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**GUIDELINES FOR SAFETY MEASURES FOR FISHING VESSELS  
OF 24 M IN LENGTH AND OVER OPERATING IN POLAR WATERS**

1 The Maritime Safety Committee, at its 103rd session (5 to 14 May 2021), approved the *Guidelines for safety measures for fishing vessels of 24 m in length and over operating in polar waters*, as set out in the annex, prepared by the Sub-Committee on Ship Design and Construction, at its seventh session (3 to 7 February 2020).

2 Member States are invited to use the annexed Guidelines and to bring them to the attention of all parties concerned.

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## **ANNEX**

### **GUIDELINES FOR SAFETY MEASURES FOR FISHING VESSELS OF 24 M IN LENGTH AND OVER OPERATING IN POLAR WATERS**

#### **PREAMBLE**

These Guidelines for fishing vessels of 24 m in length and over have been developed to supplement existing IMO instruments in order to increase the safety of fishing vessels operating in polar waters and persons on board and to mitigate the impact on the people and environment in the remote, vulnerable and potentially harsh polar waters.

These Guidelines are designed to align with the Cape Town Agreement of 2012, the entry into force of which is pending. The International Code for Ships Operating in Polar Waters (Polar Code) also provides useful context to the current Guidelines.

These Guidelines are recommendatory, and their wording is designed to provide guidance rather than mandatory direction and not intended to infringe on national systems of shipping control.

#### **INTRODUCTION**

##### **1 Purpose**

These Guidelines provide for the enhanced safety of fishing vessels of 24 m in length and over and persons on board by addressing risks specific to their operation in polar waters.

##### **2 Background**

These Guidelines were developed in acknowledgement that operating in polar waters imposes additional demands on vessel systems, including navigation, communications, life-saving, main and auxiliary machinery, environmental protection and damage control, beyond those normally encountered.

These Guidelines also recognize that safe operation in such conditions requires special attention to human factors, including crewing arrangements and training in emergency and operational procedures, to ensure safety in a polar environment.

These Guidelines focus on the need to ensure that fishing vessel systems are capable of functioning effectively under anticipated operating conditions and to provide adequate levels of safety in accident and emergency situations.

In June 2018, the Maritime Safety Committee reviewed safety measures for non-SOLAS ships operating in polar waters. The Committee noted the lack of a legal framework to allow for the mandatory application of the Polar Code to non-SOLAS ships, together with evidence regarding the number of accidents involving non-SOLAS ships operating in polar waters, particularly in the Antarctic area. Concluding that these facts revealed a significant risk to the safety of lives at sea and a continuing threat to the marine environment, the Committee determined that urgent action needed to be taken. These Guidelines are the result of the Committee's decision to develop recommendatory safety measures for fishing vessels of 24 m in length and over, operating in polar waters.

### **3 Source of hazards**

These Guidelines consider hazards which may expose fishing vessels to elevated levels of risk, some of which are unique to polar conditions. These include:

- .1 ice, as it may affect hull structure, stability characteristics, machinery systems, navigation, the outdoor working environment, maintenance and emergency preparedness tasks and malfunction of safety equipment and systems;
- .2 experiencing topside icing, with potential reduction of stability and equipment functionality;
- .3 low temperature, as it affects the working environment and human performance, maintenance and emergency preparedness tasks, material properties and equipment efficiency, survival time and performance of safety equipment and systems;
- .4 extended periods of darkness or daylight as it may affect navigation and human performance;
- .5 high latitude, as it affects navigation systems, communication systems and the quality of ice imagery information;
- .6 remoteness and possible lack of accurate and complete hydrographic data and information, reduced availability of navigational aids and seamarks with increased potential for groundings compounded by remoteness, limited readily deployable search and rescue (SAR) facilities, delays in emergency response and limited communications capability, with the potential to affect incident response;
- .7 potential lack of experience in polar operations, with potential for human error;
- .8 potential lack of suitable emergency response equipment, with the potential for limiting the effectiveness of mitigation measures; and
- .9 rapidly changing and severe weather conditions, with the potential for escalation of incidents.

The risk level within polar waters may differ depending on the geographical location and time of the year with respect to daylight, ice-coverage, etc. Therefore, mitigating measures suitable to address the above specific hazards may vary within polar waters and may be different in Arctic waters and the Antarctic area.

These Guidelines also recognize that, while Arctic waters and the Antarctic area have a number of similarities, there are also significant differences and that the specific features of the legal and political regimes applicable to their respective vulnerable marine environments should be taken into account.

## CHAPTER 1 GENERAL

### 1.1 Purpose

This chapter provides guidance on general operating and safety arrangements.

### 1.2 Application

These Guidelines provide guidance for fishing vessels of 24 m in length and over operating in polar waters.

### 1.3 Definitions

The following definitions are applicable to these Guidelines.

1.3.1 *Antarctic area* means the sea area south of latitude 60° S (see figure 1).

