

# Ice - Advice for trading in the polar regions

---

Read about Insurance  
at page 10

---

---

Read the summary  
at page 14

---



2014



# Contents

---

Executive summary	3
Introduction	4
Risks	5
Northern Sea Route	5
Assessment	6
Risk assessment	6
Navigation	7
Crew	7
Pollution	8
Class Notations	9
IACS Polar Class Rules	9
Ice-regime	10
Insurance	10
Technological Advances Aiding Polar Navigation	12
GNSS	12
Echo Sounding	12
e-Navigation	12
Navigational Systems	12
International Regulations	13
Summary	14

## Executive summary

To trade in the polar regions the vessel and crew are exposed to completely new challenges and risks that do not occur in normal open water sailing:

- ▶ In the polar regions temperatures can be as low as -50°C,
- ▶ There are floating growlers and icebergs which are as hard as concrete,
- ▶ The waters are not surveyed satisfactory,
- ▶ Pollution is extremely difficult to clean-up,
- ▶ Salvage equipment may not work in freezing temperatures
- ▶ It is physically exhausting to work in low temperatures.



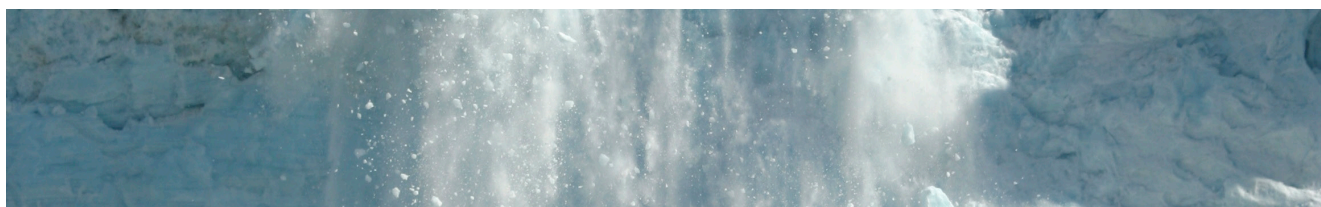
### Transits per year

2010 = 4

2011 = 34

2012 = 46

2013 = 60



**A vessel should, as a minimum, fulfil the following requirements when sailing in the polar regions:**

- ▶ Have the highest Swedish/Finnish ice-class 1A or 1A Super. It is important to remember that this ice class is not designed for a vessel to sail in multiyear ice that exists in the polar regions.
- ▶ Have the assistance of an icebreaker which is appropriate for the conditions
- ▶ Have completed a risk assessment for the entire voyage which includes assessment of onboard equipment and machinery and how this equipment will handle low temperatures
- ▶ That the shipowner evaluates what extra spare parts need to be onboard for the transit
- ▶ An ice pilot should be onboard assisting the crew. It is essential that the ice master is fluent in English.
- ▶ The shipowner should also ensure that salvage assistance can be done by an approved company
- ▶ Should ensure that the crew have been given familiarization training about sailing in the polar regions
- ▶ The shipowner should ensure that the vessel adheres to the requirements of the ice-regime in the area. If there is no ice-regime in the area the vessel should operate as if it was sailing under an ice-regime. At the moment there are only two Arctic ice-regimes, namely the Russian and Canadian ice-regimes.
- ▶ The shipowner has to inform their Hull underwriter and P&I club before trading in the polar regions.

# Introduction

The wealth of natural resources in the arctic region is enormous. It is believed that up to a quarter of the world's undiscovered, recoverable hydrocarbon reserves are in the arctic seabed. There are also huge additional iron, gold, zinc and diamond deposits which will become more accessible if the arctic ice continues to diminish.

Shipping activity in the polar regions is a complicated endeavour. It seems that longer ice-free summers in the arctic are making operations in the polar regions more accessible in combination with the development of new technology. What seemed impossible before because of the rough weather and thick ice is now becoming possible. This activity will probably increase even further in the future because the search for natural resources such as oil, gas and metals is unlikely to stop. Much of the increased activity in the polar regions will be from offshore operations traffic involved in exploration and extraction of oil and gas. This will increase transports from and to the arctic ports in the region.

The polar regions consist of the Arctic and Antarctic and there are some significant differences between the two regions. The Arctic is an ocean surrounded by continents, while the Antarctic is a continent surrounded by an ocean.



