№ W/N

JOINT STOCK COMPANY «PRIMORSK OIL TERMINAL»
(JSC «POT»)

APPROVED BY
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«28» 01 2026

GUIDANCE FOR NAVIGATION IN ICE CONDITION

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Preface

1 Developed by the Assistant General Director for Maritime Safety and Maritime Risk Management of Limited Liability Company Primorsk Trade Port (LLC PTP)

2 Approved by LLC «PTP»

3 DATE OF INTRODUCTION _____ 2026

4 INTRODUCED instead of the Recommendation for operation in ice conditions (in English) of LLC PTP dated 28.12.2009

5 Validity period - until replacement / cancellation

6 The original document is kept in the production and technical department of LLC «PTP».

7 Directions for application

Recommendations for safe operation of tankers on the approaches, in the port limit area, while anchoring at the inner road and berthing, during cargo operations in the port of Primorsk in period when ice navigation is announced. The recommendations are primarily intended for crews of tankers without ice class or with low ice class, deadweight of 30,000 tonnes and above, as well as crews of tankers without ice class but having an ice certificate. The document uses extracts from publication 'Use of Large Tankers during Ice Navigation and Severe Subzero Temperatures' by OCIMF.

'Severe sub-zero temperatures' refers to predicted average daily ambient temperatures below -15°C

Contents

Introduction

Independent navidation of tanker in ice conditions and navigation under icebreaker assisstans or convoy are concepts that may be relatively new to both shipowners and technical operators. Due to the changes in the tanker market, the export of crude oil and oil products by large-capacity tankers without ice or with low ice class from Baltic Sea ports, during the ice navigation period, has increased.

1 Scope

This document is intended as guidance to technical operators and shipowners (who operate or own or lease tankers) on the need to prepare the fleet for performing in the port of Primorsk during the winter navigation period.

The main aspects to be taken into account when preparing tankers for performing in low temperatures, when navigating independently in ice and/or behind an icebreaker assisstance are listed.

2 Regulatory references

The following regulatory references were used in the development of these Guidelines:

General rules of navigation and mooring of ships in the ports of the Russian Federation and approaches, approved by the Ministry of Transport of the Russian Federation No. 395 dated 12.11.2021.

International Safety Management Code - ISM Code.

Safety Guide for Oil Tankers and Terminals. International - ISGOT.

The Use of Large Tankers in Season Seasonal Ice Navigation and Severe Subzero Temperatures by OCIMF.

3 Designations and abbreviations

The following designations and abbreviations are used in this manual:

ISGOTT - International Safety Guide for Oil Tankers and Terminals;

OCIMF - Oil Company International Marine Forum;

ISN Code – International Safety Management Code;

MARPOL-73/78 - International Convention for the Prevention of Pollution from Ships 1973, as modified by its 1978 Protocol;

SOLAS-74 - International Convention for the Safety of Life at Sea.

4 Preparing for performing vessel in winter period

Chartering groups should ensure that ships intended for entering to Primorsk Oil terminal in extreme environments are capable and properly prepared. This includes the provision of adequate suitable equipment, preparations for equipment protection and procedures established to ensure safe operation and personnel welfare. The following list outlines areas that should be considered when preparing ships for operations involving low temperatures, ice navigation and/or icebreaker escort. It is recommended that operators produce a suitable checklist to cover these requirements.

«Primorsk Oil Terminal» after announcing the winter navigation, will send a Winterization questionnaire (Annex A) to tankers entring to port of Primorsk.

4.1 Ship's ice class

Ice class (Annex C) depends on the propulsion system, propeller material and hull strength. The ice class symbol does not apply to the readiness of the vessel to operate in low temperatures, when navigate in ice and/or in icebreaker convoy in terms of its commercial suitability.

4.2 Crew training

Captain and navigation officers shall undergo specialised simulator training for navigation in ice conditions. The Master, Chief Mate, Chief Engineer should have sufficient experience in ice and/or low temperature conditions. In the absence of adequate experience, a procedure for the use of an Ice advicer should be developed and implemented by the technical operator.

Vessel readiness for winter navigation should be reviewed and included in written operating procedures before the vessel will be sent to areas of sub-zero temperatures. This should be done well in advance to ensure that the crew has prepared the vessel for operation in sub-zero temperatures.

4.3 Equipment

Additionally, a windows heating system in the wheelhouse should be provided. Install searchlights - the number, method of control, power and location (important when sailing with an icebreaker) and it should be powerful, preferably 1,000 watts, and be located on each wing of the navigation bridge. Radars should be designed for use in sub-zero temperatures.

Systems for heating at least one of the seachests shall be provided. The material of the external hull plating shall meet the requirements for operation in sub-zero temperatures. The temperature in the living compartments shall be suitable for operation in areas with sub-zero temperatures. The ventilation systems (cargo and ballast tanks) shall comply with the requirements for winter operation.

4.4 Procedures

Ship preparation should be such that no aspect of safety is neglected when the ship is performing in sub-zero temperatures. An example a Risk Assessment (Annex B), provides detailed guidance on how to prepare a ship for operation during ice navigation and sub-zero temperatures.

5 Navigation of large tankers in ice

Large conventional tankers are normally designed for optimum performance in open water. This applies to designs for hull form, rudders and propellers. Large conventional parallel-sided tankers are relatively poor ice performers, for a number of reasons, including the following:

- in broken ice, they can be difficult to turn
- the available thrust can impact the ability to navigate in ice
- propellers designed for optimum open water performance may not be suited for delivering maximum thrust in ice
- propellers and rudders designed for open water operation may be more susceptible to ice impact damage.

Given the above, it is strongly recommended that the propeller is kept as deep as possible and it should always be deeper than the thickness of level ice to be navigated. If conventional tankers have to go astern in ice, the rudder should always be placed amidships. The speed of the ship should be controlled to reduce the risk of ice impact damage. Proceeding into ice at a safe speed is intended to prevent such damage.