1.3.2 *Arctic waters* means those waters which are located north of a line from the latitude 58°00'.0 N and longitude 042°00'.0 W to latitude 64°37'.0 N, longitude 035°27'.0 W and thence by a rhumb line to latitude 67°03'.9 N, longitude 026°33'.4 W and thence by a rhumb line to the latitude 70°49'.56 N and longitude 008°59'.61 W (Sørkapp, Jan Mayen) and by the southern shore of Jan Mayen to 73°31'.6 N and 019°01'.0 E by the Island of Bjørnøya, and thence by a great circle line to the latitude 68°38'.29 N and longitude 043°23'.08 E (Cap Kanin Nos) and hence by the northern shore of the Asian Continent eastward to the Bering Strait and thence from the Bering Strait westward to latitude 60° N as far as Il'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 (see figure 2).

1.3.3 *Directional control system* means 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.

1.3.4 *Escort* means any ship with superior ice capability in transit with another ship.

1.3.5 *Hull penetrations* means areas where water can get into the hull, including seawater inlets, rudder pintles and propeller shaft seals.

1.3.6 *Ice-covered waters* means polar waters where local ice conditions present a structural risk to a ship.

1.3.7 *Icebreaker* means any ship whose operational profile may include escort or ice management functions, whose powering and dimensions allow it to undertake aggressive operations in ice-covered waters.

1.3.8 *Ice of land origin* means ice formed on land or in an ice shelf, found floating in water.<sup>1</sup>

1.3.9 *Maximum expected rescue time* means the time adopted for the design of equipment and systems that provide survival support. It should typically be not less than five days.

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<sup>1</sup> Refer to the WMO Sea-Ice Nomenclature.

1.3.10 *Mean Daily Low Temperature (MDLT)* means the mean value of the daily low temperature for each day of the year over a minimum 10-year period. A data set acceptable to the Administration may be used if 10 years of data is not available.

1.3.11 *Open water* means a large area of freely navigable water in which sea ice is present in concentrations less than 1/10. No ice of land origin is present.<sup>2</sup>

1.3.12 *Polar service temperature (PST)* means 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.

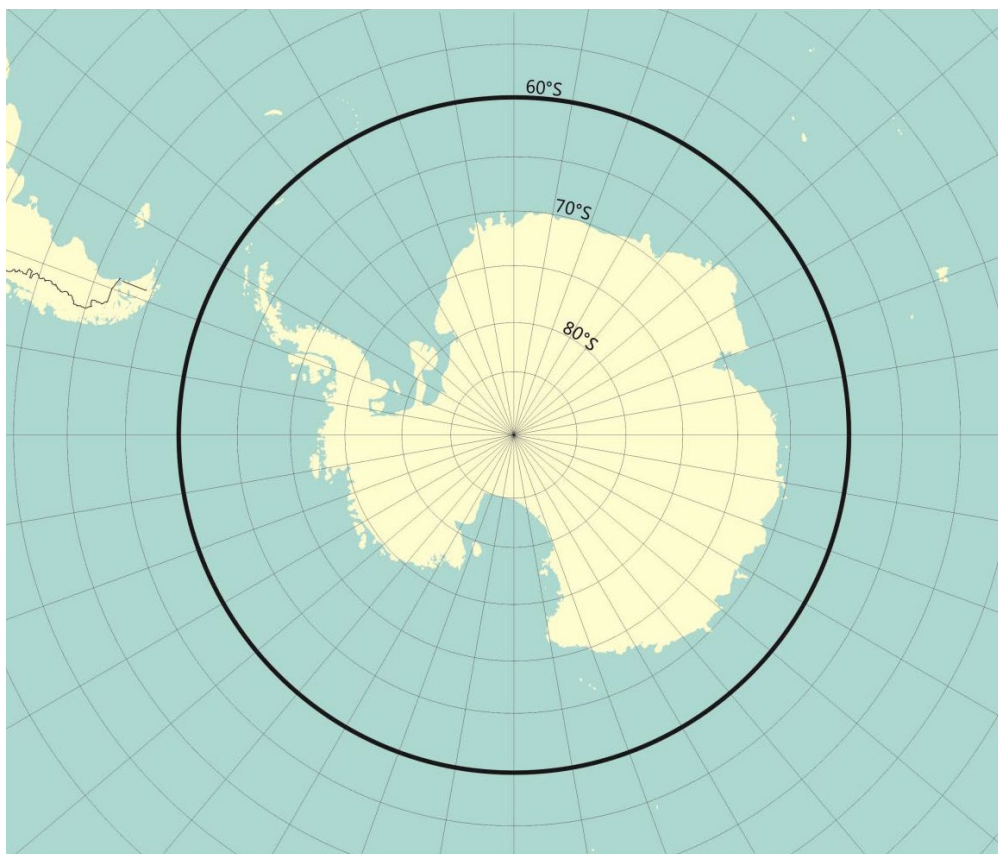
1.3.13 *Polar waters* includes both Arctic waters and the Antarctic area.

1.3.14 *Sea ice* means any form of ice found at sea which has originated from the freezing of sea water.

1.3.15 *Ship intended to operate in low air temperature* means a ship which is intended to undertake voyages to or through areas where the lowest MDLT is below -10°C.

1.3.16 *Sufficient positive stability* means that 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.

**Figure 1 – Maximum extent of Antarctic area application**



<sup>2</sup> Refer to the WMO Sea-Ice Nomenclature.