Photo: Ola Andersson, The Swedish Maritime Administration

## Examples of issues affecting trading in the polar regions:

- ▶ Trading is only possible for a limited time during the year
- ▶ Ice conditions can change quickly
- ▶ Availability of ice class tonnage
- ▶ Type of cargo – oil, gas, metals and fresh fish
- ▶ Increased bunker prices
- ▶ Insurance

## Risks

By its very nature, ice is constantly changing and, as such, it is an unpredictable element. It is not always possible to predict with certainty the severity of ice. Relevant factors, however, are the salinity of seawater, wind, sea state, and currents. Even so, ice continues to present difficulties, even to experienced masters with up-to-date information on ice conditions.

The condition of the vessel is important when sailing in ice. For example, is the vessel in ballast or laden, or are there other factors which will affect the efficiency of the vessel? Ice may also have a serious impact on the seaworthiness of the vessel. If icing forms on the vessel's hull this can cause instability and endanger its seaworthiness.

If a casualty would occur in the polar regions, assistance will be limited because of the lack of infrastructure. It is likely that it will take a long time for salvage vessels to arrive. This could cause a minor incident to become a serious casualty, which could endanger the vessel, its crew and the environment. Heavy weather and ice could also delay the salvage, which could even prevent the rescue. In the event of a total loss, the wreck removal is likely to be very difficult.

Outside the Arctic commercial shipping routes, like the Northern Sea Route, vessels will be even more isolated and it could take weeks until rescue arrives. It is difficult to find a port in the polar regions with spare parts or even a port where parts can be flown into. The shipowner needs to be aware of what assistance is available in the ports throughout the passage. Many ports only have smaller airfields that can only accommodate smaller airplanes and roads might not even exist. Because of this the vessel needs to carry sufficient spares and be able to repair critical equipment. This also applies to food and supplies which need to be sufficient if the vessel is delayed for some reason.

### Northern Sea Route

Over recent years there has been an increase in traffic between Northern Asia and Northern Europe through the Northeast passage/Northern Sea Route (NSR) even if the initial figures were low.

Tonnage is moderate as the governing draft of the NSR is 12.5 meters. This is not an area for operations with the bare minimum crew. Sailing through the Northern Sea Route is only possible from June to November. The NSR has been surveyed but the Arctic basin is poorly surveyed. In fact any area outside the normal NSR routes has been poorly surveyed. It seems that the western area of the NSR has been better surveyed than the Eastern part.

The most common cargoes transported through the NSR are petroleum products, ore products as well as reefer cargo like fish and gas such as LNG and LPG.



To sail through the Northern Sea, route the shipowner has to apply for a permit to the Russian authorities. The arrangement is handled by the Northern Sea Route Information Office. Icebreaker support includes navigation in the ice channel and the vessel is either towed or follows an icebreaker. This is done in an ice convoy or as a single vessel. For detailed information contact the Northern Sea Route Information Office.

As an ice pilot is required to be on the vessel when transiting through the NSR, there are some issues that are important when a vessel is being assisted by an icebreaker which are:

- ▶ Maintaining the position in the ice convoy
- ▶ Maintaining the speed and distance to the vessel ahead as instructed
- ▶ Reporting any concerns to the icebreaking master immediately

**The ice pilot shall provide assistance to the vessel's master regarding the specific conditions and requirements in the Northern Sea Route as follows:**

- ▶ Assessment of ice conditions and possibility of safe navigation for the vessel in the current conditions
- ▶ The optimal route for the vessel and how to navigate it properly in icy water when not assisted by an icebreaker
- ▶ How to avoid ice damage to the vessel's hull and propulsion system
- ▶ Suggested safe speed and distance to the icebreaker or any other vessel

## Assessment

When sailing in an area with ice, shipowners need to have a contingency plan if their vessels suffer ice damage. It is likely that the maintenance for the propulsion system will have to be increased, as it will be used with a greater load compared to normal trading.

To be able to complete the required maintenance the vessel will need to carry a larger stock of spare parts. This not only includes spare parts for the propulsion system but also for other critical systems such as the navigation system. This is because in the polar regions there is a lack of well-equipped ports.

Other equipment which can be affected by the cold climate includes ballast systems, cargo systems, hatch covers, cranes, mooring equipment, radars or anything that can freeze or be damaged if not properly protected from low temperatures or weather.

Specific risks and what assistance is available should be evaluated by the shipowner for the specific route. For a successful outcome it is essential that the crew has the necessary experience for navigating in the polar regions and that an ice pilot is onboard assisting the crew.

