

# Guidelines for fishing vessels in polar waters



These guidelines are for operators of fishing vessels of 24 metres or more in length operating in polar waters.



Maritime New Zealand would like to acknowledge and thank the stakeholders who have contributed to the development of this guidance.

#### **Disclaimer**

This publication provides general guidance on your duties under relevant legislation (including the Maritime Transport Act 1994, Maritime Rules and the Health and Safety at Work Act 2015). It is not possible for Maritime New Zealand to address every situation that could occur at work, and it is your obligation to ensure you are operating to the latest Maritime Rules and other legislation and to obtain legal advice where appropriate. This means that you need to think about this guidance and how best to apply it to your particular circumstances. Maritime New Zealand regularly reviews and revises guidance to ensure that it is up-to-date and reflects any changes in legislation, but you cannot rely on this guidance for currency. Please check [maritimenz.govt.nz/rules/](http://maritimenz.govt.nz/rules/) to confirm that you are referring to the current version of this publication.

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# 1. Introduction

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These guidelines offer advice for operators of fishing vessels of 24 metres in length or more that operate in polar waters but which are not certified under the SOLAS Convention 1974.

These guidelines are modelled on and clarify the IMO's International Code for Ships Operating in Polar Waters ('Polar Code').

The Polar Code is not mandatory for fishing vessels (or other non-SOLAS ships) under New Zealand law. However, non-SOLAS ships are operating with increasing frequency in polar waters – they are vulnerable to the same risks as SOLAS ships, such as:

- accidents or incidents that could cause serious injury or loss of life, and
- damage to, or loss of, the vessel.

Applying these voluntary guidelines will help operators of non-SOLAS ships in polar waters to safely navigate and manage the risks to their vessels, the people on board, systems and operations, and ensure they achieve the same level of safety as SOLAS vessels operating in polar waters.

## **More information**

[Polar Code \(IMO MSC.1/Circ.1641 of 14 May 2021\)](#)

## 2. General

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### 2.1 Purpose

This section provides guidance on general operating and safety arrangements.

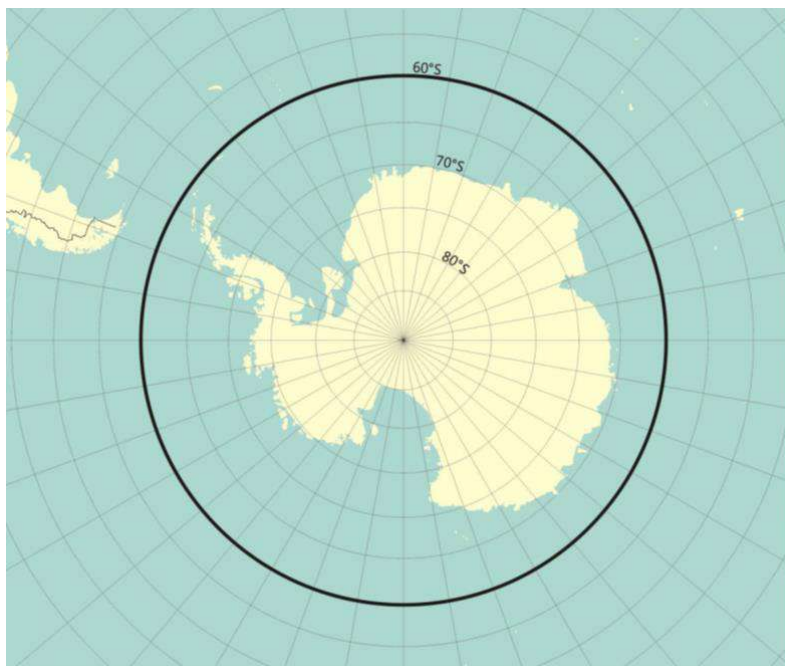
### 2.2 Hazards in polar waters

The following is a list of hazards which may expose fishing vessels to higher levels of risk, some of which are unique to polar conditions. The list is not exhaustive. Operators must carry out their own risk assessment to identify the hazards and risks unique to their operation, and eliminate or minimise the risks with appropriate control measures, so far as is reasonably practicable (required under the Health and Safety at Work Act 2015 and the Health and Safety at Work (General Risk and Workplace Management) Regulations 2016).

- 1 **Ice** – may affect hull structure, stability, machinery systems, navigation, the outdoor work environment, maintenance, safety equipment and systems.
- 2 **Topside icing** – may affect stability and equipment efficiency.
- 3 **Low temperature** – may affect work environment and human performance, maintenance and emergency preparedness tasks, material properties and equipment efficiency, survival time, and performance of safety equipment and systems.
- 4 **Extended periods of darkness/daylight** – may affect navigation and human performance.
- 5 **High latitude** – may affect navigation systems, communication systems and the quality of ice imagery information.
- 6 **Remoteness** – possible lack of accurate and complete hydrographic data and information or navigational aids and seamarks, leading to increased risk of groundings. Limited readily deployable search and rescue facilities and communications, delayed emergency response.
- 7 **Lack of experience in polar operations** – potential for human error.
- 8 **Lack of suitable emergency response equipment** – may reduce effectiveness of control measures.
- 9 **Rapidly changing and severe weather conditions** – potential for incidents to escalate.

## 2.3 Terms and definitions used in these guidelines

### Antarctic area



Waters south of 60° South.