**Figure 2 – Maximum extent of Arctic waters application**



## 1.4 Performance standards

1.4.1 Unless provided otherwise, fishing vessel systems and equipment addressed in these Guidelines should satisfy at least the same performance standards referred to in the *FAO/ILO/IMO Code of Safety for Fishermen and Fishing Vessels*, 2005, the *FAO/ILO/IMO Voluntary guidelines for the design, construction, and equipment of small fishing vessels*, 2005, an applicable national standard or the appropriate requirements of a recognized organization.

1.4.2 Fishing vessels and their equipment should be designed, constructed and maintained in compliance with applicable national standards of the Administration or the appropriate requirements of a recognized organization or competent body which provide an equivalent level of safety for its intended service.

1.4.3 The structures, equipment and arrangements essential for the safety and operation of the fishing vessel should take account of the anticipated temperatures.

1.4.4 Special attention should be given to essential operating and safety equipment and associated systems. For example, the potential for ice building up inside ballast tanks, sea chests and in other potential areas that can be penetrated through the hull affecting the ballast and piping system respectively should be considered. The fire-extinguishing and life-saving equipment specified in chapters 5 and 7, respectively, when stored or located in an exposed position, should be of a type that is rated to perform its design functions at the MDLT. In particular, attention should be given to the inflation of life-saving equipment and the starting of engines in lifeboats and rescue boats.

1.4.5 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.

1.4.6 For fishing vessels operating in low air temperature, survival systems and equipment should be fully operational at PST during the maximum expected rescue time.

## **1.5 Operational arrangements**

1.5.1 Fishing vessels not required to have a safety management system (International Safety Management (ISM) Code or similar) should carry on board a supplementary operating manual containing information directly relevant to operations in polar waters. Information that might be included in such a manual is suggested in paragraph 1.6.2.

1.5.2 The vessel should not be operated outside the worst intended conditions and design limitations, the details of which should be set out in the supplementary operating manual described in paragraph 1.5.1, if one is carried.

1.5.3 Fishing vessels should take account of the distance from search and rescue facilities.

1.5.4 In order to establish procedures or operational limitations, an assessment should be made of fishing vessels intending to operate in polar waters, and their equipment. This assessment could be undertaken by the operator or shipowner to ensure that such fishing vessels are fit for the intended purpose. The assessment might consider the following:

- .1 the anticipated range of operating and environmental conditions, such as:
  - .1 operation in low air temperature;
  - .2 operation in ice;
  - .3 operation in areas, and during periods, where ice accretion is likely to occur;
  - .4 operation in high latitude; and
  - .5 potential for abandonment onto ice or land; and
- .2 hazards which may potentially occur in polar waters, as listed in section 3 of the introduction to these Guidelines.

## **1.6 Documentation**

1.6.1 It is recommended that a supplementary operating manual containing information directly relevant to operations in polar waters is carried on board. The supplementary manual is intended to provide persons on board with sufficient information regarding the vessel's operational capabilities and limitations in order to support their decision-making process. The supplementary manual might include the type of information and procedures suggested below. Not every issue on the list will be applicable to every fishing vessel. Vessels that undertake occasional or limited polar voyages would not need to have procedures in place for situations of very low probability of occurrence.

1.6.2 Information in such a supplementary manual for operations in polar waters might include:

- .1 details of the vessel's specific capabilities and operating limitations relevant to normal operations and to anticipated ice conditions and temperatures, including:



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- .1 systems susceptible to damage or loss of functionality by exposure to low temperatures and measures to avoid malfunction;
  - .2 information on limitations on vessel endurance such as fuel tankage, freshwater capacity, provisions stores, etc.; and
  - .3 information on the icing allowance included in the stability calculations;
- .2 operating procedures to be followed in normal conditions and in order to avoid encountering ice conditions that exceed the vessel's capabilities;
  - .3 procedures to be followed in the event of incidents in polar waters, including evacuation procedures and damage control;
  - .4 procedures for checking the integrity of hull structure in polar conditions;
  - .5 special measures to maintain equipment and system (especially communications and navigational) functionality under low temperatures, topside icing and the presence of sea ice, as applicable;
  - .6 description and operation of fire detection and fire-extinguishing equipment in a polar environment;
  - .7 guidance on how to prevent or mitigate icing by operational means, how to monitor and assess ice accretion, how to conduct de-icing using available equipment and how to maintain safety of the vessel and persons on board during all of these aspects of the operation;
  - .8 guidance on how to monitor, prevent or mitigate ice ingestion by seawater systems when operating in ice or in low water temperatures;
  - .9 procedures for voyage planning to avoid ice and/or temperatures that exceed the vessel's design capabilities or limitations;
  - .10 procedures to mitigate risk in adverse ice conditions, including:
    - .1 guidance on the use of low speeds in the presence of hazardous ice;
    - .2 procedures for enhanced watchkeeping and lookout crewing in situations with high risks from ice, e.g. in proximity to icebergs, operation at night and other situations of low visibility; and
    - .3 where possibilities for contact with hazardous ice exist, procedures should address regular monitoring, e.g. soundings or inspections of compartments and tanks below the waterline;
  - .11 procedures to establish requirements for supplies and appropriate safety levels for safety margins, taking into account various scenarios, e.g. slower than expected steaming, course alterations, adverse ice conditions, places of refuge and access to provisions. Sources for, and availability of, fuel types should be established, taking into account long lead times required for deliveries;

- .12 guidance for human resources management, taking into account anticipated ice conditions and requirements for ice navigation, increased levels of watch keeping, hours of rest, fatigue and a process that ensures that these procedures are met;
- .13 arrangements for receiving forecasts of the environmental conditions, including appropriate ice and weather information;
- .14 arrangements for addressing any limitations of the hydrographic, meteorological and navigational information available;
- .15 procedures to increase the effectiveness of emergency response measures where hazards specific to the polar environment are likely to be encountered;
- .16 details for contacting emergency response providers for salvage, search and rescue (SAR), spill response, etc.; and
- .17 procedures for maintaining life support and vessel integrity in the event of prolonged entrapment by ice.