The 'Ice Certificate' process assesses a ship's suitability to operate in ice conditions and considers the vessel's ice classification together with prevailing ice conditions and icebreaker assistance. The following aspects are considered when assigning an ice certificate:

- ice performance, including ice class
- speed and manoeuvrability characteristics in ice
- compressive strength of ship's side.

Large tankers may find that, once stopped in ice, regaining momentum is difficult without icebreaker assistance.

'Besetment', or getting stuck in ice, is a risk that the Captain of a large tanker should be aware of when navigating in ice. Ice under pressure can cause local forces on the ship's hull that may result in damage to plating or structure. The degree of threat depends on hull strength, ice thickness, ice properties and ice pressure. Inclined surfaces are less prone to ice pressure damage, hence a simple method of reducing the risk in such circumstances is to list the vessel.

The waterline paint systems of tankers may suffer heavy abrasion damage in ice. In addition, some impact deformation of hull plating is possible. The areas most likely to suffer hull plate deformation are the bow, bow shoulders, parallel mid body and aft shoulders.

Charterers may wish to consider arranging independent inspections of the hull before and after ice voyages.

Where a ship's officers and crew are not particularly experienced, the use of an Ice Advisor may be considered in order to supplement onboard knowledge.

6 Icebreaking of large-tonnage tankers

The icebreaker escort of large tankers is not a subject that can be easily condensed. However, for the purposes of this Briefing Paper it is considered useful to provide some basic information.

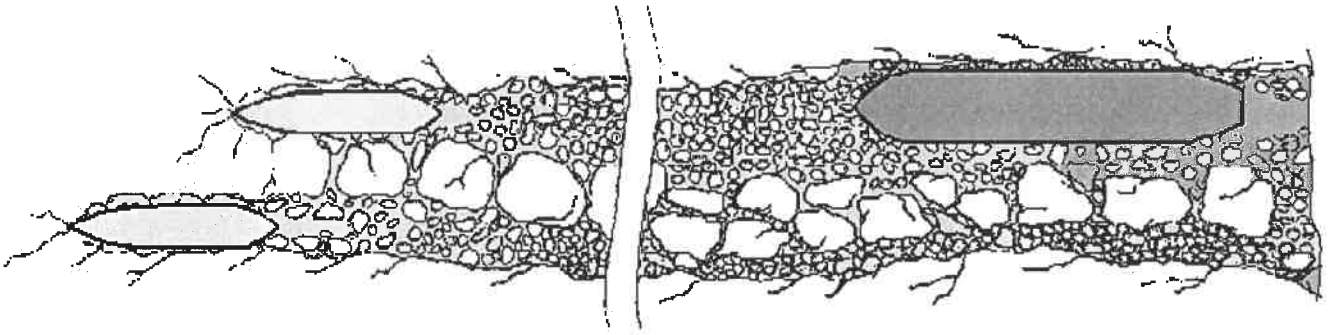
There are various different types, designs and sizes of icebreakers. Icebreakers used for escorting large tankers may be multifunctional or may have been designed with other prime or secondary purposes in mind. The world's icebreaker fleet is ageing and it is recognised that there is a shortage. Most escort systems work on the principle of providing icebreaker assistance only when necessary.

In general terms, large conventional tankers may require icebreaking assistance in anything more than thin unbroken ice. The ice channel required by large tankers will usually be wider than the beam of the tanker. Two icebreakers may be required for efficient escort. However, depending on the circumstances, single icebreaker escort is also possible.

There is a range of different large-ship icebreaker escort techniques in use depending, for example, on the ice conditions, preferred methods of the local icebreaker Captains and availability/design of icebreakers. Azimuth stern drive (ASD) icebreakers can break significantly wider ice channels than their beam by directing the azimuth thrust forwards and outwards. Conventional, high power icebreakers can achieve wider ice channels than their beam by breaking thin or medium thickness ice at high speeds of advance.

A common mode of large ship escort consists of two icebreakers in tandem (one ahead of the other) and separated by about 20 metres (depending on the beam of the tanker). This provides an ice channel approximately the width of the combined beams of both icebreakers plus the separation distance. The tanker travels at a "safe distance" behind the nearest icebreaker at a "safe speed" nominated by the icebreaker Captain who controls and manages the convoy. The tanker will encounter ice floes in the channel, as illustrated in the Figure 1.

Figure 1



7 Proficiency of ships' crew

It should be noted that the safe operation of a ship trading in ice requires skill and technical proficiency in excess of those required during normal operating conditions. It is, therefore, important that suitable training is offered to complement existing experience.

A ship's officers and crew should be adequately trained for circumstances likely to be encountered:

- operating in low temperatures;
- undertaking ice navigation and/or icebreaker escort.

This may take the form of simulator training, Computer-Based Training (CBT) or other acknowledged training methods.

It is recommended that the ship's officers and crew have experience of trading in ice and a suggested experience guide for key personnel is as follows in Table 1.

Table 1

№ п/п	Minimum Requirement	Ice Sailing Experience
1	2	3
1	Superintendent	2 seasons
2	Master	2 seasons
3	Chief Officer	1 season
4	Chief Engineer	1 season
5	1st Engineer	part season

When reviewing the experience and training of ship's officers, it is preferred that experience is gained in the rank that they are serving onboard, although it is recognised that this is not always achievable.

8 Winterisation of ships - considerations

Even if a vessel is ice-classed, it should be noted that some vessels may be subject to additional conditions, the fulfilment of which is mandatory when preparing the vessel for operation in sub-zero temperatures.

8.1 General

All void spaces, empty tanks, chain lockers and spaces should be sounded prior to entering cold weather. If any water is found, it should be educted dry, as far as is practical, to avoid ice damage when these residues freeze. The spaces should be regularly sounded to ensure that they remain water-free.

Sounding pipes, vents and remote gauges should be protected and remain operational as far is possible.

8.1.1 Valves

Hydraulic cargo valves on deck should be protected with canvas covers and the valves should be frequently activated while in sub-freezing temperatures to avoid freezing/blockage. Portable steam hoses and connections for the manifold areas are quite important. If any water is present in valve gear boxes, when frozen, it will inhibit the opening of the valve.