### Arctic waters



Waters located north of a line from the latitude 58°00'.0 N and longitude 042°00'.0 W to latitude 64°37'.0 N, longitude 035°27'.0 W and thence by a rhumb line to latitude 67°03'.9 N, longitude 026°33'.4 W and thence by a rhumb line to the latitude 70°49'.56 N and longitude 008°59'.61 W (Sørkapp, Jan Mayen) and by the southern shore of Jan Mayen to 73°31'.6 N and 019°01'.0 E by the Island of Bjørnøya, and thence by a great circle line to the latitude 68°38'.29 N and longitude 043°23'.08 E (Cap Kanin Nos) and

|  |   |
|--|---|
|  | <p>hence by the northern shore of the Asian Continent eastward to the Bering Strait and thence from the Bering Strait westward to latitude 60° N as far as Il'pyrskiy and following the 60th North parallel eastward as far as and including Etolin Strait and thence by the northern shore of the North American continent as far south as latitude 60° N and thence eastward along parallel of latitude 60° N, to longitude 056°37'.1 W and thence to the latitude 58°00'.0 N, longitude 042°00'.0 W.</p> |
| <b>Directional control system</b>              | <p>Any device or devices intended either as a primary or auxiliary means of steering the ship. The directional control system includes all associated power sources, linkages, controls and actuating systems.</p>  |
| <b>Escort</b>                                  | <p>Any ship with superior ice capability in transit with another ship.</p>  |
| <b>Hull penetrations</b>                       | <p>Areas where water can get into the hull, including seawater inlets, rudder pintails and propeller shaft seals.</p>   |
| <b>Ice accretion</b>                           | <p>The build-up of frozen seawater on ships. As soon as the sea surface temperature drops below +4° C, spray and waves can form ice on the deck and superstructures. The ice that forms can increase the weight of a ship.<sup>1</sup></p>  |
| <b>Ice-covered waters</b>                      | <p>Polar waters where local ice conditions present a structural risk to a ship.</p>   |
| <b>Icebreaker</b>                              | <p>Any ship whose operational profile may include escort or ice management functions, whose powering and dimensions allow it to undertake aggressive operations in ice-covered waters.</p>  |
| <b>Ice of land origin</b>                      | <p>Ice formed on land or in an ice shelf, found floating in water.</p>  |
| <b>Maritime Transport Operator Plan (MTOP)</b> | <p>Documents a maritime transport operator safety system and the associated documents required by Maritime Rule Part 19 (such as the safe operating procedures)</p>   |
| <b>Maximum expected rescue time</b>            | <p>The time adopted for the design of equipment and systems that provide survival support. It should typically be not less than five days.</p>  |

<sup>1</sup> (2015) Swedish Meteorological and Hydrological Institute. See [www.smhi.se/en/theme/ice-accretion-1.84870](http://www.smhi.se/en/theme/ice-accretion-1.84870)

|  |  |
|--|--|
| <b>Mean Daily Low Temperature (MDLT)</b>               | 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.                  |
| <b>Open water</b>                                      | 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.   |
| <b>Operate in relation to a ship</b>                   | To sail or use the ship, or cause or permit the ship to sail, be used, or be in any place, whether or not the person is present with the ship, and operating, operation, and operator have corresponding meanings. |
| <b>Polar service temperature (PST)</b>                 | A temperature specified for a ship which is intended to operate in low air temperature, which should be set at least 10° C below the lowest MDLT for the intended area and season of operation in polar waters.    |
| <b>Polar waters</b>                                    | Includes both Arctic waters and the Antarctic area.  |
| <b>Recognised organisation</b>                         | An entity assessed by the Director of Maritime NZ as meeting the minimum assessment requirements in Part 2 of the RO Code and holding authorisation to perform statutory certification and services.               |
| <b>Sea ice</b>   | Any form of ice found at sea which has originated from the freezing of seawater.   |
| <b>Ship intended to operate in low air temperature</b> | A ship intended to undertake voyages to or through areas where the lowest MDLT is below -10°C.   |
| <b>Sufficient positive stability</b>                   | The ship is in a state of equilibrium with a positive metacentric height of at least 150 mm, and a line 150 mm below the edge of the freeboard deck, is not submerged.   |

## 2.4 Performance standards

Unless provided otherwise, fishing vessel systems and equipment addressed in these guidelines should satisfy at least the same performance standards referred to in New Zealand Maritime Rules or the appropriate requirements of a recognised organisation.

Special attention should be given to essential operating and safety equipment. For example, consider the potential for ice building up inside ballast tanks, sea chests and in other areas that can be penetrated through the hull. Fire-extinguishing and lifesaving equipment, when stored or located in an exposed position, should be of a type that is rated to perform its design



functions at the mean daily low temperature. In particular, attention is drawn to the inflation of lifesaving equipment and the starting of engines in lifeboats and rescue boats.

For fishing vessels operating in low air temperature, a PST should be specified which should be at least 10°C below the lowest MDLT for the intended area and season of operation in polar waters. Systems and equipment recommended by these guidelines should be fully functional at PST.

For fishing vessels operating in areas of low air temperature (where the lowest MDLT is below -10°C), survival systems and equipment should be fully operational at PST during the maximum expected rescue time.