## **CHAPTER 2**

### **CONSTRUCTION AND WATERTIGHT INTEGRITY**

#### **Purpose**

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

#### **2.1 General**

2.1.1 The structure should be designed to resist both global and local loads anticipated under expected ice conditions.

2.1.2 Structural arrangements should aim to limit damage resulting from accidental overloads to local areas.

#### **2.2 Materials**

2.2.1 For fishing vessels intended to operate in low air temperature, materials used should be suitable for operation at the vessel's PST.

2.2.2 Abrasion and corrosion-resistant coatings and claddings used in ice-strengthened areas should be matched to the anticipated loads and structural response.

#### **2.3 Weathertight integrity**

2.3.1 All closing appliances and doors relevant to watertight and weathertight integrity should be operable in polar conditions.

2.3.2 When operating in areas and during periods where ice accretion is likely to occur, means should be provided to remove or prevent ice and snow accretion around hatches and doors.

2.3.3 If the hatches or doors are hydraulically operated, means should be provided to prevent freezing or excessive viscosity of liquids.

2.3.4 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 persons wearing heavy winter clothing including thick mittens.

## **2.4 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 recognized organization or competent body.

# **CHAPTER 3 STABILITY**

## **Purpose**

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

## **3.1 General**

Account should be taken of the effect of icing in the stability calculations in accordance with the International Code on Intact Stability, 2008 (2008 IS Code).

## **3.2 Stability in intact conditions**

3.2.1 The supplementary manual, if carried (see 1.6.1), should include information on the icing allowance included in the stability calculations.

3.2.2 Ice accretion should be monitored and appropriate measures taken to ensure that the ice accretion does not exceed the values given in the supplementary manual, if carried.

3.2.3 For each standard loading condition, vessels should be shown by design calculations to meet the intact stability criteria of part B, 2.1 of the 2008 IS Code.

## **3.3 Stability in damaged conditions**

Consideration should be given to vessel stability in damaged conditions, taking into account the type of vessel, the intended service and area of operation.

# **CHAPTER 4 MACHINERY AND ELECTRICAL INSTALLATIONS**

## **Purpose**

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

## **4.1 General**

4.1.1 The design, rating, installation, operation and maintainability of all onboard machinery and equipment should be suitable for operation and navigation in polar waters and the harsh weather conditions that often occur. Factors to be taken into account include:

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

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

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

4.1.3 Materials used for machinery and electrical installations should be suitable for operation at the vessel's PST. In particular, machinery and electrical installations which are essential for the safe operation when:

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

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

4.1.4 For vessels intended to operate in ice-covered waters, machinery and electrical installations should provide functionality under the anticipated environmental conditions, taking into account loads imposed directly by ice interaction.

4.1.5 The layout and construction of machinery essential for the safe operation of the fishing vessel should be such that repairs which can be effected using the resources on board may be completed safely and effectively.

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

## **4.2 Main propulsion systems**

4.2.1 The main propulsion machinery should be designed and protected against the effects of the anticipated 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.

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

- .1 designed for loads and vibrations resulting from propeller/hull/rudder-ice interactions;
- .2 located to provide protection from freezing spray, ice and snow;

- .3 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
- .4 designed to be protected from a direct hit by ice.

4.2.3 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 anticipated operational conditions.

4.2.4 Piping and intake systems associated with the main propulsion plant and auxiliary machinery essential to the propulsion system should be designed to withstand frost so as not to be affected by the impact of the polar environment.

### **4.3 Auxiliary machinery systems**

4.3.1 Equipment and systems should be designed so that exposure of persons on board to cold temperatures and other environmental hazards during normal operations including routine maintenance is minimized.

4.3.2 Essential equipment or systems required for safe operation, located within spaces which, upon failure of the primary heating system, could be subject to outside ambient air temperatures should be:

- .1 provided with an independent source of heat; and
- .2 fabricated from materials that are not susceptible to brittle fracture under the anticipated loads and temperatures.

### **4.4 Directional control systems**

4.4.1 Directional control systems, if fitted, should be of adequate strength and suitable design to enable efficient operation in polar waters.

4.4.2 Where interaction between the vessel's directional control systems and propulsion systems occurs or where dual purpose components are fitted, the provisions of this chapter relating to propulsion systems should also be followed.

### **4.5 Electrical installations**

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

4.5.2 For vessels intended to operate in ice-covered waters, precautions should be taken to minimize risk of supplies to essential and emergency services being interrupted by the inadvertent or accidental opening of switches or circuit breakers due to vibrations or accelerations during icebreaking operations.

4.5.3 Emergency power batteries including the reserve source of energy for the radio installation, including those stored in deck boxes, 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.

