcs of visibility as a stern light.

Technical interpretations
All required navigation equipment must be fully functional at the PST. Fixed navigational units/subunits (such as magnetic compass, GPS antennae, Radar antennae) meant for use in exposed environment (open deck) are already tested to –25°C based on IEC 60945. Where the PST is colder, additional testing or qualification may be required. Where a vessel's bridge configuration does not provide a clear view astern, an approved camera arrangement mounted astern with a display of the navigation bridge may be considered an alternative solution.



Ice chart of the Barents and Kara Seas

CHAPTER 10 – COMMUNICATIONS

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

This chapter contains three groups of requirements.

For all ships, the Polar Code requires equipment intended for:

- Ship-to-shore voice and/or data communications
- Telemedical assistance services, and for receiving ice and meteorological information
- Ship-to-ship voice and/or data communications
- Both maritime and aeronautical two-way voice on-scene and search and rescue coordination communications

The limitations of communications systems in high latitudes and the anticipated low temperature that is available at all points along the intended operating routes must be considered for the above systems.

For ships intended to operate in low air temperature:
The Polar Code requires additional communications equipment for survival craft.

Rescue boats and lifeboats, when released for evacuation, shall each carry:

- A device for transmitting ship-to-shore alerts. This could be complied with by a dedicated manual EPIRB for all rescue boats and lifeboats (in addition to the EPIRBs required by SOLAS Ch. IV).
- A device for transmitting signals for location, such as SART or AIS-SART for all rescue boats and lifeboats. Compliance with this requirement implies compliance with SOLAS Regs. III/6.2.2 and IV/7.1.3.
- On-scene radio communication device such as dedicated two-way VHF apparatuses for all rescue boats and lifeboats. These apparatuses can also be used for compliance with SOLAS Regs. III/6.2.1 and IV/4 if clearly addressed in written procedures.

Life rafts shall each carry:

- A device for transmitting signals for location, such as dedicated SART or AIS-SART for all rafts.
- On-scene radio communication device such as dedicated two-way VHF apparatuses for all rafts.

Icebreakers that provide escort services shall have a sound signalling system (horn) that faces astern to indicate manoeuvres to following ships.

Technical interpretations
When planning the vessel's communication systems, high latitude limitations need to be considered.

Most areas of the polar regions are defined as GMDSS Sea Area A4. However, there are sea areas in the polar regions which have A1, A2 or A3 coverage (see Annex 5 of the GMDSS Manual, 2015 edition, for additional details).

All ships in international trade, regardless if operational sea area, shall comply with SOLAS Ch. IV or HSC Ch. 14. This means that the functional requirements of ship-to-shore, ship-to ship and SAR communications (Polar Code Ch. 10.2.1.1 and 10.2.1.3) are covered by SOLAS Ch. IV or HSC Ch. 14. (See the sea area definitions below for mandatory fixed equipment in each sea area).

GMDSS sea areas are defined as follows:
A1: Within coverage of a shore VHF/DSC station (required fixed equipment on board: one VHF/DSC).
A2: Within coverage of a shore MF/DSC station (required fixed equipment on board: one VHF/DSC and one MF/DSC).
A3: Areas where GMDSS Inmarsat coverage is available. In future, this will be changed to areas where coverage from an approved GMDSS satellite provider is available. Fixed equipment on board is required:

- Two VHF/DSC, one MF/DSC and two approved GMDSS Inmarsat ship earth station (SES) such as Inmarsat C or mini C
- Or two VHF/DSC, one approved GMDSS Inmarsat SES and one MF/HF/DSC/NBDP Tlx

Note: The Inmarsat coverage in polar regions varies depending on the location. Ships operating above 65°N or bellow 60°S may not experience coverage by Inmarsat and hence may need compliance with A4 requirements unless within coverage of A1 or A2.
A4: Sea areas Outside A1, A2 and A3 (required fixed equipment: two VHF/DSC + two sets of MF/HF/DSC/NBDP).

Non-GMDSS systems, such as Iridium, may be available and can be effective for voice and data communication in polar waters. These systems may be applied for compliance with Telemedical requirements when accepted by the authorities, or as supplementary equipment to the mandatory GMDSS systems. However, such systems are currently not approved for distress and safety communication and hence are not confirmed to comply with the GMDSS or Polar Code communication requirements other than Telemedical communication.