If any valves are left 'cracked' open to avoid fracturing of valve bodies, it is advisable to mark each open valve on a pipeline diagram.

8.1.2 Ballast tank ventilation system

Hydraulic ballast valves in empty tanks should be frequently activated to avoid freezing /blockage. As a minimum, twice a watch is recommended. Ballast tank vents may become frozen if not protected by canvas covers or steam heating on passage. However, this could lead to over or under pressurisation of ballast tanks. The use of covers on these vents should be strictly supervised to ensure that the covered vents can still operate as designed. It is recommended that covers are removed prior to the commencement of cargo operations. Frequent removal of any accumulated ice will be required.

8.1.3 Venting arrangements in cargo tanks

P/V valves should be thoroughly overhauled prior to entry into sub zero temperature area. Valves to be kept protected from ice accumulations on passage with canvas covers or

steam heating. In extreme low temperatures, canvas covers have been shown to be more effective than steam heating. Before any cargo operation commences, it is recommended that covers are removed and that pressure/vacuum arrangements are free of ice blockage. In particular, check that drain holes are clear and free to operate. The painting of Hi-Jet seat faces with anti-freeze will protect them from freezing in the shut position and will prevent an ice film forming.

8.1.4 IG deck seal (heating)

The deck water seal heating must be operational in freezing temperatures. It should be ensured that the inlet/outlet of sealing water is not frozen and/or blocked by ice. Frequent checks should be undertaken to confirm a positive water flow.

8.1.5 P/V Breakers – Liquid (anti-freeze)

The deck breaker should be filled with anti-freeze (Glycol as opposed to Methanol based) as per maker's instructions. Frequently checks should be undertaken to ensure the level is maintained. Once clear of the cold weather, the density of the P/V breaker will need to be tested and returned to the correct value necessary to ensure correct operation.

8.1.6 Mast Vent Riser (where fitted)

The mast vent riser valve needs to be protected with grease and a canvas cover. Flame arresters should be checked free of ice before the start of cargo operations. Prior to arrival, mast risers and inert gas (IG) lines should be drained of any liquid.

If fitted, auto and manual valves on the IG main line and tank inlets should be kept greased and protected with canvas covers. The operation of piston breather valves on IG lines should be checked before operations commence. Covers should be removed and de-icer sprayed in way of the valves.

It is recommended that the diameter of drainage lines on mast risers systems should be at least 52 mm.

8.1.7 FRAMO Style Hydraulic Systems

The grade of hydraulic oil used in the Framo pumps is satisfactory for air temperatures down to -25°C without causing any problems. If the oil temperature falls below -25°C, the heating v/v to the system should be opened. The FRAMO system should be started on low load

with forward warming through valve open, at least 30 minutes before the system is required for operations.

If the temperature of the hydraulic oil is less than -20°C, it must be heated before the pressure can be increased. This is achieved by running a power pack with minimum system pressure (60 Bar), and opening the bypass valve on the cargo main deck forward to circulate the oil. Once the temperature is above 20°C, the bypass valve is closed and the pressure can be increased to operational requirements. It should be ensured that the oil is warmed through in good time before mooring as it takes approximately one hour to increase the temperature by four degrees centigrade in freezing conditions.

It has been stated that some thickening of the hydraulic oil due to the increased viscosity will be experienced when ambient temperatures fall to zero and below. Minimising dead legs will assist in the pump's operation and, when starting the pump initially, it should be started very slowly to enable the warm hydraulic oil from the main to slowly displace the cold oil in the pump and consequently warm the pump through slowly. An increase in the normal loading may be placed upon the supply pump on starting a hydraulic pump due to the change in viscosity of the hydraulic oil.

8.1.8 Cargo pipework

Differences in temperature experienced by the ship can cause contraction of the deck lines that may not be taken up in the usual manner. There is a possibility of flange leakage and it would be prudent to check the integrity of the lines that are to be used to ensure they are tight for the forthcoming operation.

All cargo, ballast, tank cleaning and COW lines on deck should be well drained after pressure test or use. Particular attention should be paid to ballast systems, including ballast monitors and lines. After loading, discharging or bunkering in cold climates, ship's lines should be drained and drain valves left open until the ambient temperature rises sufficiently. Where possible, it is recommended that at least one tank filling valve is left open to allow the line to drain and preclude the possibility of the line becoming pressurised due to temperature changes.

The pour point of the cargo being carried or to be loaded should be checked to determine whether line blockages may occur if cargo operations are stopped for any reason. Similarly, bunker fuel specifications should be checked for pour point.

8.1.9 Pump rooms

Without compromising safety, pump room fans should be used only as required for ventilating the space to minimise the effect of sub-zero temperatures inside the pump room. Pump room doors should be kept closed, if possible.

Steam lines in the pump room, including those serving the tank-washing heater, should be drained down. The stripping pump, if fitted, may be kept warming if it is required to be ready for cargo operations or, alternatively, to provide some warmth in the pump room.

If fitted, pump room heaters should be turned on and, if provided on different floors, at least one on each floor should be used to promote convection currents in the space.

8.1.10 Ice accumulation in ballast tanks

Before entering cold climates, the Master should determine the density of the ballast water contained within the ballast tanks. The more saline the water is, the lower the freezing temperature will be. Consideration may be given to exchanging the ballast water to increase its salinity.

The surface of ballast water may freeze in ballast tanks. A considerable danger exists whereby during de-ballasting operations a layer of ice remains suspended in the tank, falling at a later time, causing damage to internal structure and fittings. If possible, ballast levels should be kept at or below the level of the sea surface (but also be aware of dangers of having sea suctions too close to sea surface getting blocked with sea ice).

Where fitted, ballast tank heating (or bubbling systems) must be in operation prior to entering areas with sub-zero temperatures, particularly when ballast levels are above the water line.

If stability and the ice belt depth allows, where no ballast tank heating or bubbling systems are fitted, periodic lowering of the ballast level may avoid freezing of the water surface.