## **2.5 Who can help?**

Operators may wish to seek advice from their surveyor on how their vessel performs against these guidelines. For example, an operator may ask their surveyor to assess the effect of icing in the stability calculations (see section 4). Or an operator may choose to talk with operators of other New Zealand flagged vessels that operate in polar waters to share solutions.

## **2.6 Operational arrangements**

Fishing vessels should not be operated outside their worst intended conditions and design limitations. These details should be set out in the MTOP or Polar Operating Supplementary Manual (POSM) (see 2.8 below). The distance from search and rescue facilities should be taken into account.

Operators should carry out a risk assessment of vessel and equipment. The assessment will test whether the vessel is fit to be operated in polar waters and establish procedures or operational limitations. The assessment might consider the following:

- the anticipated range of operating and environmental conditions, such as:
  - operation in low air temperature and ice
  - operation in areas, and during periods, where ice accretion is likely
  - operation in high latitude, and
  - potential for abandonment onto ice or land
- hazards in polar waters. (See 2.2 above.)

## 2.7 Documentation

An MTOP or safety management system may already address many of the sections in these guidelines. An operator may decide to create a POSM containing information directly relevant to operations in polar waters. The POSM is intended to provide people on board with information regarding the vessel's operational capabilities and limitations in order to support their decision-making process. The POSM might include the type of information and procedures suggested below. Not every issue on the list will be applicable to every fishing vessel.

### Suggested content for an MTOP or POSM



Details of the vessel's capabilities and limitations relevant to normal operations and to anticipated ice conditions and temperatures, including:

- systems susceptible to damage or loss of functionality by exposure to low temperatures, and measures to avoid malfunction
- limits of vessel endurance such as fuel tankage, freshwater capacity, stores of provisions
- icing allowance included in the stability calculations.



Procedures for:

- operating in normal conditions including how to avoid encountering icy conditions that exceed the vessel's capabilities
- managing incidents in polar waters such as evacuations and damage control
- checking the integrity of the hull structure in polar conditions
- voyage planning to avoid ice and/or temperatures that exceed the vessel's capabilities or limits
- controlling the risks of difficult ice conditions, including the use of low speeds in the presence of hazardous ice
- enhanced watch-keeping and lookout crewing in high-risk situations. For example, around icebergs, operating at night or in other situations of low visibility. Where hazardous ice is present, there should be regular monitoring. For example, soundings or inspections of compartments and tanks below the waterline
- establishing the requirements for supplies and appropriate safety levels for safety margins, taking into account various scenarios. For example, slower than expected steaming, course alterations, adverse ice conditions, places of refuge and access to provisions

- increasing the effectiveness of emergency response where risks specific to polar conditions are likely
- maintaining life support and vessel integrity if trapped by ice.

Measures to maintain equipment and system (especially communications and navigational) functionality in polar temperatures, topside icing and the presence of sea ice, as applicable.

Description and operation of fire detection and fire-extinguishing equipment in a polar environment.

Guidance about:

- eliminating or minimising the risk of icing by operational means, and how to monitor and assess ice accretion, conduct de-icing, and maintain the safety of the vessel and people on board
- how to monitor, prevent, or control the risks of ice ingestion by seawater systems in polar conditions
- human resources management, taking into account anticipated ice conditions and requirements for ice navigation, increased levels of watch-keeping, hours of rest, and fatigue.

Arrangements for receiving forecasts of the environmental conditions, including appropriate ice and weather information.

Arrangements for addressing any limitations of the hydrographic, meteorological and navigational information available.

Details for contacting emergency response providers for such things as salvage, search and rescue, spill response.

## 3. Construction and watertight integrity

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### 3.1 Purpose

This section sets out standards sufficient to maintain structural construction and watertight integrity for fishing vessels operating in polar conditions.

### 3.2 General

The ship structure should be designed to resist anticipated global and local loads in icy conditions. Structural arrangements should limit damage from accidental overloads to local areas of the ship structure. Operators and their surveyor should consider assessing the vessel against this section.

### 3.3 Materials

- For fishing vessels intended to operate in low air temperature, materials used should be suitable for operation at the vessel's PST.
- Abrasion and corrosion-resistant coatings (hull paint) and claddings used in ice-strengthened areas of the hull should be matched to the anticipated loads (contact with ice, for example) and structural response.

### 3.4 Weathertight integrity

- All closing appliances and doors relevant to watertight and weathertight integrity should operate in polar conditions.
- When operating in areas and during periods where ice accretion is likely, means should be provided to remove or prevent ice and snow accretion around hatches and doors.
- If hatches or doors are hydraulically operated, means should be provided to prevent freezing or a high level of thickness in liquids (high viscosity).
- Watertight and weathertight doors, hatches and closing devices which are not within a habitable environment and require access while at sea, should be capable of being operated by people wearing heavy winter clothing including thick gloves.

### 3.5 Subdivision

- Where double bottoms are fitted over the breadth and the length between forepeak and afterpeak bulkheads, the height of the double bottom should be in accordance with the rules of a recognised organisation.

## 4. Stability

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### 4.1 Purpose

This section sets out standards for stability of fishing vessels in both intact and damaged conditions.

### 4.2 General

Operators should take account of the effect of icing in the stability calculations in accordance with the International Code on Intact Stability, 2008 (2008 IS Code). Surveyors should refer to relevant parts of the code to guide their assessment of the effect of icing on the vessel's stability.