4.5.4 Control systems based on computers and other electronic hardware installations necessary for the proper functioning of essential equipment should be designed for redundancy and resistance to vibration, dampness and low humidity.

## **CHAPTER 5**

### **FIRE PROTECTION, FIRE DETECTION, FIRE EXTINCTION AND FIRE FIGHTING**

#### **Purpose**

This chapter sets out standards for fire safety systems and appliances on fishing vessels to ensure they are effective and operable in polar conditions and that means of escape remain available so persons on board can safely and swiftly escape under the expected environmental conditions.

#### **5.1 General**

5.1.1 Components of fire safety systems and appliances should be designed to ensure availability and effectiveness under PST.

5.1.2 Components of the fire-fighting system and appliances which may be exposed to ice and snow accumulation that could interfere with the proper functioning of that component should be adequately protected.

5.1.3 Local equipment and machinery controls should be arranged so as to avoid freezing, snow accumulation and ice accretion and to remain accessible at all times.

5.1.4 Fire safety systems and appliances should be capable of being operated normally by persons wearing bulky and cumbersome polar clothing.

5.1.5 Means should be provided to remove or prevent ice and snow accretion from accesses.

5.1.6 Extinguishing media should be suitable for the intended operation.

#### **5.2 Ventilation**

Closing apparatus for ventilation inlets and outlets should be designed and located to protect them from ice or snow accumulation that could interfere with the effective closure of such systems.

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

5.3.1 Fire-extinguishing systems should be designed or located so that they are not made inaccessible or inoperable by ice or snow accumulation or low temperature such that:

- .1 equipment, appliances, systems and extinguishing agents should be protected from freezing for the intended voyage;
- .2 precautions should be taken to prevent nozzles, piping and valves of any fire-extinguishing system from becoming clogged by impurities, corrosion or ice build-up; and
- .3 exhaust gas outlets and pressure vacuum arrangements should be protected from ice build-up that could interfere with effective operation.

5.3.2 Water or foam extinguishers should not be located in any position that is exposed to freezing temperatures. These locations should be provided with extinguishers capable of operation under such conditions.

#### **5.4 Fire pumps and associated equipment**

5.4.1 Where a fixed water-based fire-extinguishing system or an alternative fire-extinguishing system situated in a space separate from the compartment containing the main fire pumps utilizes its own independent sea suction, this sea suction should be capable of being cleared of ice accumulation.

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

5.4.3 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 means of draining exposed sections should be provided.

5.4.4 Hydrants should be positioned or designed to remain operable under all anticipated temperatures. Ice accumulation and freezing should be taken into account.

5.4.5 All hydrants should be equipped with an efficient two-handed valve handle.

5.4.6 In addition, for fishing vessels intended to operate in low air temperature, portable and semi-portable extinguishers should be located in positions protected from freezing temperatures, as far as practical. Locations subject to freezing should be provided with extinguishers capable of operation under PST.

#### **5.5 Firefighters' outfits**

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

## **CHAPTER 6 PROTECTION OF PERSONS ON BOARD**

### **Purpose**

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

### **6.1 General**

6.1.1 Particular care should be taken to ensure that decks are designed or treated so as to minimize the possibility of slipping in icy deck conditions.

6.1.2 Fishing vessels should have sufficiently available and reliable facilities to maintain a life sustaining environment in the event of an emergency and/or of extended ice entrapment.

## **6.2 Bulwarks, rails and guards**

Particular care should be taken to ensure that the bulwarks or guard rails that are to be fitted on all exposed parts of the working deck and on superstructure decks if they are working platforms should be designed so as to provide adequate protection of persons on board in the harsher weather conditions that can occur in polar regions.

## **6.3 Stairways and ladders**

All stairways and ladders should be dimensioned so as not to hinder passage for persons wearing suitable polar clothing.

## **6.4 Other safety measures**

Accommodation should be designed and arranged to protect the occupants from unfavourable environmental conditions and minimize risk of injury during normal (including ice transiting or icebreaking) operations and emergency conditions.

## **6.5 Means of escape**

6.5.1 Means of escape from accommodation or interior working spaces should not be rendered inoperable by ice accretion or by malfunction due to low external ambient air temperatures.

6.5.2 Escape routes should remain accessible and safe, taking into consideration the potential icing of structures and snow accumulation. They should be of a dimension so as not to hinder passage for persons wearing suitable polar clothing.

6.5.3 All means of escape from accommodation or interior working spaces in the case of fire should be in accordance with the relevant provisions relating to fire safety in chapter 5 of these Guidelines.

# **CHAPTER 7 LIFE-SAVING APPLIANCES AND ARRANGEMENTS**

## **Purpose**

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

## **7.1 General**

7.1.1 Fishing vessels should carry life-saving appliances and survival equipment suited to the polar environment.

7.1.2 All survival craft, rescue boats, appliances and associated equipment and survival equipment should be designed so as to remain functional under the possible adverse environmental conditions during the maximum expected time of rescue.

7.1.3 All survival craft and rescue boats should be designed so as to provide effective protection against possible adverse environmental conditions including direct wind chill, for all on board.



7.1.4 All survival craft, rescue boats, life-saving appliances and associated equipment and survival equipment should take account of potentially long operation periods in darkness, taking into consideration the intended voyage.

7.1.5 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 immersion in polar water.