8.2 Deck machinery

As well as the natural consequences of sub zero temperatures, e.g. freezing of liquids, another area that should be managed is the accumulation of ice on deck from freezing spray and rain. Consequently, many of the actions below relate to covering equipment with canvas, heavy-duty plastic sheet or similar. Ice accumulations on unprotected equipment will render the equipment inoperable.

Oil spill equipment should remain inside deck houses to prevent icing up if wet, but it should remain ready for use.

Tank gauging/dipping point valves should be covered to prevent ice accumulation. Cargo manifold pressure gauge connections should be covered to prevent ice accumulation. Action should be taken to prevent scupper holes from getting iced over and scupper plugs not fitting correctly. Coating the scupper plug rubber faces with petroleum jelly will prevent seizure of the plugs in scupper holes.

The main air valve to deck should be closed and the airline drained down, taking care to remove any moisture that may be contained within the line especially at the ends.

8.2.1 Deck Mooring equipment

For hydraulic equipment, for example, winches and hose handling cranes, particular attention needs to be paid to the operating temperature range of the hydraulic fluid.

For hydraulic driven systems, oil should be circulated all the time when external temperature is below 0°C so as to ensure that the fluid systems are maintained at working temperature. If this is to be achieved by leaving machinery (e.g. winches) running, careful attention must be paid to the regular lubrication of the equipment. The oil manufacturer's stated operating temperature range/viscosity must be checked for suitability. Oils may have to have to be treated with an appropriate viscosity additive or, in extreme cases, the oil may have to be changed for a more suitable grade.

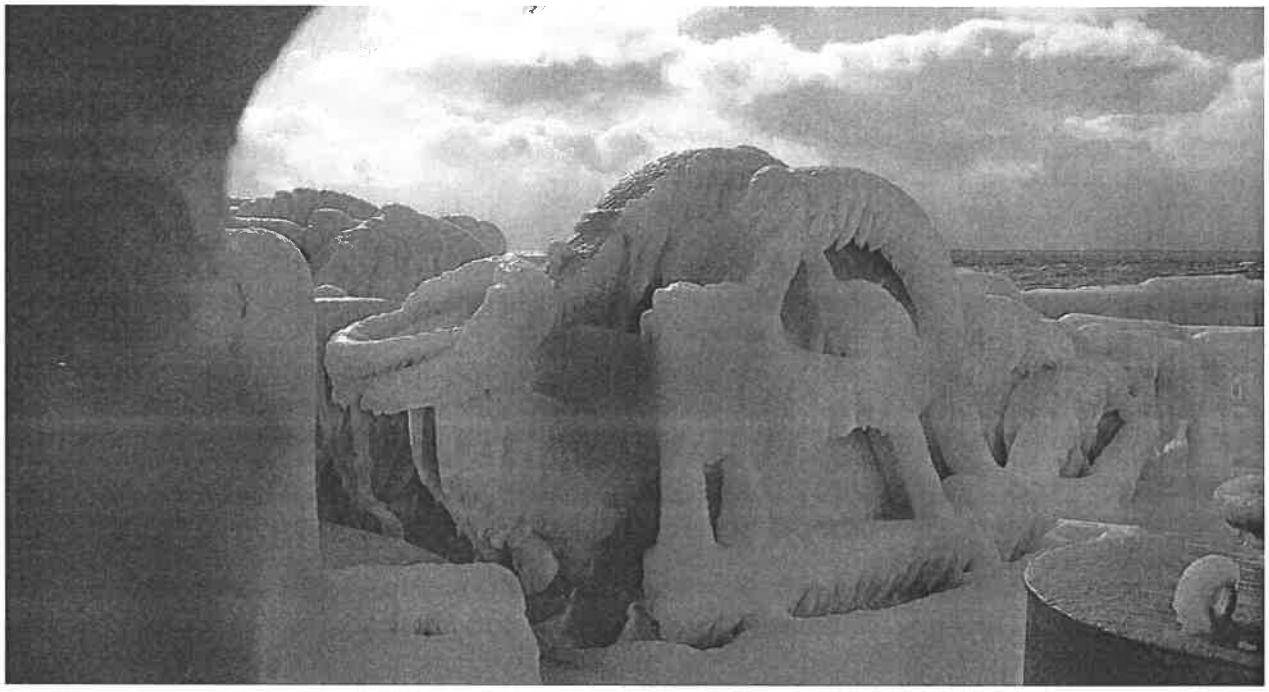
If a ship trades extensively within cold climates, a reduction of hydraulic line life can be expected. This can be up to 25% of the manufacturer's advertised life for these products.

Control boxes and motion levers should be protected by canvas covers.

8.2.2 Ice accumulation on windlasses

Mooring wires and synthetic ropes should be protected by canvas covers to stop ice accretion until they are required for use. If any mooring ropes have to be left out on deck, they should also be covered with canvas to stop ice accretion. The clutches and engaging gears of winches should be well protected by substantial coatings of grease to prevent icing Figure 2.

Figure 2



8.3 Engine Room

Prior to entering cold weather areas, the engine room should be prepared for the anticipated conditions. Particular consideration should be given to deciding when the engine room should be manned. The provision of black heaters in the engine room/machinery spaces will assist in maintaining temperatures above freezing. The use of hot-air-blown space heaters may also be considered within these spaces. The following points should be considered to maintain the safe and effective operation of the ship's propulsion and subsidiary systems.

8.3.1 Cooling System Intakes (Sea Chests)

Cooling water generally is going to be a problem in sub-zero sea temperatures. Prior to entering cool water, it is important that all seawater strainers are cleaned since a slightly clogged filter will lead to reduced flow, resulting in rapid ice formation within the strainer.

Ships that are not fitted with a system as specified by authorities, such as the Canadian Coast Guard, should exercise vigilance to ensure that heating arrangements of the cooling water sea chests are working at optimum efficiency. The machinery space should be constantly manned to ensure adequate and prompt action. If cooling water becomes too cold, reduce flow and/or bypass cooler water inlet with outlet. Should the flow become inadequate due to the build-up of ice on the sea chest, RPM should be reduced, plugging the intake until the heating system restores conditions to normal.