### 4.3 Stability in intact conditions

An MTOP or POSM (see 2.7 above) should include information on the icing allowance included in the stability calculations.

Ice accretion should be monitored and appropriate measures taken to ensure it does not exceed the values given in the POSM.

For each standard loading condition, vessels should be shown by design calculations to meet the intact stability criteria in Maritime Rule Part 40D.

### 4.4 Stability in damaged conditions

Vessels over 100 m in length or carrying more than 100 passengers should consider vessel stability in damaged conditions, taking into account the type of vessel, the intended service, and area of operation.

## 5. Machinery and electrical installations

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### 5.1 Purpose

This section sets out the required functionality for machinery and electrical installations necessary for the fishing vessel's safe operation.

### 5.2 General

The design, rating, installation, operation and ease of maintaining all onboard machinery and equipment should be suitable for polar conditions. Factors to be taken into account include:

- ice accretion and/or snow build-up
- ice ingestion from seawater intake pumps
- freezing and increased viscosity of liquids
- seawater intake temperature, and
- snow ingestion.

In addition, for fishing vessels operating in low air temperatures, factors to be taken into account include:

- cold and dense inlet air, and
- loss of performance of battery or other stored energy device.

Materials used for machinery and electrical installations should be suitable for the PST. In particular, machinery and electrical installations that are essential for safe operation when:

- located outside and above the waterline in any operating condition, or
- in unheated locations inside

should not be vulnerable to brittle fracture within the range of operating conditions.

For vessels intended to operate in ice-covered waters, machinery and electrical installations should provide functionality under the expected environmental conditions, taking into account loads imposed directly on the vessel by impact with ice.

Machinery that is essential for the safe operation of the fishing vessel should be designed and constructed in a way that effective repairs can be made to the vessel using the resources on board. Repairs to machinery should be made safely.

Ventilation systems should provide sufficient air at an appropriate temperature for the operation of machinery.

Operators should consider appropriate heat sources to support the proper functioning of machinery and electrical installations in the expected environmental conditions.

### **5.3 Main propulsion systems**

The main propulsion machinery should be designed and protected against the effects of the expected environmental and operational conditions. The reliability and availability of the equipment and systems, including spare parts for components which can be readily repaired, should be considered.

Main propulsion machinery and all auxiliary machinery essential to the propulsion system should be:

- designed for loads and vibrations resulting from propeller/hull/rudder-ice interactions
- located to provide protection from freezing spray, ice and snow
- designed to operate when the vessel is inclined at any combined angle of heel or trim that may be expected during operations in ice, and
- designed to be protected from a direct hit by ice.

The installed propulsive power should be sufficient to ensure that the vessel can navigate safely, without risk of structural damage under the design ice, weather and expected operational conditions.

Piping and intake systems associated with the main propulsion plant and auxiliary machinery essential to the propulsion system should be designed to withstand frost.

### **5.4 Auxiliary machinery systems**

Equipment and systems should be designed so that exposure of people on board to cold temperatures and other environmental risks during normal operations including routine maintenance is minimised.

Essential equipment or systems required for safe operation that could be subject to outside ambient air temperatures if the primary heating system fails should be:

- provided with an independent source of heat, and
- fabricated from materials that are not vulnerable to brittle fracture under the expected loads and temperatures.

### **5.5 Directional control systems**

Directional control systems should have appropriate strength and design to operate in polar waters.

If the main propulsion system is connected to the directional control system, or where dual-purpose components are fitted, the requirements in 5.3 apply.

## 5.6 Electrical installations

Electrical installations should be designed for operation in polar waters and for the provision of emergency heat and power.

Vessels that intend to operate in ice-covered waters should put in place appropriate control measures to minimise the risk, so far as is reasonably practicable, of interruption of electrical supply to essential and emergency services.

Interruption may be caused by the unplanned or accidental opening of switches or circuit breakers due to vibrations or accelerations during icebreaking operations.

Emergency power batteries should be secured in a position where excessive movement is prevented during ice-transiting operations and explosive gas ventilation is not restricted by the accumulation of ice or snow.<sup>2</sup>

Control systems based on computers and other electronic hardware installations necessary for the proper functioning of essential equipment should be designed for:

- redundancy (multiple ways to achieve the task)
- resistance to vibration
- dampness, and
- low humidity.

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<sup>2</sup> This includes the reserve source of energy for the radio installation and emergency power batteries stored in deck boxes.



## 6. Fire-fighting, protection, detection and extinction

### **6.1 Purpose**

This section sets out standards for fire safety systems and appliances on fishing vessels to ensure they are effective and operable in polar conditions and that people on board can safely and swiftly escape in an emergency.

### **6.2 General**

Components of fire safety systems and appliances should be designed to ensure they operate effectively at PST.

Fire safety systems and appliances, local equipment and machinery controls, and accessways should be protected from, or kept clear of, ice and snow.

Fire safety systems and appliances should be able to be operated as intended by people wearing bulky polar clothing.

The right equipment (for example, liquids, powders, foam and gases) should be used for the situation.

### **6.3 Ventilation**

Openings to ventilation inlets and outlets should be designed and located to protect them from ice or snow build-up.

### **6.4 Fire detection and fire-extinguishing systems**

Fire-extinguishing systems should be designed or located away from ice or snow build-up.

Equipment, appliances, systems and extinguishing agents should be protected from freezing.