7.1.6 Survival craft should have sufficient space to accommodate persons equipped with polar clothing suitable for the environment.

7.1.7 Survival craft should carry equipment, appropriate for use in polar conditions, to communicate with rescue assets.

7.1.8 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.

7.1.9 Insulated immersion suits should be carried.

7.1.10 Training in the use of emergency equipment, as appropriate, and training on action to take in an emergency, should be included as an element of the operating procedures and drills described in chapter 8.

## **7.2 Embarkation into survival craft**

7.2.1 Embarkation arrangements should not hinder passage by persons wearing suitable polar clothing.

7.2.2 Embarkation arrangements should be adequate to ensure the safety of persons on board, taking into consideration the possible adverse environmental conditions during an emergency.

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

## **7.3 Lifeboats**

7.3.1 All lifeboats should be either of the partially or totally enclosed type to provide adequate shelter from the anticipated operating environment.

7.3.2 The capacity of lifeboats should be evaluated with regard to operability, accessibility, seating capacity and overall space, considering the needs of personnel wearing suitable polar clothing.

7.3.3 Any ice accretion should be regularly removed from the lifeboats, launch area and launching equipment to ensure readiness for launching when required. An icing removal mallet should be available in the vicinity of the lifeboats.

7.3.4 All lifeboat engines should be equipped with a means to ensure they start readily when required at the MDLT.

7.3.5 The lifeboat engine fuel oil should be suitable for operation in the minimum anticipated operating temperature.

7.3.6 For vessels intended to operate in extended periods of darkness, searchlights suitable for continuous use to facilitate identification of ice should be provided for each lifeboat.

7.3.7 Lifeboats and containers for group survival equipment in their stowed position should have means to mitigate the freezing of drinking water supplies.

## 7.4 Liferafts

7.4.1 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 icing removal mallet should be available in the vicinity of the liferafts.

7.4.2 Fishing vessels should carry inflation pumps that are proven to be effective in PST in a warm space in the vicinity of the liferafts' manual.

7.4.3 Air or other proven cold temperature gas should be used for the inflation of life-saving equipment according to their environmental conditions of operation.

## 7.5 Additional survival kits for polar conditions

7.5.1 Sufficient personal and group survival kits should be carried to cover at least 110% of the persons on board the vessel.

7.5.2 Personal survival kits (PSK) should be carried whenever a voyage is anticipated to encounter mean daily temperatures below 0°C.

7.5.3 PSKs should be stored so that they may be easily retrieved in an emergency situation. Arrangements such as storage in dedicated lockers near the assembly station(s) may be considered.

7.5.4 Persons 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.

7.5.5 Suggested contents of a PSK are listed in table 7.1.

**Table 7.1: Sample of items for inclusion in a personal survival kit**

<b>Suggested equipment</b>
Protective clothing (hat, gloves, socks, face and neck protection, thermal underwear, etc.)
Skin protection cream
Insulated immersion suit
Handwarmers
Sunglasses or goggles
Whistle
Signal mirror

<b>Suggested equipment</b>
Personal Locator Beacon
Drinking mug
Emergency food
Penknife
Handbook (Polar Survival)
Carrying bag

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

7.5.7 GSKs should be stored so that they may be easily retrieved 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.

7.5.8 Suggested contents of a GSK are listed in table 7.2.

**Table 7.2: Sample of items for inclusion in a group survival kit**

<b>Suggested equipment</b>
Shelter – tents or storm shelters or equivalent – sufficient for maximum number of persons
Foam sleeping mats or similar – sufficient for at least one between two persons
Sleeping bags – sufficient for at least one between two persons
Shovels – at least 2
Sanitation (e.g. toilet paper)
Stove and fuel – sufficient for maximum number of persons ashore and maximum anticipated time of rescue
Emergency food – sufficient for maximum number of persons ashore and maximum anticipated time of rescue
One first aid kit in a waterproof case
Flashlights – one per shelter
Waterproof and windproof matches – two boxes per shelter
Whistle
Signal mirror
Emergency Position Indicating Radio Beacon
Appropriate communications equipment, separate from that carried on the vessel or survival craft

<b>Suggested equipment</b>
Water containers and water purification tablets
Spare set of personal survival equipment
Snow saw and snow knife
Tarpaulin
Group survival equipment container (waterproof and floatable)

7.5.9 PSK and GSK inspections should be carried out no less frequently than on an annual basis.

7.5.10 Where PSK and/or GSK are fitted, consideration should be given to providing additional kits for training and demonstration purposes.

## **CHAPTER 8 EMERGENCY PROCEDURES, MUSTERS AND DRILLS**

### **Purpose**

This chapter sets out standards to ensure that persons on board fishing vessels are adequately trained and familiar with emergency procedures, their duties, musters and drills specific to an emergency in polar waters.

### **8.1 General**

Emergency drills should be carried out on a regular basis.

### **8.2 Onboard instruction for emergency operations**

8.2.1 Instructions for drills and emergency instructions as detailed in this section should be incorporated as annexes to the training manual referred to in paragraph 11.5.6.

8.2.2 Onboard instructions for the operation of life-saving, fire and damage control appliances and systems should include appropriate cross training of crew members with appropriate emphasis to changes to standard procedure made necessary by operations in polar waters.