The steam heating system to all sea chests should be checked for good working condition and then kept operating when the ship is in ice infested waters. Flexible steam hoses should be connected to the sea suctions prior to arrival in ice or cold waters.

Consideration should also be given to the following:

- It may become possible to severely overcool the jackets, something that should be avoided
- Shut down to one central cooler
- Sea water system – main sea water system in engine room set up for re-circulation to sea chest with steam connections ready for use
- Raise central cooling temperature
- Adjust charge air coolers
- Monitor closely the scavenge temperatures and ensure that they are maintained within limits.

8.3.2 Fuel system

Ensure steam heating is operating on all bunker storage tanks, bilge tank, bilge overflow tank, main engine sump settling and service tanks. Bunker storage tank temperatures should be kept at least 5°C above the minimum transfer temperature given in the fuel's specification.

Consideration should be given to changing over from heavy fuel oil to diesel oil prior to closing down the main engine so that the fuel lines are primed with diesel oil instead of fuel oil. This ensures that any cooling of fuel lines will not result in oil solidifying within the lines.

8.3.3 Stern Tube

Stern tube oil should not contain any free water or be contaminated with water/oil emulsion. Consideration should be given to draining any water from the system or replacing the stern tube oil charge.

The temperature of the stern tube cooling water tank should be closely monitored. Consideration should be given to sourcing a suitable additive or temporarily draining the tank when the contents approach 0° C.

8.3.4 Ventilation

Consideration should be given to stopping all but one main engine room ventilation fan to maintain a reasonable ambient temperature in the machinery space. However, suitable air flow must be maintained to allow the correct operation of boilers, main and auxiliary engines if they are not provided with separate ducting.

Ensure, so far as possible, that vents feeding off the main ventilation system do not blow directly on to fuel lines or pipes containing fuel oil. Likewise, ensure that these vents are not blowing onto the heavy fuel oil transfer pumps.

Stop ventilation fans in the steering gear space and close fan flaps to maintain a reasonable ambient temperature.

Activate accommodation steam heating and maintain a comfortable temperature and humidity in accommodation spaces.

Regularly operate pneumatic and manual fan flaps to ensure their correct operation and avoid seizing.

8.3.5 Mechanisms

Regularly run hydraulic pumps to maintain the temperature of oil and machinery.

Portable space heating tape is an adhesive tape with wire contained in it that can be used to heat pipes, machinery, etc. It comes with the necessary documentation to calculate current, load and wattage. It provides a temporary, quick and cost-effective solution to heating pipes, machinery, etc. It is not "IX EX" approved and is therefore suitable for use only in non-hazardous areas.

Electrical motors not fitted with electric space heaters should be checked.

8.3.6 Generators

The fuel temperature of any generator running on gas oil/diesel oil should be monitored and arrangements made for temporary local heating if the temperature approaches the fuel's pour point.

8.3.7 Emergency generators

Some ships have emergency generators that have electric heating on the alternator end. This should be tested to ensure satisfactory operation.

The emergency generator room external vent flaps and supply fan damper should be kept closed. Notices advising of the status of the flaps and dampers should be posted in the emergency generator room and main engine control room. It should be ensured that the emergency generator has the correct amount of anti-freeze added to the cooling water.

8.3.8 Emergency batteries

Emergency batteries and power for communications' equipment should be protected from extreme low temperatures. Spaces containing batteries may need to be provided with space heaters, dependent upon their location/exposure.

GS batteries (maintenance free type) and GMDSS batteries (water/acid mixture) are unlikely to freeze in expected conditions but, as a precaution, can be covered with plastic sheet.

8.3.9 Compressed air system

If ice contaminates the general service and or instrument air system, there is the possibility of problems with on board instrumentation air supply, and also there is the possibility of blowing the general service air main valves.

8.3.10 Rudder & Steering Gear

Steering gear motors should be kept running at all times to keep the oil warm. Space heaters should be used in the steering flat to ensure no cold soak of the equipment takes place and also to protect the gauging system of any fresh water storage tanks that may be contained within the steering flat.

8.3.11 Lubrications and Oils

It should be ensured that only suitable winter grade oils are used. These will typically be effective down to temperatures of -20°C with only increased viscosity to be contended with.

8.3.12 Winter Diesel oils

Steps must be taken to ensure the vessel is supplied with diesel fuel. Special emphasis should be placed on the diesel fuel for the emergency diesel generator, suitability for use in negative temperatures and compliance with ISO-8217-2024 DMA specifications. The supplying organization is to be required to specify the pour point value on the delivery note for the supplied diesel fuel.

8.4 Fire protection systems and equipment

Precautions shall be taken to prevent dirt, rust or ice build-up from clogging the sprayers, pipework and valves of fire fighting systems.

8.4.1 Hoses and Nozzles

There is no restriction on the use of fire spray nozzles down to -25°C. Most hoses are rated for safe operation to temperatures of -20°C. Cold weather hoses are available that are rated to -40°C and are marked accordingly.

8.4.2 Fire and foam lines

The fire and foam lines on deck must be well drained, by opening drain valves and the lowest hydrant valve. Fire and foam lines must be ready for use at all times (not blanked). Monitors, hydrant valves and any other moving parts must be well greased and protected to avoid ice/snow accumulation that may prevent their immediate operation. Their movement should be regularly checked to ensure that they remain free for operation. In addition, the water curtain and spray system pipe work must be checked, drained and empty. Also any items drawing from the fire main, such as hawse pipe cable washer lines, should be drained down, particularly if a re-circulatory fire main line is in use (to avoid any "dead-ends").

Fixed foam system bulk storage tanks will need heating to ensure that the temperature in these spaces remains above zero. It may be necessary to source temporary space heaters to heat these spaces adequately.