The effects of cold temperature on battery capacity for survival craft communication systems must be considered to ensure that they can remain available for operation during the maximum expected time of rescue. Hence, procedures to preserve battery power must be developed and included in the PWOM.

For portable VHF equipment, additional sealed batteries or rechargeable batteries with approved charging arrangement in the appropriate lifeboat, rescue boat or raft may be used as part of such procedure.

All required communication equipment must be fully functional at the PST.

Fixed GMDSS equipment and subunits meant for use in exposed environments (open deck), such as the Inmarsat SES antennae and MF/HF tuner/antenna, are already tested to –25°C based on IEC 60945. Where the PST is colder, additional testing or qualification may be required for the fixed GMDSS units or subunits installed on open deck.

Portable GMDSS equipment (EPIRB, SART, AIS-SART and portable VHF) are tested to –20°C for operation and -30°C for storage based on IEC 60945. Where the PST is colder, portable equipment should be kept in a warm environment, or additional testing/qualification may be required which should be included in the PWOM.

The SART/AIS-SART used in lifeboats, rescue boats and rafts should have provision for automatic activation with a battery capacity sufficient for 96 hours in standby and an additional 8 hours of continuous radar interrogation, as required by IMO Res. A.802(19)/2.2.

The PWOM should include procedures for rational use of SAR/AIS-SART and manual EPIRBs to prevent unnecessary activation of several units at the same time (see Polar Code Part I-A.11.2).

Tip!
As the code is quite new, technical interpretations might be enhanced or extended. For updated information, please visit our website at www.dnvgl.com/polar.

POLAR WATER OPERATIONAL MANUAL

The Polar Code requires SOLAS ships operating in polar waters to carry a Polar Water Operational Manual (PWOM). The Manual provides ship-specific guidance on how to safely operate the vessel within its design capabilities and limitations.

What is the purpose of the PWOM?
The Polar Water Operational Manual (PWOM) is a ship-specific reference document that describes in detail how the ship shall be operated in polar waters. The procedures address operations under both normal and emergency conditions.

If you operate a SOLAS-certified ship in polar waters, then you must have a PWOM and it must be carried aboard the ship.

The goal of the PWOM is to inform the master and crew about the ship's capabilities, limitations and essential operating procedures when in polar waters. It is intended to help them take sound operational decisions and actions to protect the ship, its crew and passengers, and the polar environment.

What shall be in the Manual?
The Manual must address each hazard identified as relevant in the ship's Polar Code operational risk assessment. This might include sea ice, cold temperatures, topside icing and high latitudes.

Where equipment is used to mitigate a hazard, the PWOM must explain how to operate it. Where procedures are used, the PWOM must spell them out.

The Manual must include (or refer to) specific procedures that the crew shall follow under the following conditions:

- During normal operations, to avoid encountering conditions that exceed the ship's capabilities
- In the event the ship encounters conditions that exceed its capabilities and limitations
- In the event of an incident in polar waters
- When operating in ice, either independently or with an icebreaker escort (if ice-capable)

What types of procedures must it contain?
The requirements for the PWOM are found in Part I-A § 2 of the Polar Code. Among others, the PWOM must contain procedures for the following:

- Voyage planning in polar waters
- How to assess ice conditions and determine whether it is safe for the ship to proceed
- How to receive and use ice forecasts
- How to operate equipment and maintain system functions during freezing temperatures, topside icing and sea ice
- What to do if the ship encounters ice or cold temperatures that exceed its design capability
- What to do in case of an emergency, including how to contact emergency response providers

What does an approved Manual look like?
Many different types of ships operate in the polar regions. They differ widely in their design and ability to operate in ice and cold temperature. Some can operate year-round in multi-year ice, while others do not operate in ice at all.

Because the PWOM must be tailored to each ship, its arrangement and its intended operation, there is no single example or template for an acceptable Manual.

Appendix 2 to the Polar Code contains a model table of contents for a PWOM. This can be used as a beginning point in organizing a Manual for your ship.

Who is responsible for the Manual?
The owner is responsible for providing a PWOM. Ideally, the Manual should be prepared by those who best know the ship and its crew, its operations in polar waters, and the company's safety management system.

DNV GL can help you

DNV GL Maritime Advisory can assist owners in preparing a PWOM tailored to the needs of their ship and its intended operations.

