



BRITANNIA LOSS PREVENTION

# B GUIDANCE

DECEMBER 2023

## OPERATING IN ICY CONDITIONS

OPERATING SHIPS IN ICY CONDITIONS REQUIRES A UNIQUE SET OF SKILLS AND PRECAUTIONS TO ENSURE THE SAFETY OF BOTH THE SHIP AND CREW.

To thoroughly prepare ships, crew, and cargo for extreme cold conditions, it is strongly recommended that classification societies, flag and coast states, equipment manufacturers, H&M insurers, training facilities, and other relevant stakeholders are consulted with.

It's important to note that this guidance offers high-level, generic information and should not be considered exhaustive.

## PUBLICATIONS

THE INTERNATIONAL MARITIME ORGANIZATION (IMO) POLAR CODE ENTERED INTO FORCE ON 1 JANUARY 2017. THE ARTIC POLAR WATERS FOR WHICH THE POLAR CODE APPLIES ARE DEFINED IN SAFETY OF LIFE AT SEA (SOLAS) CHAPTER XIV.

Shipowners should not operate in areas where the Polar Code applies unless their ship is certified in accordance with its provisions. Even where not applicable, the provisions of the Polar Code may still be helpful and used as guidance when developing shipowners procedures for operating in extreme cold areas.

The Oil Companies International Marine Forum (OCIMF) and the International Chamber of Shipping (ICS) have published the [Guidelines for the Development of a Polar Water](#)

[Operational Manual](#) which provides advice on how to prepare an operational manual in accordance with the Polar Code.

The American Bureau of Shipping (ABS) [Guide for Vessels Operating in low Temperature Environments](#) provides more detailed operational and technical advice that could be taken into consideration. However, a ship's own classification society should also be consulted.

The flag state of the ship should also be consulted to determine whether they have any special requirements for ships trading in extreme cold environments.

## RISK ASSESSMENT

**BEFORE SHIPOWNERS TRADE IN THESE HARSH ENVIRONMENTS, A COMPREHENSIVE RISK ASSESSMENT SHOULD BE COMPLETED.**

This should be accompanied by a Gap Analysis and action plan to ensure that necessary safety barriers are implemented to efficiently mitigate all identified risks. This may include procedural amendments, structural modifications and additional training. The Risk Assessment should consider the following (not to be deemed exhaustive):

### EXPECTED ICE CONDITIONS

The crew needs to receive up to date weather information, including details on the extent of ice development in the area. Subsequently, the crew should be capable of analysing the information to then comprehend the progression of the ice development and assess how current weather conditions might impact it.

To determine the operational boundaries of the ship when navigating near ice, it is important to consult with the ship's classification society. Shipowners' operational procedures must address decisions around ice conditions and if they surpass the ship's design, emphasising the Master's ultimate authority.

### LOCAL REQUIREMENTS

The crew must be adequately informed of all local requirements that apply. This includes the need for ice breaker assistance in certain winter periods, restrictions on docking/undocking during darkness and any additional equipment that may be required during ice passages, such as search lights. Additionally, the ship should have any local guides or other publications for navigating in ice and/or operating in extreme cold areas on board.

## MANOEUVRING

Consideration should be given to the impact surrounding drifting ice, bergy waters and between floes. Astern manoeuvres in ice exposes the most vulnerable parts of the ship and should therefore be given extra consideration before attempted. Shipowners' operational procedures should contain guidance for manoeuvring in, or in the proximity of hazardous ice. The guidance should consider: entering an ice edge, the safe speed for various grades of ice conditions, the use of the rudder, and its influence on the turning circle of the ship.

## NAVIGATION

When navigating in or near ice, it is advisable to have an additional lookout or navigator to assist the duty officer. Detecting ice can be challenging, especially in the dark, and search lights may be required. Adjusting radar settings is important, as ice may make a poor radar target.

The ship's passage planning should adhere to IMO Resolution [A. 893\(21\) Guidelines For Voyage Planning](#). The presence of sea ice along the planned route emphasises the importance of traditional passage planning, requiring continuous review throughout the voyage.

The publication [Ice Navigation in Canadian Waters](#) section 4.10 offers guidance on planning passages in areas with ice, which can also be applied in non-Canadian waters, especially in the absence of local guidance.

## STABILITY

Adherence to the IMO Stability Criteria is essential, with particular attention given to the risk of superstructure icing, which could compromise the stability of the ship. Superstructure icing is influenced by various factors such as meteorological conditions, condition of loading, and behaviour of the ship in stormy weather. The Ice Navigation in Canadian Waters section 4.3.1 provides further advice on icing and precautions to minimise the development of superstructure icing.

## CARGO CARE

Attention should be given to the correct ventilation of the cargo during voyage, applying the commonly used practices of the Dew Point or Three Degree Rule. The cargo hold ventilation system should be able to operate in adverse weather conditions, considering potential snow or ice intake.

Consult the Classification Society and Maker to ensure that the hatch covers can be operated in low temperatures. All hatch cover securing components should be maintained to prevent jamming in cold weather. Hatch cover gaskets should be suitable

for extreme cold temperatures and prevent water from affecting their sealing ability. As a reminder, hose testing of hatch covers cannot be conducted in sub-zero temperatures. The ABS Guide for Vessels Operating in low Temperature Environments section 4.6 and 6.3 provides further guidance for Bulk Carriers.