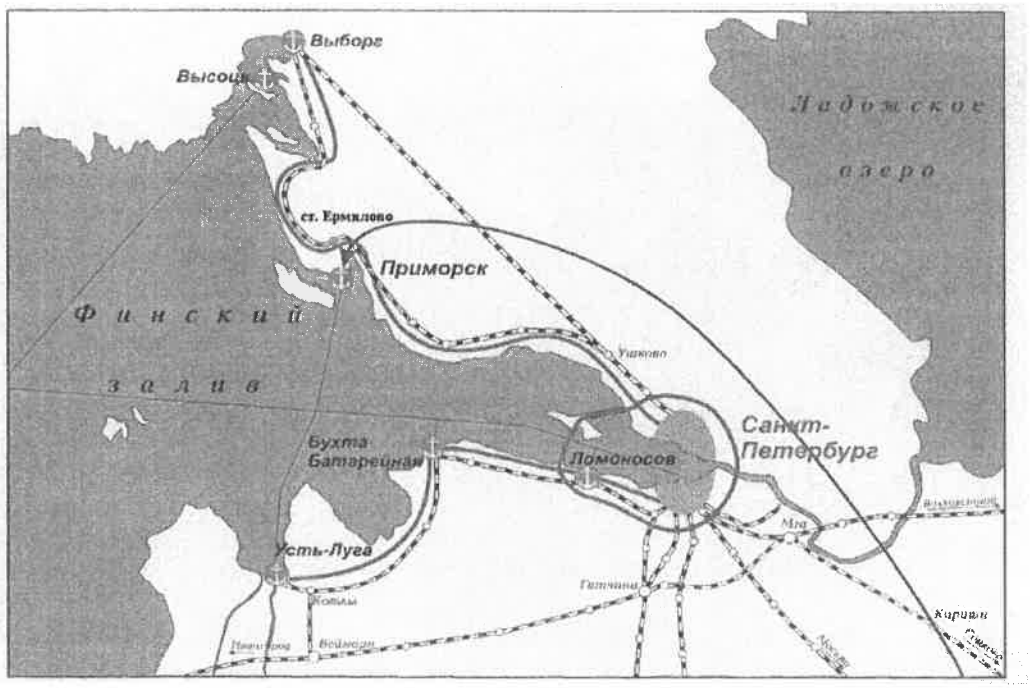
8.4.3 Fire boxes

These should be kept ice-free on catches/locks/dogs/hinges to allow ease of access. Spray nozzles and couplings should be well greased and water free. All hoses should be completely drained of water to avoid damage and to facilitate their rapid use.

9 Organisation of icebreaker escorts for ships

The Basin Commission, located in St. Petersburg and headed by the Head of FGBU 'Baltic Sea Shipping Company', is responsible for the organisation of icebreaker escorts to Russian ports and their approaches. The Icebreaker Guiding Headquarters (hereinafter referred to as the 'Icebreaker Guiding Headquarters') coordinates the work of icebreakers in providing icebreaker escorts to Russian seaports of the Baltic Sea.

Figure 3



Contact telephone numbers, e-mail address of the Icebreakers' Headquarters, location of the convoy meeting point and its coordinates, directions of icebreaker operations are published on the official website of FGBU "Baltic Sea Shipping Company" www.pasp.ru within the "Information of the Icebreaker Guiding Headquarters" section.

The Captain of Primorsk seaport, based on the recommendations developed by the Basin Commission, issues an order to impose restrictions on the class of vessels accepted by the port. Directives can be accessed on the website of FSBI "AMP of the Baltic Sea" www.pasp.ru within the "Sea port Primorsk" section, specifically under "Orders of the Captain of the Seaport".

10 Traffic separation schemes and mandatory ship reports (Gulf of Finland)

The Governments of Estonia, Finland and the Russian Federation have jointly established traffic separation schemes with mandatory ship reports in the Gulf of Finland. It is possible that during the ice navigation period the traffic separation zones in the Gulf of Finland may be declared temporarily inoperative by joint decision.

Information can be obtained from GOFREP (Reports in the Gulf of Finland) under 'Functions' and 'Vessel Traffic Management' on the website of the Finnish Maritime Administration (FMA) www.fma.fi.

The scheme of mandatory reports from ships for the winter navigation period remains in force. Vessel Traffic Services (VTS) centres will operate in cooperation with the national icebreaking services.

Annex A

(compalsory)

Winterisation check-list for vessels operated at Primorsk Oil Terminal

Ship's name:

IMO:

GENERAL		
	Yes	No
Are procedures available for navigation and operations in ice conditions and/or low temperatures (down to -25°C)?		
The residential temperature maintenance systems are in good working order.		
Means are in place to ensure safe movement about the vessel in sub-zero conditions.		
Crew members are provided with PPE to protect them from exposure to sub-zero temperatures.		
DECK AREA		
Measures have been implemented to protect the deck piping against the risk of freezing.		
Air intakes and fire dampers are free from ice and in good working condition.		
Measures have been implemented to ensure that ballast system is operational at sea temperatures of -2°C and sub-zero air temperatures.		
Measures have been implemented to prevent icing on primary and secondary ventilation systems of cargo tanks.		
All lines (fire, foam, fresh water, deck shower and others) are drained to prevent freezing and rupture.		
P/V breaker is filled with anti-freeze (glycol-based as opposed to methanol-based) in accordance with manufacturer's guidance prior to entering the Primorsk Oil Terminal.		
IG deck water seal is provided with an operational heating system.		
If P/V valves are not provided with a heating system, is procedure available that the valves are regularly checked by manual opening during cargo operations?		
Canvas covers are fabriceted and installed for rope drums when vessel is at sea.		
Portable steam hoses are checks, faund in good condition and rig for use.		