8.2.3 All personnel should be given instructions which might include:

- .1 awareness of problems of cold shock, snow blindness, sun burn, hypothermia, first-aid treatment of hypothermia and other appropriate first-aid procedures; and
- .2 special instructions necessary for use of life-saving appliances in severe weather and severe sea conditions on the ice or in a combination of water and ice cover.

### **8.3 Abandon ship drills**

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

8.3.2 The abandon ship drills could include:

- .1 checking that all personnel are suitably dressed;
- .2 donning of immersion suits and thermal protective clothing;
- .3 testing of emergency lighting for assembling and abandonment; and
- .4 giving instructions in the use of life-saving appliances and in survival at sea, on the ice or a combination of both, as appropriate.

### **8.4 Rescue boat drills**

Rescue boat drills, if a rescue boat is on board, should be conducted as far as is reasonable and practicable with due consideration of the dangers of launching into ice-covered waters.

### **8.5 Fire drills**

8.5.1 Fire drills should be varied so that emergency conditions are simulated for different compartments of the vessel, with appropriate emphasis on those changes to standard procedures made necessary by operations in polar waters and low temperatures.

8.5.2 Fire drills should include elements made necessary by operation in a polar environment.

### **8.6 Damage control drills**

Damage control drill scenarios should be varied so that emergency conditions are simulated for different damage conditions with appropriate emphasis to those conditions resultant from operations in polar waters.

## **CHAPTER 9 RADIOCOMMUNICATIONS**

### **Purpose**

This chapter provides standards for effective communication for fishing vessels and survival craft in polar waters during normal operation and in emergency situations.

### **9.1 General**

9.1.1 Communications equipment should be suitable to provide adequate ship-to-ship and ship-to-shore communication at all points along the intended operating routes, taking into account the limitations of communications systems in high latitudes and the anticipated low temperature.

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

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

9.1.4 Appropriate communication equipment to enable telemedical assistance in polar areas should be provided.

9.1.5 Emergency power for communications equipment provided by battery should be provided with a means whereby the batteries are protected from extreme low temperatures.

## **9.2 Survival craft and rescue boat communications capabilities**

9.2.1 For fishing vessels intended to operate in low air temperature, all rescue boats and lifeboats, whenever released for evacuation, should maintain capability for distress alerting, locating and on-scene communications.

9.2.2 For fishing vessels intended to operate in low air temperature, all other survival craft, whenever released, should maintain capability for transmitting signals for location and on-scene communications.

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

## **CHAPTER 10 SHIPBORNE NAVIGATIONAL EQUIPMENT AND ARRANGEMENTS**

### **Purpose**

This chapter provides for safe navigation in polar waters.

### **10.1 General**

10.1.1 Taking account of the fact that use in high latitudes may affect their performance, navigational equipment and systems for providing reference headings and position fixing should be designed, constructed, and installed to retain their functionality under the expected environmental conditions in the intended area of operation.

10.1.2 Fishing vessels should have means of receiving and displaying current and forecasted information on ice conditions in the intended area of operation.

10.1.3 Sensors, antennas and other navigational equipment should be protected from ice accretion.<sup>3</sup>

### **10.2 Additional navigational equipment for operations in polar waters**

10.2.1 Fishing vessels should be fitted with two non-magnetic means to determine and display their heading.

10.2.2 Fishing vessels should be fitted with at least one appropriate speed and distance measuring system.

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<sup>3</sup> See also *Guidance for navigation and communication equipment intended for use on ships operating in polar waters* (MSC.1/Circ.1612).

10.2.3 Fishing vessels should be fitted with 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.

10.2.4 Fishing vessels should be fitted with a total of at least two functionally independent radar systems. One of these should operate in the 3 GHz (10 cm, S-band) frequency range.

10.2.5 The use of radars equipped with enhanced ice detection capability is recommended.

10.2.6 Radar plotting systems that may be installed should have the capability of operating in both the sea and the ground-stabilized mode.

10.2.7 A Global Navigation Satellite System (GNSS) (GPS or GLONASS or equivalent) should be fitted on any vessel intending to navigate in areas outside of reliable coverage by a terrestrial hyperbolic system.

10.2.8 Fishing vessels should be provided with automatic identification system (AIS).

10.2.9 Separate rudder angle indicators should be provided for each rudder on fishing vessels with more than one independently operable rudder.

10.2.10 Fishing vessels should be equipped with suitable searchlights.

10.2.11 The searchlights described in paragraph 10.2.10 should be installed to provide, as far as is practicable, all-round illumination suitable for berthing, astern manoeuvres or emergency towing; and should be fitted with an adequate means of de-icing to ensure proper directional movement.

10.2.12 Fishing vessels should be fitted with a suitable means to de-ice sufficient helm position windows to provide sufficient watchkeeping capability.

10.2.13 All indicators providing information to the helm positions should be fitted with means of illumination control to ensure readability under all operating conditions.

### **10.3 Vision enhancement equipment**

10.3.1 The windows described in paragraph 10.2.12 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 impair effective operation.

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

### **10.4 Navigating from chart information in polar waters**

10.4.1 As the chart coverage of polar waters in many areas may not currently be adequate for coastal navigation, navigational officers should:

- .1 exercise care to plan and monitor their voyage accordingly, taking due account of the information and guidance in the appropriate nautical publications;

- .2 be familiar with the status of hydrographic surveys and the availability and quality of chart information for the areas in which they intend to operate;
- .3 be aware of potential chart datum discrepancies with GNSS positioning; and
- .4 aim to plan their route through charted areas and well clear of known shoal depths, following established routes whenever possible.