Precautions should be taken to prevent nozzles, piping and valves of fire-extinguishing systems from becoming clogged by impurities, corrosion or ice and snow build-up.

Exhaust gas outlets and pressure vacuum arrangements should be protected from ice and snow build-up.

Water or foam extinguishers should not be located in any place exposed to freezing temperatures. These locations should be provided with extinguishers suitable for freezing temperatures.

## **6.5 Fire pumps and associated equipment**

The sea suction for a fixed water-based fire-extinguishing system (or an alternative fire-extinguishing system) should be capable of being cleared of ice build-up.

Fire pumps, including emergency fire pumps, water mist and water spray pumps should, wherever reasonable and practicable, be installed in heated compartment(s) and be protected from freezing.

Isolating valves should be located so that they are accessible. Any isolating valves located in exposed positions should not be subject to icing from freezing spray. The fire main should be arranged so that exposed sections can be isolated and drained.

Hydrants should be positioned or designed so that they operate as intended at all anticipated temperatures. All hydrants should be equipped with an efficient two-handed valve handle.

Fishing vessels operating in low air temperature should have portable and semi-portable extinguishers located in positions protected from freezing temperatures.

## **6.6 Firefighters' outfits**

The firefighters' outfits, including one spare, should be available close to the accommodation area and elsewhere as appropriate. Such outfits should be stored in warm positions as widely separated as practicable.

## 7. Protection of people on board

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### 7.1 Purpose

This section sets out standards for the protection of people on board when the vessel is operating in polar water conditions.

### 7.2 General

Particular care should be taken to ensure that decks have been designed or treated to minimise the possibility of slipping in icy deck conditions.

Fishing vessels should have reliable facilities in a large enough quantity to maintain a life-sustaining environment in the event of an emergency and/or being trapped in ice for an extended period. See section 8 for guidance on creating personal and group survival kits.

### 7.3 Bulwarks, rails and guards

Bulwarks or guard rails should be fitted on all exposed parts of the working deck and on superstructure decks (if they are working platforms). Bulwarks should be designed to provide adequate protection of people on board in polar conditions.

### 7.4 Stairways and ladders

All stairways and ladders should be wide enough to be used safely by people wearing suitable polar clothing.

### 7.5 Other safety measures

Accommodation must be designed and arranged to protect people from polar conditions and minimise the risk of injury during normal (including ice transiting or icebreaking) operations and emergencies.

### 7.6 Means of escape

Escape routes from accommodation or working spaces in the vessel should remain operational even when threatened by ice accretion or low external air temperatures.

Escape routes should remain accessible and safe, taking into consideration the potential icing of structures and snow accumulation. They should be wide enough to not hinder passage for people wearing suitable polar clothing.

All means of escape from accommodation or interior working spaces in response to fire should be planned according to the guidelines in section 6.

## 8. Lifesaving appliances and arrangements

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### 8.1 Purpose

This section sets out standards for the safe escape, evacuation and survival of people on board.

### 8.2 General

- Fishing vessels should carry lifesaving appliances and survival equipment suited to the polar environment.
- All survival craft and rescue boats should be designed so they provide effective protection against possible difficult environmental conditions including direct wind chill, for all on board.
- Adequate supplies of protective clothing and thermal insulating materials should be provided, taking into account the intended voyage, anticipated weather conditions and the potential for a person to enter polar water.
- Survival craft should have sufficient space to accommodate people wearing polar clothing.
- Survival craft should carry equipment to communicate with rescue assets that is appropriate for use in polar conditions.
- Survival craft should carry adequate emergency rations for the maximum expected time of rescue, taking account of high rates of energy expenditure under polar conditions.
- See Maritime Rule 40D Appendix 1 for the requirements for carrying immersion suits.
- Maritime Rule 40D.37 and Maritime Rule 42A.26 require that one anti-exposure suit complying with the requirements of the International Lifesaving Appliances Code must be provided for every person that does not have an immersion suit.
- Training in the use of emergency procedures and equipment must be included as an element of the operating procedures and drills described in section 9.

All survival craft, rescue boats, lifesaving appliances, associated equipment, and survival equipment should:

- be designed to remain functional under possible difficult environmental conditions during the maximum expected time of rescue, and
- take account of the potential of operation in long periods of darkness, taking into consideration the intended voyage.

### 8.3 Boarding the survival craft

- Survival craft boarding arrangements should not prevent passage by people wearing polar clothing.
- Survival craft boarding arrangements should be adequate to ensure the safety of people on board taking into consideration the possible adverse environmental conditions.

Survival craft boarding arrangements should be suitable for the safe deployment of survival craft and associated equipment. The safe deployment plan should be functional under the possible adverse environmental conditions during the maximum expected time of rescue. Where survival equipment requires a power source, this should be able to operate independently of the vessel's main power source.

### 8.4 Lifeboats

All lifeboats, where carried, should be partially or totally enclosed to provide adequate shelter from the expected operating environment. The capacity of lifeboats should be assessed, taking into consideration:

- operability
- accessibility
- seating capacity and overall space
- the needs of people wearing suitable polar clothing.