Is vessel fitted with ballast tank air bubbler system should start using them as soon as there is deemed to be any risk of the ballast water freezing? If NO air bubble system what measures been taken to prevent ballast water freezing (please discrabe)?		
Pipelines of BWTS are drained and checked prior enter sub-zero area to avoid freezing.		
Cargo, bunker and its drain pipelines are free from previouse cargo and drained to prevent freezing.		
Is satisfactory protection provided for the crane operator against wind chill? Is hydraulic oil is suitable for operate in sub-zero temperature?		
Hydraulic oil of mooring winches, windlasses and FROMO system is suitable for operate in sub-zero temperature.		
Crane's wire is proper way relled, greased and ready to use.		
Wooden mallets, snow shovels have onboard to assist in removing ice if it forms on deck or on fittings.		
ODME is drained.		
Hydraulic valves are checked frequently during cargo operations to prevent freezing.		
Manually operated valves of IG, COTs, Fire, Foam, Air systems well maintaned, checked and found ready to use.		
All void spaces, chain lockers etc. are sounded prior to operating in freezing conditions. Regular checks to be carried out.		
ENGINE ROOM		
Winter grade fuei oil is in use for EG to prevent waxing.		
What type of heating system is use to prevent freezing of emergency generator cooling water?		
Heating connection is fitted to at least one sea water inlet. The source of the heating (e.g. steam, water) should be specified.		
Measures have been implemented to prevent icing of the air lines to the settling and service tanks required for the main propulsion unit and the main auxiliary devices.		
Is heating coils in use or other system to prevent cooling of HFO tanks?		
Monitor load limit and torque limit parameters is in conjunction with shop test graphs for main engine in use to prevent overload.		
Steering gear pumps keeps run all times to prevent sluggish.		

Annex B

(recommendation)

Example of a Risk Assessment for operation in ice conditions

Vessel:
Description of the task ahead: Ice navigation
Risk assessment team: Captain, Chief Engineer, Chief Mate, Superintendent.

DANGER	THE SAFETY MEASURES NECESSARY TO KEEP THE RISK AT AN ACCEPTABLE LEVEL	ACCEPT THE RISK
CREW		
Effects of cold on the crew	The ship's crew, both on board and those scheduled to come on board, should be provided with warm clothing. Sufficient winter warm clothing should be ordered and delivered to the ship in advance of the ship commencing operations in areas of sub-zero temperatures. These are suits, balaclavas and thermal underwear. Overalls shall be worn when working on open decks.	
Lack of experience in ice	Captains and, if practicable, watch mates should take additional ice navigation courses. The chief engineer should preferably have experience in ice navigation.	
Slipping and falling on an icy deck	Crew should exercise extreme caution when standing and working on decks. One hand should be kept free at all times, if possible. When required, use the transition bridge.	
Slipping and falling on an icy deck	The vessel shall be provided with sufficient technical salt/sand to sprinkle on deck passageways and gangways.	
Watching at the gangway in the open wind and cold	Provide comfortable shelter near the gangway for watchkeeping, avoid direct exposure to wind. Provide watchkeepers with frequent breaks for warming up. Hot food and drink should be available at all times.	
Cooling of living and working spaces in the superstructure	Ensure adequate operation of shipboard heating systems. Provide additional heating on the bridge.	
Captain's fatigue due to prolonged time on the bridge	Prior to approaching the ice edge, provide rest periods before undertaking upcoming extended watches. When the presence of the Master on the bridge is required to ensure safe navigation, the vessel should anchor before crossing the ice edge to allow the Master to rest. It is recommended that the vessel's speed be adjusted to approach the ice edge during daylight hours.	
VOYAGE PLANNING		
Lack of transition	The transition plan for the upcoming voyage should include all	

planning	available information on ice conditions from known sources.	
Liability for failure to report navigational hazards.	It is the captain's duty to inform of a navigational hazard (M 1641) - 'when ice is detected' or when 'very low air temperatures in gale force winds resulting in significant icing' - if such information has not already been published.	
Inspection checklists are not being used	The Ice Swimming Readiness Checklist must be fully completed before approaching the ice edge	
All available information is not used	1. Register circulars - refer to the circular letters of the classification society concerning in particular ice damage to propellers.	
	2 Use all available information including NAVTEX messages / ice charts / BIMCO weekly ice information.	
	3 Use sections of the following publications - Seafarers' Handbook, Meteorology for Seafarers, Code of Signals.	
NAVIGATION		
Damage to the vessel	The ice / its thickness must be monitored at all times.	
No manoeuvrability	When sailing in or near ice, the main engine must be in manoeuvring mode.	
Insufficient watch on the bridge	Operate the vessel using manual control only, and additionally deploy a forward lookout.	
Excessive ice build-up	Reduce travel to reduce splashing if ice starts to build up. Start at an air temperature of -2°C. Cover ballast tank vent heads, cargo tank high-speed valves, and half-bank fans with tarpaulins. Place slats between the tarpaulin and the equipment to be covered to assist in ice removal. Shroud winches and windlasses. Use lubricant to prevent ice build-up on high-speed cargo tank valves and deck machinery.	
The captain has not been informed	Call the Captain immediately when ice is detected.	
Propeller damage	Ensure that the propeller is at maximum submergence and maintain it. Ballast the vessel, if necessar	
Damage to the hull during ice entry	Ensure that when entering the ice, the running speed is reduced to a safe value.	
Damage to the housing due to excessive stroke	The maximum speed when navigating in ice shall not exceed the design speed for such an operation.	
Damage to the enclosure due to ignorance of design features	Familiarise yourself with the structural capabilities of the vessel. Confirm the possibility of safe navigation in broken or shallow ice (drift ice).	