10.4.2 Any deviations from the planned route should be undertaken with particular caution. For example, and when operating on the continental shelf:

- .1 the echo-sounder should be monitored to detect any sign of unexpected depth variation, especially when the chart is not based on a full search of the sea floor; and
- .2 independent cross-checking of positioning information (e.g. visual and radar fixing and GNSS) should be undertaken at every opportunity. The skipper or navigational officer should ensure to report to the relevant charting authority (Hydrographic Office) any information that might contribute to improving the nautical charts and publications.

## **CHAPTER 11 OTHER SAFETY MEASURES**

### **Purpose**

This chapter sets out additional measures to improve the safety of fishing vessels and their personnel.

### **11.1 Anchoring and towing arrangements**

11.1.1 Fishing vessels should, as far as is 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.

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

11.1.3 As far as is practical, fishing vessels should be capable of anchoring and providing limited assistance in the case of debilitating damage or breakdown, towards the prevention of a catastrophic loss or incident. 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.

11.1.4 Fishing vessels designed to perform dedicated towing operations should be equipped with line-throwing apparatus in addition to that required for life-saving. This apparatus should be capable of delivering messenger lines for the transfer of towing equipment. Such line throwing apparatus should not be of the powder or rocket type in order that it may be safely used to make a transfer to a tanker.

11.1.5 Fishing vessels designed to perform dedicated towing operations should be provided with a quick-release system, operable from the conning position.



11.1.6 Where fitted, close-coupled bow to stern towing arrangements should comprise strengthened bow plating on the towed vessel, appropriate towing slings, non-interfering positioning of bower anchors and disallowance of bulbous bows. If required, arrangements should be provided for securing the anchor in the stowed position.

11.1.7 Fishing vessels should be capable of receiving emergency towing assistance.

11.1.8 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.

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

Refuelling of fishing vessels should be carried out while taking into account the special conditions imposed by low temperatures and ice conditions, where applicable.

## **11.3 Emergency equipment**

11.3.1 Fishing vessels should be provided with an adequate number of first aid kits and equipment with contents suitable to the onboard location and the recognized provisions for personnel safety hazards of such locations.

11.3.2 Medical equipment, medicines and facilities should be considered with a view to the nature of the voyage, vessel operations and the ability to communicate and obtain timely medical aid, medical evacuation or other medical assistance.

11.3.3 Crews should be provided with appropriate equipment and training to safely evacuate an individual in a medical emergency from the vessel.

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

11.3.5 Vessels operating in remote areas should give special consideration to carrying spare parts and equipment.

11.3.6 Fishing vessels should consider carrying the following emergency equipment:

- .1 portable gas welding and cutting equipment with a reserve of consumables; and
- .2 portable electro-submersible pump of 100 m<sup>3</sup>/h capacity, with a set of hoses.

## **11.4 Crewing**

11.4.1 Arrangements for crewing should take account of the relative lack of shore and support infrastructure which may be available to assist in any operations.

11.4.2 Arrangements for crewing should take account of anticipated ice conditions and requirements for ice navigation, increased levels of watchkeeping and the effect this has on hours of rest and fatigue.

## **11.5 Training**

11.5.1 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 in order to ensure that vessel personnel operate safely in conditions specific to polar waters.

11.5.2 As a minimum, all persons on board should be made familiar with cold weather survival by training or self-study of course material or publications, addressing, in particular, the measures described in section 8.3.

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

11.5.4 Officers in charge of a navigational watch should have appropriate training and/or experience in recognizing navigational dangers specific to polar ice-covered waters.

11.5.5 All persons on board should be made familiar with the relevant procedures and equipment in the supplementary manual for operations in polar waters referred to in section 1.5, should one be carried.

11.5.6 In addition to the supplementary manual for operations in polar waters referred to in paragraph 1.4.1 and section 1.5, fishing vessels should consider carrying a training manual covering relevant aspects of operations in polar waters. Information contained in the manual might include:

- .1 these Guidelines;
- .2 ice recognition;
- .3 navigation in ice; and
- .4 escorted operation.

## **11.6 Voyage planning**

When planning a route through polar waters, in order to avoid potential hazards, the skipper of the fishing vessel should be taking into account the following factors:

- .1 the procedures described in the supplementary manual for operations in polar waters referred to in section 1.5, should one be carried;
- .2 any limitations of the hydrographic information and aids to navigation available;
- .3 current information on the extent and type of ice and icebergs in the vicinity of the intended route;
- .4 statistical information on ice and temperatures from former years;
- .5 places of refuge;
- .6 current information and measures to be taken when marine mammals are encountered relating to known areas with densities of marine mammals, including seasonal migration areas;<sup>4</sup>
- .7 current information on relevant routing systems, speed recommendations and vessel traffic services relating to known areas with densities of marine mammals, including seasonal migration areas;
- .8 national and international designated protected areas along the route; and
- .9 operation in areas remote from SAR capabilities.

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<sup>4</sup> Refer to *Guidance document for minimizing the risk of ship strikes with cetaceans* (MEPC/Circ.674).