MANNING AND TRAINING

The Polar Code sets mandatory requirements for manning and training of SOLAS ships operating in polar waters. The training requirements are limited to deck officers based on ship type and the ice conditions in which they operate.

People fit for purpose
Just as ships need to be suited for operating in polar waters, so must the crews that operate them.

The Polar Code requires companies to ensure that certain deck officers have completed special training and have adequate experience and competence to meet the unique challenges of sailing in Arctic and Antarctic waters.

The Polar Code sets training requirements based on ship type and the ice conditions in which they operate (see the table on the right page). No special training is required for ships operating solely in ice-free waters. Basic training is required for tankers and passenger ships in open waters – that is, waters with an ice concentration less than one-tenth. Advanced and basic training are required of ships operating in all other ice conditions.

Administrations may allow the use of other qualified individuals (such as ice pilots) to satisfy some of the training requirements, with some conditions. Their use, however, never relieves the master or officer of the navigational watch from their duties and obligations for the safety of the ship.

Certificate in basic and advanced training
Where the Polar Code requires basic or advanced training, the proposed amendments to the STCW will require the officer to hold a certificate in basic or advanced polar ship training. This must be renewed at least every five years for continued service.

The requirements for these certificates are shown in the table on the right page.

Who is responsible for what?
Ship owners are responsible for ensuring their crews are certified in accordance with the STCW when in polar waters.

Flag administrations are responsible for
- approving training courses,
- defining approved or equivalent seagoing service,
- determining that a seafarer meets the required standard of competence, and
- issuing a Certificate of Proficiency to seafarers.

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

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

Implementation timeline
The amendments to the STCW enter into force on 1 July 2018. Implementation of them includes a two-year transition period.

Ship owners and seafarers should contact their national maritime administration for information on how it is implementing the Polar Code training requirements and how to obtain the necessary certificates.

TRAINING REQUIREMENTS FOR SHIPS OPERATING IN POLAR WATERS

	TANKERS	PASSENGER SHIPS	OTHER SHIPS
In ice-free waters	None	None	None
In open waters (ice concentration less than 1/10)	Certificate in Basic Training for master, chief mate and officers in charge of a navigational watch	Certificate in Basic Training for master, chief mate and officers in charge of a navigational watch	None
In other ice-covered waters (ice concentration more than 1/10)	Certificate in Advanced Training for master and chief mate Certificate in Basic Training for officers in charge of a navigational watch	Certificate in Advanced Training for master and chief mate Certificate in Basic Training for officers in charge of a navigational watch	Certificate in Advanced Training for master and chief mate Certificate in Basic Training for officers in charge of a navigational watch

Certificate in Basic Training

for ships operating in polar waters

Complete an approved basic training course
Meet the standard of competence in the STCW Code, § A-V/4, paragraph 1

Certificate in Advanced Training

for ships operating in polar waters

Meet the requirements for a Certificate in Basic Training
Complete approved seagoing service
- on board a ship operating in polar waters or equivalent seagoing service,
- in the deck department at the management level or while performing watchkeeping duties in an operational level, and
- for a period of at least 2 months in total during the preceding 5 years

Complete an approved advanced training course
Meet the standard of competence in the STCW Code, § A-V/4, paragraph 2

POLAR CODE PART II – ENVIR

Part II of the Polar Code sets additional environmental protection requirements for ships that operate in Arctic or Antarctic waters. These requirements apply to all MARPOL-certified ships, even if they are otherwise exempt from Part I ship safety and crew training requirements.

When do the environmental protection requirements come into force?
The Polar Code Part II environmental protection requirements come into force on 1 January 2017 for all MARPOL ships, including fishing vessels, that operate in Arctic or Antarctic waters.

How does Part II affect my operations?
All MARPOL ships – including fishing vessels – must comply with certain environmental protection measures when they operate in Arctic or Antarctic waters:

- All discharge of oil is prohibited (i.e. through 15 ppm oily water separator).
- Sewage discharge is restricted near ice (more than 3 nautical miles for treated sewage and 12 nautical miles for untreated sewage).
- Discharge of untreated sewage from new Category A and B ships and new passenger ships of all categories is prohibited.
- Garbage discharge is restricted near land and ice (at least 12 nautical miles).
- Operation in polar waters shall be addressed in the relevant record books, manuals, placards, and emergency and management plans required by MARPOL Annexes I, II, IV and V.