- Ice accretion should be regularly removed from the lifeboats, launch area and launching equipment to ensure readiness for launching when required. An ice removal mallet should be available close to the lifeboats.
- All lifeboat engines should be equipped with a means to ensure they start readily when required at the MDLT.
- The lifeboat engine fuel oil should be suitable for operation in the minimum anticipated operating temperature.
- For vessels intended to operate in extended periods of darkness, each lifeboat should be provided with searchlights suitable for continuous use to support identification of ice.
- Lifeboats and containers for group survival equipment in their stowed position should have a way to control the risk of drinking water freezing.

## 8.5 Liferafts

- Any ice accretion should be regularly removed from the liferafts, cradles, launch area and launching equipment to ensure readiness for launching and inflation when required. An ice removal mallet should be available close to the liferafts.
- Air or other proven cold temperature gas should be used for the inflation of lifesaving equipment according to their environmental conditions of operation.

## 8.6 Additional survival kits for polar conditions

- Sufficient personal and group survival kits should be carried to cover at least 110% of the people on board.
- Personal survival kits (PSK) should be carried where a voyage is anticipated to encounter mean daily temperatures below 0°C.
- PSKs should be stored in locations where they can be easily found in an emergency situation. Storing the PSKs in dedicated lockers near the assembly stations may be considered.
- People on board should be advised as appropriate that their PSK is for emergency survival use only and items should not be removed from the carrying bag.

## 8.7 Suggested contents of a Personal Survival Kit

- |  |                           |                          |
|--|---------------------------|--------------------------|
| <input type="checkbox"/> protective clothing (such as a hat, gloves, socks, face and neck protection, thermal underwear) | signal mirror             | <input type="checkbox"/> |
| <input type="checkbox"/> skin protection cream   | personal locator beacon   | <input type="checkbox"/> |
| <input type="checkbox"/> insulated immersion suit  | drinking mug              | <input type="checkbox"/> |
| <input type="checkbox"/> hand warmers  | emergency food            | <input type="checkbox"/> |
| <input type="checkbox"/> sunglasses or goggles   | penknife                  | <input type="checkbox"/> |
| <input type="checkbox"/> whistle   | handbook (Polar Survival) | <input type="checkbox"/> |
| <input type="checkbox"/> carrying bag  |                           |                          |

## 8.8 Group Survival Kit

Group survival kits (GSK) should be carried whenever a voyage is expected to encounter ice conditions which may prevent the lowering and operation of survival craft, potentially involving abandonment onto ice or land.

GSKs should be stored so that they may be easily found and deployed in an emergency situation. Any containers should be located adjacent to the survival craft and liferafts. Containers should be designed so that they may be easily moved over the ice and be floatable.

PSK and GSK inspections should be carried out at least annually. Where PSK and/or GSK are fitted, consideration should be given to providing additional kits for training and demonstration purposes.

## 8.9 Suggested contents of a Group Survival Kit

|                          |   |  |                          |
|--------------------------|---|--|--------------------------|
| <input type="checkbox"/> | shelter (tents, storm shelters or equivalent) for maximum number of people                  | whistle x 1  | <input type="checkbox"/> |
| <input type="checkbox"/> | foam sleeping mats or similar – at least one between two people                             | signal mirror x 1  | <input type="checkbox"/> |
| <input type="checkbox"/> | sleeping bags – at least one between two people   | emergency position indicating radio beacon x 1   | <input type="checkbox"/> |
| <input type="checkbox"/> | shovels – at least two  | communications equipment, separate from that carried on the vessel or survival craft – as required | <input type="checkbox"/> |
| <input type="checkbox"/> | stove and fuel – for maximum number of people ashore and maximum anticipated time of rescue | sanitation (for example, toilet paper) – as required   | <input type="checkbox"/> |
| <input type="checkbox"/> | emergency food – for maximum number of people ashore and maximum anticipated time of rescue | spare set of personal survival equipment – as required   | <input type="checkbox"/> |
| <input type="checkbox"/> | first aid kit in a waterproof case – at least one   | snow saw and snow knife x 1  | <input type="checkbox"/> |
| <input type="checkbox"/> | flashlights – one per shelter   | tarpaulin x 1  | <input type="checkbox"/> |
| <input type="checkbox"/> | waterproof and windproof matches – two boxes per shelter                                    | group survival equipment container (waterproof and floatable)                                      | <input type="checkbox"/> |

## 9. Emergency procedures, musters and drills

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### 9.1 Purpose

This section sets out standards to ensure people on board fishing vessels are adequately trained and familiar with emergency procedures, duties, musters and drills specific to polar waters.

### 9.2 General

Regular emergency drills should be carried out. See Maritime Rules Part 23 for the procedures that operators of fishing vessels must implement to manage emergencies. Operators should keep a record of drills carried out.

### 9.3 Instructions for emergency operations onboard vessels

Instructions for emergency procedures including drills should be included in the training manual referred to in section 12.7.

People on board should know how to operate the vessel's lifesaving, fire and damage control appliances and systems in an emergency. Other information may be useful such as:

- general first aid, and
- how to treat people affected by cold shock, snow blindness, sunburn, and hypothermia.

### 9.4 'Abandon ship' drills

'Abandon ship' drills should be varied so that different emergency conditions are simulated, including abandonment into the water, onto the ice, or a combination of these.

'Abandon ship' drills could include:

- checking that everyone is suitably dressed
- putting on immersion suits and thermal protective clothing
- testing of emergency lighting for assembling and abandonment, and
- giving instructions in the use of lifesaving appliances and survival at sea, on the ice, or a combination of both.