## DECK/MACHINERY EQUIPMENT

Shipowners should ensure that all equipment is accessible and functional during the anticipated weather conditions and always consider the possibility of conditions being more severe than predicted. The equipment makers should be consulted to determine suitability of the equipment for cold weather and any special maintenance requirements. The classification society may also need to be consulted if any modifications are necessary.

Shipowners should include instructions in their operational procedures for preparing various equipment to withstand adverse cold weather conditions. These instructions should cover:

- Preparing navigation/communication equipment receivers, antennas and scanners
- Ensuring the readiness of mooring and anchoring systems
- Checking and preparing accommodation and pilot ladders
- Inspecting deck cranes
- Verifying the functionality of deck levers and valves
- Maintaining heat in store rooms
- Applying special polar resistant greasing to wires, davits and other moving parts that may require it
- Keeping air vents clear of ice accumulation
- Draining fresh water systems if necessary
- Checking and preparing hydraulic and electrical systems
- Ensuring ballast systems are functioning

Machinery instructions should include:

- Heating engine compartments
- Preventing ice development at the sea chest that could disrupt seawater intake to engine machinery
- Ensuring proper functioning of combustion engines by addressing low-temperature air intake issues
- Protecting batteries and other stored energy sources
- Maintaining the operational status of emergency generators and implementing precautions to prevent freezing of fuel and cooling water systems
- Draining domestic freshwater systems if necessary.

Section 2.5.3 of the Guidelines for the Development of a Polar Water Operational Manual by OCIMF and ICS provides more detail on areas to consider.

## FIREFIGHTING AND LIFE SAVING EQUIPMENT

Shipowners must ensure that all fire firefighting equipment remains operational and readily available. This includes implementing heating in areas where essential firefighting equipment, such as fire pumps and fireman's outfits, is stored to protect them from frost. Protection measures for the fire line should be in place to prevent any frost damage, including draining exposed sections when not in use. Regular testing of fire dampers is essential to confirm their operational status.

Lifesaving appliances must also be protected for full operational capability and accessibility. For lifeboats and rescue boats, a fuel capable of withstanding extreme low temperatures should be utilised, and engines must be able to start in extreme cold conditions. Consideration should be given to protecting essential survival equipment, such as water, food rations, and other necessities, from the impact of the cold climate. Maintenance of davits and launching appliances is crucial to prevent malfunctioning during low temperatures.

## PERSONAL SAFETY

Working in cold climates requires an understanding of the interplay between ambient temperature, wind speed, relative humidity, personnel protective equipment and the task at hand. All deck work activities, therefore, should be carefully planned and time outside should be limited to avoid any frost related injuries. The crew should be well-versed in wind chill and its affects on exposure, along with recommended outdoor working times at specific temperatures. The ABS Guide for Vessels Operating in low Temperature Environments offers guidance on these topics. Precautions to enhance personnel safety may include (but is not limited to):

- Carrying sufficient personal protection clothing suitable for extreme cold weather
- Keeping clothes dry; if exposed to water, change clothes
- Avoiding leaving any skin exposed
- Preventing bare skin from coming into contact with metallic objects
- Being aware of frostbites and hypothermia
- Working in pairs and keeping an eye out for each other

Arctic salt or sand should be used to provide safe passageways and prevent slip injuries. However, certain salts may impact coatings, so vendors should be consulted before use.

## TRAINING

Shipowners should provide necessary training to both the crew and applicable shoreside personnel to enable them to support the ship adequately. The identified training may encompass:

- Navigation and manoeuvring in or near ice. This should be provided by an accredited training facility and may include simulator based training
- Meteorological training to understand and analyse ice development
- Appropriate training for engineers to understand the impact extreme cold weather can have on machinery and how to mitigate associated risks
- First aid training for frost bite, hyperthermia or other cold weather related injuries
- Familiarisation training in systems or equipment specifically related to the safe operation of the ship in cold climates
- Understanding and practicing appropriate behaviour while working on deck, considering the impact of wind chill etc.

# SAFETY MANAGEMENT SYSTEMS

SHIPOWNERS SHOULD ENSURE THAT AN APPROPRIATE LEVEL OF OPERATIONAL SAFETY PROCEDURES AND CHECKLISTS ARE PROVIDED TO THE SHIP AND SHORESIDE PERSONNEL.

These should be developed when assessing the risk identified in the above Risk Assessment and provide clear instructions to the crew on preparing and safely operating the ship in extreme cold climates. Crew members must be familiar with these procedures, and their inclusion in the shipowner's internal audit program ensures proper implementation. It is essential for these protocols to undergo regular reviews and updates as needed.

By following the guidance above shipowners can help reduce the likelihood of claims and incidents when operating in icy conditions.

## FOR FURTHER INFORMATION

For further information, please do not hesitate to email [lossprevention@tindallriley.com](mailto:lossprevention@tindallriley.com).

## DISCLAIMER

THIS LOSS PREVENTION GUIDANCE ARTICLE IS PUBLISHED BY THE BRITANNIA STEAM SHIP INSURANCE ASSOCIATION EUROPE (THE ASSOCIATION).

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