Does my vessel need modifications?
Existing ships do not require structural modifications to comply with Part II of the Polar Code.

New Category A and B ships must have additional protection to fuel tanks, oil residue (sludge) tanks and oily bilge water holding tanks that hold more than 30 cubic meters. This includes:

- separation of tanks from the outer shell, and
- a double bottom of minimum 760 mm for oil and noxious liquid substances tanks.

ONMENTAL PROTECTION

New Category A and B ships, and new passenger ships of all categories, either require an approved sewage treatment plant or they must retain all sewage on board while in polar waters.

Does my vessel need any certificate?
Only if it is a new Category A or B ship. For a new Category A or B ship, an entry in the Supplement to the International Oil Pollution Prevention (IOPP) Certificate is required to certify that it complies with the additional structural requirements on tank protection in Part II-A § 1.2 of the Polar Code.

Since no structural modifications are required for existing ships or new Category C ships, no entries in their IOPP Certificate are required.

No other MARPOL certificates are affected by the Polar Code.

Important terms
Category A, B or C ships are explained on page 13.
An existing ship is one built before 1 January 2017.
A new ship is one built on or after 1 January 2017.

SPECIAL CASE: FISHING VESSELS

Does the Polar Code apply to fishing vessels?
Yes, at least partially.

Fishing vessels must comply with the environmental protection requirements in Part II of the Polar Code. These requirements apply to all MARPOL-certified ships that operate in polar waters.

Fishing vessels are exempt from the ship safety and crew training requirements in Part I of the Polar Code. Part I only applies to SOLAS-certified ships.

Does my fishing vessel need a Polar Ship Certificate?
No. Fishing vessels do not require a Polar Ship Certificate.

What should I do?
Fishing vessel owners should contact their national maritime authority for information on how the Polar Code will be applied to them and for instructions on what they need to do.

SAFER, SMARTER, GREENER

Regional Maritime offices

Americas
1400 Ravello Dr.
Katy, TX 77494
USA
Phone: +1 281 396 1000
houston.maritime@dnvgl.com

Greater China
1591 Hong Qiao Road
House No.9
200336 Shanghai, China
Phone: +86 21 3208 4518
marketing.rgc@dnvgl.com

North Europe
Johan Berentsens vei 109-111
Postbox 7400
5020 Bergen, Norway
Phone: +47 55943600
bergen.maritime@dnvgl.com

South East Europe & Middle East
5, Aitolikou Street
18545 Piraeus, Greece
Phone: +30 210 41 00 200
piraeus@dnvgl.com

Germany
Brooktorkai 18
20457 Hamburg, Germany
Phone: +49 40 361498786
region-germany.maritime
@dnvgl.com

Korea & Japan
18F Kyobo Bldg.
Jong-ro 1, Jongno-gu
110714 Seoul, South Korea
Phone: +82 2 734 7326/7
region.korea@dnvgl.com

South East Asia & India
16 Science Park Drive
118227 Singapore
Singapore
Phone: +65 65 0 837 50
sng.fis@dnvgl.com

West Europe & Africa
3 Cathedral Street
Palace House
London, SE1 9DE
United Kingdom
Phone: +44 207 357 6080
london.maritime@dnvgl.com

Contact

IMO Polar Code
For customers:
DATE – Direct Access to Technical Experts, via *My DNV GL*

Others:
Send email to
PolarCode@dnvgl.com

DNV GL – Maritime
Brooktorkai 18
20457 Hamburg, Germany
Phone: +49 40 36149 0
www.dnvgl.com/polar

DNV GL
Driven by our purpose of safeguarding life, property and the environment, DNV GL enables organizations to advance the safety and sustainability of their business. We provide classification and technical assurance along with software and independent expert advisory services to the maritime, oil & gas and energy industries.

We also provide certification services to customers across a wide range of industries. Combining leading technical and operational expertise, risk methodology and in-depth industry knowledge, we empower our customers' decisions and actions with trust and confidence. We continuously invest in research and collaborative innovation to provide customers and society with operational and technological foresight. With origins stretching back to 1864, DNV GL's reach today is global. Operating in more than 100 countries, our professionals are dedicated to helping customers make the world safer, smarter and greener.

Design: Maritime Communications ID: 1358343