Hull damage by hummocks	If an ice searchlight is fitted, ensure that it is switched on when navigating on ice at night. If the vessel is forced to stop running, the searchlight should be switched off until the vessel resumes running.	
Ice/snow formation on decks	If ice forms on the deck, or if there is snowfall, there may be an increase in the draft, roll or trim of the vessel.	
Damage to thrusters	Do not use the thruster in ice. Ice trapped in the thruster can damage the propeller blades.	
Damage caused by heavy ice accumulation	If the boat is stopped by hard ice, the rudder should be kept straight and the engine should be run forward so that the propeller remains clear of ice. Regular stern observations are required to ensure that the propeller and rudder are in clear water and free of ice.	
Ice drifting	If the vessel is stopped and has no course relative to the ice, the drift of both the vessel and the ice can be easily detected using GPS or any other navigational methods.	
Reduced manoeuvrability	When navigating in ice, the manoeuvrability of the vessel is drastically reduced. The circulation radius will increase significantly.	
Damage during reversing	When reversing, keep the steering wheel straight and drive with caution. Before reversing, work the machine forwards to clear the stern of ice.	
Traffic separation zones	Be aware that Traffic Separation Zones may be temporarily cancelled.	
Reliability of the navigational fence	Summer buoys are removed for the winter period. If they have not yet been removed, they cannot be relied upon at the beginning of ice break-up, as they may be in out-of-state locations.	
Lack of knowledge of local sailing conditions	In some areas it is possible to take an ice pilot. Consider the possibility of ordering an ice pilot.	
Anchor loss	Do not anchor in or near ice. This can easily lead to loss of the anchor as the anchor-chain may be torn by ice movement	
No interaction with icebreakers	При плавании с ледоколом полностью с ним взаимодействовать и четко выполнять его указания.	
Proximity of ships when sailing in convoy	When sailing in convoy, a watch is required to watch the stern. The distance between ships travelling in convoy is not great - from 3 to 5 kbt. Constantly control the distance between vessels.	
Damage to a vessel while moored at the berth	If the vessel, while moored to a mooring, is affected by significant ice movement due to current, tide or strong winds, be prepared to move away from the mooring immediately if the moorings prove ineffective.	

ENGINE DEPARTMENT		
Clogging of the cooling system intake filters with seawater	Clean the receiving filters of the kingston boxes before starting the vessel in ice. Connect the steam supply hose to the mains and keep ready.	
Ice/melted snow entering the cooling system with outside water	Recirculate the intake water. Close or cover the valve of the intake connection of the intake water.	
Temperature reduction in engine room double bottom tanks	Use heating coils where they are installed.	
Paraffin clogging of fuel system filters and pipelinesы	Use a steam supply system.	
Reducing the temperature to sub-zero in the tiller compartment.	Use heaters in the tiller compartment	
Reduction of temperature in heavy fuel tank	Use heating coils	
Overloading of the Main Engine	Monitor the compliance of load and torque parameters.	
Failure of the Main Motor	Keep the Main Engine on constant alert. Two persons on watch in the engine room. If the vessel is in imminent danger, contact local authorities and request icebreaker assistance.	
Low temperature in the engine room	Close off as many discharge fans as possible, if the main engine is not running - if possible reduce the number of discharge fans.	
Slow operation of the steering unit pumps	Keep pumps in operation at all times.	
GENERAL		
Defrosting and damage to piping systems: fire, foam, fresh water and deck irrigation systems	All pipework should be drained to prevent defrosting and ruptures. Ensure that systems are quickly brought back into service in an emergency.	
Operating condition of high-speed	Make and use tarpaulin covers to prevent defrosting and blocking of named equipment.	

valves, blow-off pipelines, P/V breakers, ballast tank fans	Liquid D/H breakers shall contain a 50/50 mixture of water and glycol. Ensure sufficient glycol on board.	
Operating status of high-speed valves	At freezing temperatures, check valves regularly before and during cargo operations.	
Damage to mooring ends	When the vessel is at sea, winches with mooring ends shall be covered with tarpaulin covers. The ends not stowed on the winches shall be stored below deck to prevent icing.	
Condition of the steam hoses.	Check that the portable steam hoses to the deck and MO are in good condition and have them ready for use.	
Condition of heating coils	Maintain steam supply to the deck at all times, at least one coil should be slightly ajar. The temperature inside the tanks can be monitored by radar. Drain, blow out and insulate coils not in use.	
Damage to ballast tanks and or ballast pumps due to ballast freezing	Ships equipped with ballast tank air blowing systems should start using them as soon as any risk of ballast water freezing appears.	
Failure of the Framo system pumps	Warm up the system and pumps to the required temperature before loading. Maintain oil circulation through an open preheat valve.	
Cargo and bunkering pipelines blocked by cold cargo	No cargo residues should remain in the pipelines at low temperatures. During cargo operations alternate tanks more frequently. At the end of cargo or bunkering operations, immediately dry and blow out pipelines.	
Ice build-up	The vessel should have wooden hammers to remove ice forming on the deck and machinery.	
Operating condition of the deck gate of the inert gas system	Provide the required intake water flow rate to the deck penstock Utilise the steam heating coil.	
Damage to ODME	Drain ODME (Oil Discharge Monitoring Equipment)	
Operating condition of hydraulic valves	During cargo operations, check operation of hydraulic valves frequently to prevent them from freezing.	
Failure to make normal use of abandon ship procedures	The crew must be assembled as usual. Do not drop the freefall lifeboat while on ice. Consider dropping the freefall lifeboat down to the water and lowering life rafts using a crane girder. Avoid walking on ice.	
Defrosting empty compartments, chain lockers, etc	All these compartments must be measured before operating in freezing conditions. If there is water in the compartments, it must be removed and the compartments must be checked regularly.	

Annex C

(advice)

Classification Societies' ice class equivalents

Thickness of the flat ice	Mote that 50 sm	30 - 50 sm	15 - 30 sm	10 - 15 sm	Less than 10 sm
RMRS**	LU5 / Arc 5	LU4 / Arc 4	LU3 / Ice3	LU 2 / Ice 2	LU 1/ Ice 1
Germanischer Lloyd	E4	ICE - 1A*	1A SUPER	1AS	1 AS
Norwegian Bureau Veritas	E3	ICE - 1A	1A	1A	1A
Bureau Veritas	E2	ICE - 1B	1B	1B	1B
Lloyd's Register	E1	ICE - 1C	1C	1C	1C
Maritime Register of Italy	E	ICE - C	1 D	1D	1D
American Bureau of Shipping	1 AA	1 A	1 B	1C	D0
Class Nippon Japan	1A Super	1A	1B	1C	1D
Finnish-Swedish Ice Class	1A SUPER	1A	1B	1C	Category II
Korean Maritime Register	ISS	IS1	IS2	IS3	IS4
Chinese Classification Society	Ice Class B1*	Ice Class B1	Ice Class B2	Ice Class B3	Ice Class B
Indian Classification Society	HAT(B)	HT(B)	HM(B)	Ha(B)	-

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