### Risk assessment

The following should at least be included in the shipowners risk assessment for sailing in the polar regions:

- ▶ What search and rescue facilities are available?
  - ▶ Are there port facilities for vessel waste?
  - ▶ What is the distance to the nearest port of refuge?
  - ▶ Is ice pilotage provided?
  - ▶ Is ice breaking assistance available?
  - ▶ If the vessel is wider than the icebreaker will two ice breakers assist so that the vessel don't have to break ice?
  - ▶ Are ice forecasts available?
  - ▶ Are there reliable charts as large parts of the polar regions lack modern hydrographic surveys?
- ▶ Does the vessel have meteorological, oceanographic, ice and iceberg charts?
  - ▶ Can the vessel receive continuous updates to the ice charts?
  - ▶ Evaluate if the engine room should be manned 24/7 to prevent a small failure becoming a disaster
  - ▶ Evaluate if the bridge should have extra officers and lookouts
  - ▶ Determine if the navigation and communication equipment is sufficient for the polar regions
  - ▶ Will essential equipment for the transit be able to handle low temperatures?
  - ▶ What new technology could assist the shipowner?
  - ▶ Specific polar region procedures on how position fixes should be done,
  - ▶ Complete a specific navigation equipment risk assessment for all concerned equipment,
  - ▶ Procedures for how the radar should be tuned and set while navigating in ice conditions,
  - ▶ Have a complete passage plan from berth to berth,
  - ▶ Have a specific oil spill plan for the polar regions, as an oil spill can be disastrous for the ecosystem,
  - ▶ Have procedures and preventive measures if machinery and equipment is affected by the cold climate,
  - ▶ Have the crew received familiarization training about sailing in the polar regions?

The following is written in the polar ship operations guide: "When operating in ice it is important to adhere to the following:

- ▶ Excessive speed leads to damage
- ▶ Once in the ice, keep moving, even if very slowly
- ▶ Work with ice movement, not against it
- ▶ Knowledge of ship's manoeuvring characteristics and turning radius is vital"

## Navigation

It is important to be aware that charts might be based on surveys which are old and unreliable. This is also the case for electronic charts which can be based upon old paper charts. The master must be aware of what kind of chart he is navigating with and how reliable it is.

Much of the arctic waters lack proper chart surveys. Only about 10% of the Canadian arctic waters have been surveyed. The Northwest Passage routes in Canada are generally charted and the approaches to the ports. In 2010 the cruise ship *Clipper Adventure* grounded when it navigated outside the suggested Northwest passage route. It took more than three weeks for assistance to arrive.

It is essential that the risk assessment includes the reliability of charts and which chart data is used. Recalculating the vessel's position is often required when transiting areas using different chart data. The risk of grounding due to incomplete or inaccurate hydrographic surveys can be lessened if the vessel is equipped with modern three-dimensional (3D) forward-looking sonar and that the bridge officers are properly trained in its use. Forward-looking 3D sonar technology is capable of sensing hazards to navigation up to 1,000 meters directly ahead of the vessel at speeds of up to 30 knots. The issue with a forward-looking sonar is that it might be difficult to install on a commercial vessel.

Navigation systems have now improved and can work properly on latitudes North/South 80 degrees. Ordinary gyrocompasses or normal compasses do not work North/South 85 degrees but the GPS compass has been developed to offer a reliable source of heading at these latitudes.

The GLONASS position system is a good complement to GPS as differential GPS correction doesn't exist in the polar region.

Satellite images are getting better and less expensive. It is important to understand that satellite images can be obsolete in a couple of hours because ice can be drifting at a speed of 0.5 knots.

Communication can also be difficult to maintain in the polar regions as the vessel might be outside the coverage for

satellites. If a distress signal is sent it might not be received by an SAR centre. The only reliable system above North/South 80 degrees is Iridium.

## Crew

Another risk is if the vessel is manned by a crew that lacks experience of navigating in the polar regions. This is a relevant risk, because making the correct decisions are key for a successful outcome.

Experience is always the best source of knowledge but it is important to be aware that there are a very limited number of experienced polar navigators. If there is a lack of experience this can be remedied with the assistance of an ice pilot. Officers need to be able to identify old sea ice and smaller forms of glacial ice. It is also harder to identify smaller growlers, compared to large ice bergs but a growler can also cause serious damage to the hull.

Bad planning can cause the vessel to hit ice while manoeuvring which can lead to damage to the propeller or rudder. First year ice is not very hard but old ice can be as hard as concrete.

Summer fog is common in the polar regions, and this coupled with ice and unreliable charts is an increased risk for grounding or puncturing the hull.