### 9.5 Rescue boat drills

Rescue boat drills should be conducted so far as is reasonably practicable, taking into account the risks of launching into polar ice-covered waters.



## **9.6 Fire drills**

Fire drills should be varied so that emergency conditions are simulated for different compartments of the vessel. Standard procedures may need to be adjusted to take into account operations in polar conditions.

## **9.7 Damage control drills**

If an operator calculated damaged stability in section 4, they should also carry out damage control drills. Drills should be varied so that emergency conditions are simulated for different damage conditions. Standard procedures may need to be adjusted to take into account operations in polar conditions.

## **9.8 Emergency towing drills**

Regular simulated emergency towing drills should be carried out.

# 10. Radio-communications

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## 10.1 Purpose

This section provides standards for effective communication for fishing vessels and survival craft in polar waters during normal operations and emergencies.

## 10.2 General

Communication equipment should be suitable to provide adequate ship-to-ship and ship-to-shore communication at all points on intended routes. Equipment needs to be operational in an environment where high latitudes and low temperature can affect communications.

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

The vessel should have:

- a means of two-way on-scene and search and rescue coordination communications including aeronautical frequencies
- appropriate communication equipment to enable telemedical assistance in polar areas
- battery-powered emergency communication equipment including a way to protect batteries from extreme low temperatures.

## 10.3 Survival craft and rescue boat communication capabilities

Communication equipment for use in survival craft, including liferafts, and rescue boats should be capable of operating during the maximum expected time of rescue.

## 10.4 Fishing vessels operating in low air temperatures

All rescue boats and lifeboats, where released for evacuation, should be capable of distress alerting, locating and on-scene communications.

All other survival craft, where released, should be capable of transmitting signals for location and on-scene communications.

# 11. Shipborne navigational equipment and arrangements

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## 11.1 Purpose

This section covers safe navigation in polar waters.

## 11.2 General

Navigational equipment and systems for providing reference headings and position fixing should be designed, constructed, and installed to operate as intended:

- under expected environmental conditions
- in the intended area of operation
- with the performance limiting effect of high latitudes.

Fishing vessels should have a way of receiving and displaying current and forecast information about ice conditions in their intended area of operation.

Sensors, antennas and other navigational equipment should be protected from ice accretion.

## 11.3 Additional navigational equipment for polar waters

- Fishing vessels should be fitted with:
  - two non-magnetic means to determine and display their heading
  - at least one appropriate speed and distance measuring system
  - at least two independent echo-sounding devices which provide an indication of the depth of water under the keel. Due account should be taken of the potential for ice interference or damage to any device designed to operate below the waterline
  - at least two functionally independent radar systems. One of these should operate in the 3 GHz (10 cm, S-band) frequency range
  - a suitable means to de-ice sufficient helm position windows to enable watch-keeping.
- Radars equipped with enhanced ice-detection capability should be encouraged.
- Radar-plotting systems should be capable of operating in 'sea' and 'ground stabilised' modes.
- A satellite system (GPS, GLONASS or equivalent) should be fitted on vessels operating outside of reliable coverage by a land-based hyperbolic radio navigation system.
- Fishing vessels should have automatic identification system (AIS). Where AIS or vessel monitoring system (VMS) coverage is poor, the vessel's position should be reported manually.
- Separate rudder angle indicators should be provided for each rudder on fishing vessels with more than one independently operable rudder.

- Fishing vessels should be equipped with suitable searchlights that provide, so far as is reasonably practicable, all-round illumination suitable for berthing, astern manoeuvres or emergency towing. Searchlights should be fitted with an adequate means of de-icing to ensure proper directional movement.
- All indicators providing information to the helm positions should be fitted with a way of illumination control to ensure they can be read in all operational conditions.

## 11.4 Vision enhancement equipment

Windows positioned at the helm should be fitted with an efficient means of clearing melted ice, freezing rain, snow, mist and spray from outside and accumulated condensation from inside.

A mechanical means to clear moisture from the outside face of a window should have operating mechanisms protected from freezing or the accumulation of ice that would prevent effective operation.

Everyone engaged in navigating the vessel should be provided with adequate protection from direct and reflected glare from the sun.

## 11.5 Navigating from chart information in polar waters

Chart coverage of polar waters in many areas may not be adequate for coastal navigation.

Navigational officers should:

- exercise care to plan and monitor their voyage, taking account of the information and guidance in the appropriate nautical publications
- be familiar with the status of hydrographic surveys and the availability and quality of chart information for the areas in which they intend to operate
- be aware of potential differences between chart datum and the GNSS positioning, and
- aim to plan their route through charted areas well clear of known shoal depths, following established routes where possible.

Any deviations from the planned route should be done with particular caution. When operating on the continental shelf, for example:

- the echo-sounder should be monitored to detect any sign of unexpected depth variation, especially when the chart is not based on a full search of the sea floor, and
- independent cross-checking of positioning information (for example, visual and radar fixing and GNSS) should be done at every opportunity. Mariners should report any information that might contribute to improving nautical charts and publications to

[Land Information New Zealand](#)

## 12. Other safety measures

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### 12.1 Purpose

This section sets out additional measures for the safety of fishing vessels and people onboard.

### 12.2 Anchoring and towing

Fishing vessels should, so far as is reasonably practicable, be designed so the anchor is protected from being dislodged from its stowed position and from jamming or damaging the hull by direct impact with ice.