A famous casualty happened in 1989 when the Soviet Union flagged vessel *Maxim Gorkij* hit an ice floe at 17 knots west of Svalbard, Norway, in good visibility. The vessel was punctured and took in water. The master ordered abandon ship, as he believed that the vessel would sink. Passengers were evacuated in open lifeboats and also onto ice floes. At the time of the casualty there were three-meter waves and the passengers on the ice floes were in immediate danger. Fortunately a Norwegian coast guard vessel was in the vicinity and rescued the passengers. The reason for the high speed is unknown but it shows the severe consequences a poor decision, or what a mistake can cause in the polar regions.

The best prevention is to be thoroughly prepared and have comprehensive risk assessments.

## Pollution

The ecosystem in the Arctic is unique and would suffer if a serious oil spill occurred. This, in combination with the difficulties of cleaning up an oil spill in the Arctic, is a concern. These environmental concerns need to be addressed by the Arctic countries and hopefully they can agree on cooperating.

This is also addressed in the WWF publication *The Circle* no. 1 2014 on page 21, *"Given the lack of response infrastructure and resources for cleanup and mitigation of accidental spills, a spill in Arctic waters could be devastating to the fragile ecosystem."*

It is technologically difficult to clean-up an oil spill in a cold climate. The rules that apply in warmer climates do not apply in cold climates, the environment is more fragile, and recovery of the ecosystem takes a longer time. An oil spill in the Arctic regions will most likely cause a lot of public attention. Normal oil spill equipment is likely to freeze. It is a harsh and difficult environment to work in which should not be ignored and proper assessments need to be completed.

In the Fram Centre scientific programme for the flagship *"Sea Ice in the Arctic Ocean, Technology and Systems of Agreements"* it states, *"The risk for accidents with releases of oil in ice-covered waters increases as the shipping and petroleum activities expand northwards. Compared to the in-depth knowledge regarding oil spills in open water conditions, our knowledge of Arctic oil spills is still limited. The ice makes detection of oil difficult and may slow down its drift and dispersal. Low temperatures and reduced wave energy may reduce the weathering of oil, as well as evaporation and dissolution of lighter toxic compounds"*.

The prevention of an oil spill in the Arctic is of the highest priority for the Arctic council as stated in the **Arctic Council Status on Implementation of the AMSA 2009 Report Recommendations** May 2013 page 14 II(F). **Oil Spill Prevention**,



*"That the Arctic states decide to enhance the mutual cooperation in the field of oil spill prevention and, in collaboration with industry, support research and technology transfer to prevent release of oil into Arctic waters, since prevention of oil spills is the highest priority in the Arctic for environmental protection."*

Another environmental concern for the Arctic is the introduction of invasive species through transport on the hull as well as the discharge of ballast water and sediment. The chance of survival for invasive species becomes greater as the temperature of seawater in the Arctic increases. Recent efforts through IMO have sought to better manage discharges. However, groundings and collisions resulting in the accidental discharge of invasive species is a real possibility.

*A spill in Arctic waters  
could be devastating  
to the fragile ecosystem.*



## Class Notations

Vessels have to be ice-classed according to the regional, and at times local, requirements to be able to enter an area that is governed by an ice-regime. The ice class defines what kind of ice the vessel is designed to withstand and not the area the vessel will sail or operate in. Some vessels are built to withstand large amounts of ice, whilst other vessels only need to encounter a little ice before being damaged. The requirements will differ between countries. In Canada the worst-case scenario for the entire operation needs to be presented and the ice class is set to what assistance the escorted vessel needs to have to complete the entire operation.

To sail in the Baltic region during the winter season, vessels have to be of the highest Swedish/Finnish ice-class rules 1A or 1A Super. The ice class of the vessel is dimensioned for following an icebreaker in a broken channel.

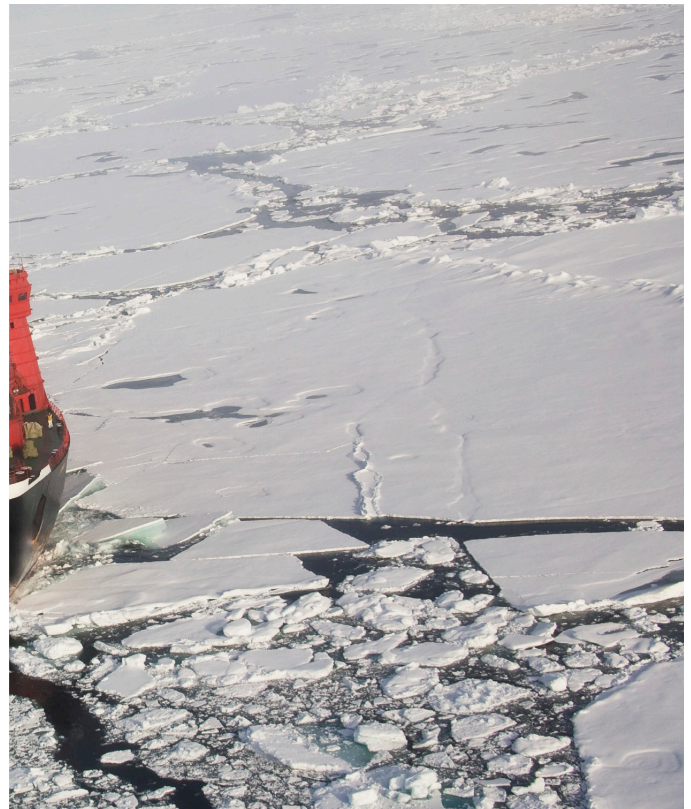
The classification societies have designated different ice classes for strengthening the hull and engine output while trading in ice conditions. It is essential that the shipowner maintains their vessels as per class requirements for the specific ice class. Below are the IACS class rules for vessels sailing in the polar regions.

## IACS Polar Class Rules

Polar Class Ice Description (based on WMO Sea Ice Nomenclature)

- PC 1 Year-round operation in all polar waters
- PC 2 Year-round operation in moderate multiyear ice conditions
- PC 3 Year-round operation in second-year ice, which may include multiyear ice inclusions
- PC 4 Year-round operation in thick first-year ice, which may include old ice inclusions
- PC 5 Year-round operation in medium first-year ice, which may include old ice inclusions
- PC 6 Summer/autumn operation in medium first-year ice, which may include old ice inclusions
- PC 7 Summer/autumn operation in thin first-year ice, which may include old ice inclusions

The IACS polar class rules are being revised and hopefully within two years there should be some updates. Ice class is not part of the main class but is an additional voluntarily class. The class will not be withdrawn if the vessel operates in icy waters that it is not designed for. Because of this it is important that the shipowner and insurer evaluate the risks and set requirements as per the vessel's ice class and overall suitability if the vessel will navigate in the polar regions.



## Ice-regime

For the Polar Class Rules to be successful in their implementation for trading they should be linked to an ice-regime system. So what is an ice-regime? This is a system that applies ice class requirements to different regions depending on season e.g. first year ice at -1°C varies a lot from first year ice at -40° C. There is an ice-regime in the Baltic which is operated by Sweden and Finland and there are also ice-regimes in Canada and Russia.

A critical region which does not have an ice-regime is Greenland. This is a concern and a prudent shipowner entering this region should apply the same requirements upon themselves as if they would enter the Russian or Canadian ice-regime. The ice-regime identifies how the vessel is supposed to be operated and what the minimum requirements are for the vessel to be allowed to enter the area which is covered by the ice-regime. Some issues usually need to be verified which include:

- ▶ Can the route with minimal ice be chosen?
- ▶ Does the vessel have to maintain a position and defend against ice?
- ▶ What ice class does the vessel have?
- ▶ Is the vessel escorted by an icebreaker?
- ▶ Can the vessel handle the broken ice?
- ▶ What experience does the crew have?

If the Polar Class Rules are not linked to an ice-regime, then the rules have little practical value as it could be very difficult to apply them to an operation. For vessels to trade safely in the Arctic it is essential that they trade in areas which are governed by an ice-regime. If the area is not governed by an ice-regime the vessel should trade as it was sailing in the Canadian or Russian ice-regime.

The best ice-regime would be if the Arctic countries could agree upon common standards, requirements and regulations. This would make an operation in the arctic more predictable and the shipowner would know what kind of vessel is suitable and what the requirements are.

## Insurance

The hull cover for vessels sailing in the polar regions is defined by trading warranties which exclude defined geographical areas. These exclusions are seasonal or all year round. For instance the Baltic Sea and St Lawrence River are seasonal exclusions while Antarctica and the Arctic Regions are all year round exclusions. This is the same both under the Nordic Insurance Plan and the English Institute Warranties. The shipowner is therefore required to inform the hull underwriter when a vessel is planned to enter an excluded area, including transiting the NSR, so the owner can get permission to enter

the area. When the underwriter has allowed the vessel to enter, the shipowner will have to pay an additional premium for the increased risk. The additional premium usually only cover one voyage but there can be arrangements for seasonal premiums. This is negotiated on a case-by-case basis. For queries about additional premiums, please contact The Swedish Club.