Anchoring systems should have an independent means of securing the anchor so the anchor cable can be disconnected for use as an emergency towing bridle.

Fishing vessels should be capable of anchoring and providing limited assistance in the case of severe damage or breakdown, to help prevent a catastrophic incident or the loss of a vessel (so far as is reasonably practicable).

The capability of vessels to provide assistance should be considered, having due regard to the lack of repair facilities, the limited number of dedicated towing vessels available and the response time that may be required by a dedicated towing vessel to be able to provide effective assistance in polar ice-covered waters.

Fishing vessels should be capable of receiving emergency towing assistance.

Where appropriate, towing arrangements should facilitate connection and release of a towline and provide bollards, fairleads, and other components suitable for the size of vessel on which they are fitted.

### 12.3 Fishing vessels designed to perform dedicated towing operations

Fishing vessels designed to perform dedicated towing operations should have:

- a line-throwing device in addition to that required for lifesaving. The device should be capable of delivering messenger lines for the transfer of towing equipment. The device should not be of the powder or rocket type so that it may be safely used to make a transfer to a tanker
- a quick-release system, operable from the conning position.

Where fitted, close-coupled bow to stern towing arrangements should include strengthened bow plating on the towed vessel, appropriate towing slings, non-interfering positioning of bower anchors and a bow that is not bulbous. In this case, the anchor should be able to be secured in a stowed position.

## **12.4 Fuel and other flammable fluid tanks and systems**

Where applicable, refuelling of fishing vessels should take into account the special conditions imposed by low temperatures and ice conditions.

## **12.5 Emergency equipment**

Fishing vessels should have an adequate number of first aid kits and equipment with contents suitable for an onboard location and its risks.

Medical equipment, medicines and facilities should take into account:

- the nature of the voyage
- vessel operations, and
- the ability to communicate and receive timely medical aid and/or evacuation, or other medical assistance.

People on board should be provided with the necessary equipment and training to be able to safely evacuate a person from the vessel in a medical emergency.

Consideration should be given to the reserve supply of fuel and lubricants, taking into account the effect of heavy ice on fuel consumption.

Fishing vessels in remote areas should consider carrying spare parts and equipment, including the following emergency equipment:

- portable gas welding and cutting equipment with a reserve of supplies, and
- portable electro-submersible pump of 100 tonnes/h capacity, with a set of hoses.

## **12.6 Crewing**

Crewing arrangements should consider:

- the relative lack of shore and support infrastructure which may be available to assist in any operations
- anticipated ice conditions and requirements for ice navigation, increased levels of watchkeeping, hours of rest, and fatigue.

## **12.7 Training**

In addition to the training requirements specified in the International Convention on Standards of Training, Certification and Watchkeeping for Fishing Vessel Personnel, 1995 (STCW-F Convention), consideration should be given to additional training that may be required to equip people on board to operate safely in conditions specific to polar waters.

As a minimum, everyone on board should be familiar with cold weather survival by training or self-study course material or publications addressing, in particular, 'abandon ship' drills (see section 9.4).

The vessel's deck and engine officers should have appropriate training and/or experience in operations in ice-covered waters.

Officers in charge of navigation should have appropriate training and/or experience in recognising navigational dangers specific to polar ice-covered waters.

Everyone on board should be familiar with the relevant procedures and equipment in the POSM (if one is carried), referred to in section 2.7.

In addition, fishing vessels should consider carrying a training manual covering relevant aspects of operations in polar waters. Information in the manual might include:

- these guidelines
- ice recognition
- navigation in ice and
- escorted operations.

## 12.8 Voyage planning

When planning a route through polar waters, the master of the fishing vessel should consider the following to avoid potential hazards:

- the procedures described in the MTOP or POSM referred to in section 2.7
- any limitations of hydrographic information and aids to navigation
- 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 on relevant routing systems, speed recommendations and vessel traffic services relating to known areas with densities of marine mammals, and seasonal migration areas
- national and international designated protected areas along the route
- operation in areas remote from search and rescue facilities.

## 13. Contact us for help

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If you need more information about safety in polar waters, see:

[maritimenz.govt.nz](http://maritimenz.govt.nz)

[maritimenz.govt.nz](http://maritimenz.govt.nz)

or send us an email:

[operators@maritimenz.govt.nz](mailto:operators@maritimenz.govt.nz)

or phone us toll-free:

**0508 22 55 22**

Please include your email address and phone numbers.



## 14. Appendix

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### 14.1 Managing the technical changes

Operators may use the action register below to keep a record of changes they plan to make to their vessel and how it is operated to reflect this guidance. This action register can be attached to an MTOP or POSM.

Table 1 Example Action Register

| # | Guidance section # | Vessel system     | Action                 | Comment  | Who is responsible? | Completed by |
|---|--------------------|-------------------|------------------------|--|---------------------|--------------|
| 1 | 11                 | Vessel fuel       | Add additive to fuel   | Use X additive product following manufacturer's instructions | Engineer            | X date       |
| 2 | 5                  | Hatches and doors | Place mallets on board | Mallets are for removing ice from hatches and doors          | Chief mate          | X date       |
|   |                    |                   |                        |  |                     |              |
|   |                    |                   |                        |  |                     |              |
|   |                    |                   |                        |  |                     |              |