In addition, the Russian authorities require that the vessel has valid P&I insurance when transiting the NSR. The P&I clubs do not set any specific trading limits as the Hull underwriters do. However, P&I insurance generally includes "alternation of risk" provisions and the change of trading pattern to the NSR is likely qualify as such an alternation of risk<sup>1)</sup>. The shipowner therefore needs to also inform the P&I club if they are planning to transit the NSR, as otherwise liabilities, costs and expenses arising out of the transit may fall outside the P&I cover. The P&I Club will also be able to assist the insured generally in assessing the risks involved.

If damage happens while trading in ice the crew should document the situation with photographs or videos. Damage typically occurs on the inbound or outbound voyage to a port and the argument frequently arises whether the vessel should have waited for icebreaker assistance. A port which would naturally be icebound for certain months of the year is not necessarily an icebound port within the meaning of an ice clause (nor an unsafe one) if it is kept open by icebreakers.

Transiting the NSR may also give rise to claims and legal issues under charterparties. Under English law, the fact that a vessel has agreed to proceed into an ice area may not necessarily mean that the owners have waived their right to claim for any damage caused by ice, but instead it will be dependent on the wording of the charterparty.

A typical scenario is when a vessel has been ordered to a port where there is ice and, as a consequence, suffers damage to the propeller, rudder or hull. Usually there will be a claim for both repairs and loss of hire. A performance claim may also follow if the vessel has been forced to continue trading with a damaged but still operational propeller, with reduced revolutions. In worse cases even the main engine might have suffered damage due to stresses and overload getting through the ice.

Claims relating to engine damage, however, will normally only succeed if it can be proved that the engine has been overloaded to avoid danger.

---

1). As far as The Swedish Club's P&I insurance is concerned, see Rule 5.3 of the General Swedish Marine Insurance Plan of 2006 and Chapter 8 paragraph 10 of the Insurance Contracts Act which both are applicable pursuant to P&I Rule 2.

### A vessel should, as a minimum, fulfil the following requirements when sailing in the polar regions:

- ▶ Have the highest Swedish/Finnish ice-class 1A or 1A Super. It is important to remember that this ice class is not designed for a vessel to sail in multiyear ice that exists in the polar regions.
- ▶ Should have the assistance of an icebreaker which is appropriate for the conditions.
- ▶ Have completed a risk assessment for the entire voyage which includes assessment of onboard equipment and machinery and how this equipment will handle low temperatures.
- ▶ That the shipowner evaluates what extra spare parts need to be onboard for the transit.
- ▶ An ice pilot should be onboard assisting the crew. It is essential that the ice master is fluent in English.
- ▶ The shipowner should also ensure that Salvage assistance can be given by an approved company.
- ▶ Should ensure that the crew have been given familiarization training about sailing in the polar regions.
- ▶ The shipowner should ensure that the vessel adheres to the requirements of the ice-regime in the area. If there is no ice-regime in the area the vessel should operate as if it was sailing under an ice-regime. At the moment there are only two Arctic ice-regimes, which are the Russian and Canadian ones.
- ▶ The shipowner has to inform their Hull underwriter and P&I club before trading in the polar regions.



Photos: Ola Andersson, The Swedish Maritime Administration



# Technological Advances Aiding Polar Navigation

The shipping industry is researching and developing better hull shapes and propulsion systems for sailing in ice. The Russians are building new nuclear icebreakers and Canada is planning for new icebreakers as well. If this will be sufficient the future will tell. When trading in the polar regions it is essential to know how the equipment will be affected and its limitations. It has to be evaluated if any additional equipment is needed.

## GNSS

---

Satellite navigation system use is limited in the polar regions due to the low angle to the horizon that can prevent reception of a sufficient number of satellites to obtain an accurate fix. Other limitations include scintillation that disrupts radio signals caused by magnetic and ionospheric storms as well as jamming and spoofing of GNSS signals causing service disruption. Integrated GPS/GLONASS/SBAS systems combined with eLoran and future technologies will help to lessen some of these effects. Work in developing receiver autonomous integrity monitoring (RAIM) technology that monitors deformation of GNSS signals using both space-based and ground-based (including ship-based) augmentation systems, will also enhance the future reliability and accuracy of these systems.

## Echo Sounding

---

The advancement of forward looking sonar technology in increased resolution and range should result in the ability to maintain an effective watch below the waterline in much the same fashion as radar aids enhance situational awareness of the bridge watch above the waterline. Current range limitations of 1,000 meters are expected to increase to 1,600 meters and beyond in the near future, while signal strengths and operating frequencies are maintained at levels that do not adversely affect marine mammals. Better integration into ECDIS will further enhance the utility of these systems. High resolution three-dimensional forward looking sonar data can also supplement traditional hydrographic surveys to expand knowledge of bottom features and topography to enhance nautical charts. As bottom features become better known and their positions charted with greater accuracy, feature-based navigation using forward looking sonar will become more viable thereby lessening the dependence on navigating using GNSS technology as a primary means of geo-referencing.



## e-Navigation

---

Navigation in the polar regions is hampered by the inability to place physical aids to navigation along channels and to mark hazards to navigation due to the constant movement of ice. The implementation of electronic (or virtual) aids to navigation (e-ATON) will provide necessary infrastructure in areas where none exists today. This can be accomplished using AIS-based aids where a physical VHF transmitter can be placed within the line of site of the intended e-ATON location. In the future it should also be possible to create e-ATONs in real time using forward looking sonar and GNSS/other positioning technology for display on ECDIS, eliminating the need for physical transmitters and enabling their use throughout the polar regions. e-ATON data can also be rapidly shared with other vessels transiting these same routes, further enhancing navigation safety.

## Navigation Systems

---

Improved accelerometer and gyro technology, as well as algorithms to measure ship movement, will supplement GNSS signals to better maintain positioning accuracy. As their size and cost decrease through their expanded use in both military and civilian applications, these systems will become integrated with ship navigation systems providing redundancy and further enhancing safety margins.

# International Regulations

To regulate the polar regions, new rules have been introduced by the IMO called the *International Code of Safety for Ships Operating in Polar Waters* (the Polar Code). This code has not yet been completed.

This code will become mandatory through:

**SOLAS** (Safety of Life at Sea) safety requirements in the polar regions.

**MARPOL** (Prevention of Pollution from Ships)

The environmental requirements that need to be complied with in the polar regions.

**STCW** (Standards of Training, Certification and Watchkeeping) guidance and recommendations for training and competence of officers sailing in the polar regions.

## IMO Polar Guidelines

which are not mandatory but advisable to adhere to:

- ▶ Only ships with Polar Class designation, based on IACS Unified Requirements for Polar Class Ships, should operate in polar waters
- ▶ Or comparable alternative standard of ice-strengthening

## MARPOL requirements

Antarctic –zero discharge protection

### MARPOL Annex I

Control of discharge of oil and reception facilities

Prohibits any discharge into the sea of oil or oily mixtures from any ship in the Antarctic area; requires adequate reception facilities.

### MARPOL Annex II

Control of discharge of residues of noxious liquid substances

Prohibits any discharge into the sea of noxious liquid substances or mixtures containing such substances in the Antarctic area.

### MARPOL Annex V

Disposal of garbage

Prohibits the disposal into the sea of all plastics and all other garbage; requires reception facilities, with special rules for the Antarctic area.

## Other MARPOL requirements

Prevention of oil pollution in polar regions

– Use and carriage of heavy grade oil

New chapter 9 of MARPOL Annex I, establishing a ban on the use and carriage of heavy grade oils in the Antarctic area, entered into force on 1 August 2011.

## Recommended additional information for trading in the polar regions

Remoteness from SAR facilities – Guidance for passenger ships operating in areas remote from SAR facilities (MSC.1/Circ.1184)

Enhanced planning arrangements for ships operating in remote areas, including close cooperation and liaison with relevant RCCs.

Guidelines on voyage planning for passenger ships operating in remote areas (A.999(25)) Recommends additions to voyage and passage plan, such as details on ice and ice formations, ice navigators, operational limitations due to ice, safe distance to icebergs, carriage of special or enhanced equipment.

## Cold water survival

- ▶ MSC.1/Circ.1185 –Guide to cold water survival
- ▶ Advice on how to prevent or minimize hazards of cold exposure, including self-help techniques
- ▶ Useful checklists for cold water survival and for rescuers

## Recommendations for ships operating in polar water

- ▶ 2002 - MSC/Circ.506 – Guidelines for ships operating in Arctic ice-covered waters
- ▶ 2009 - A.1024(26) – Guidelines for ships operating in polar waters



## Summary

To trade in the polar regions the vessel and crew are exposed to completely new challenges and risks that do not occur in normal open water sailing:

- ▶ In the polar regions the temperatures can be as low as -50°C,
- ▶ There are floating growlers and icebergs which are as hard as concrete,
- ▶ The waters are not surveyed satisfactorily,
- ▶ Pollution will be extremely difficult to clean-up,
- ▶ Salvage equipment may not work in freezing temperatures,
- ▶ It is physically exhausting to work in low temperatures.

If the shipowner deems these factors suitable it is essential the operation is planned accordingly.

To be able to address the issues in the polar regions, the shipowner needs to assess the specific risks, what assistance is available, how equipment will be affected and its limitations. There needs to be a contingency plan if the vessel suffers ice damage. If a casualty should occur in the polar regions assistance will be limited because of the lack of infrastructure. A minor incident can become a serious casualty which could endanger the vessel, its crew and the environment.

There is a concern that the complicated environmental issues with darkness and low temperatures during the winter months will complicate the operation and especially complicate a salvage or clean-up operation.

The Swedish Club supports all efforts to improve the standards and requirements for preventing pollution in the Arctic and Antarctic. It is encouraging to see that the Arctic Council has this as one of their top priorities. Hopefully harmonized regulations in the Arctic will make it easier for

shipping to assess the risk and plan the operation accordingly. This and the improvement in the infrastructure in the Arctic will be essential for a successful outcome, especially as shipping in the Arctic is anticipated to increase.

The Polar code created by the IMO will address many of the issues which shipping encounters in the Arctic but it is a worry that this code will not address all concerns. If this will be the case it is essential that the Arctic countries and the shipping industry addresses these issues themselves.

Regarding insurance cover, the shipowner has to inform The Swedish Club if we are the hull underwriter, but it is also essential to inform us as per the P&I policy as the risks in the polar regions will greatly affect the P&I exposure.

The development of the Polar Regions is essential and of interest for the entire shipping sector. It is vital that this is being done correctly and that risks are addressed correctly. This is a relatively new area for international and commercial shipping and it is important that there are proper regulations to govern how shipping is conducted in this region. That regulations are harmonized for the entire Arctic is essential. This will make it easier for shipowners, insurers and operators with interests in this region to plan and execute the operation in the best way to protect property, environment and life.

Trading in the Polar Regions can be done safely, but for this to happen the risks need to be assessed correctly. A harmonized ice-regime between the different arctic countries is likely to be the best regime to monitor shipping and enhance safety in the Arctic.

For further questions or feedback please contact our Loss Prevention department.



*The shipowner must inform their Hull underwriter and P&I club before trading in the polar regions.*

## Loss Prevention

The Loss Prevention unit is placed within Strategic Business Development & Client Relationship and provides active loss prevention support, analysis, reports as well as advice to members.



**Lars A. Malm**

Director, Strategic Business Development & Client Relationship

Telephone: +46 31 638 427

E-mail: [lars.malm@swedishclub.com](mailto:lars.malm@swedishclub.com)



**Joakim Enström**

Loss Prevention Officer

Telephone: +46 31 638 445

E-mail: [joakim.enstrom@swedishclub.com](mailto:joakim.enstrom@swedishclub.com)



**Anders Hultman**

Loss Prevention, Project Coordinator

Telephone: +46 31 638 426

E-mail: [anders.hultman@swedishclub.com](mailto:anders.hultman@swedishclub.com)

## Thank You!

We would like to thank Åke Rohlén at Arctic Marine Solutions and Glenn Wright at GMATEK with their valuable assistance and input about trading in the polar regions.

## Contact

### Head Office Gothenburg

Visiting address: Gullbergs Strandgata 6  
411 04 Gothenburg

Postal address: P.O. Box 171

401 22 Gothenburg, Sweden

Tel: +46 31 638 400, Fax: +46 31 156 711

E-mail: [swedish.club@swedishclub.com](mailto:swedish.club@swedishclub.com)

**Emergency: +46 31 151 328**

### Piraeus

5<sup>th</sup> Floor, 87 Akti Miaouli, 185 38 Piraeus, Greece

Tel: +30 211 120 8400, Fax: +30 210 452 5957

E-mail: [mail.piraeus@swedishclub.com](mailto:mail.piraeus@swedishclub.com)

**Emergency: +30 694 453 0856**

### Hong Kong

Suite 6306, Central Plaza, 18 Harbour Road,  
Wanchai, Hong Kong

Tel: +852 2598 6238, Fax: +852 2845 9203

E-mail: [mail.hongkong@swedishclub.com](mailto:mail.hongkong@swedishclub.com)

**Emergency: +852 2598 6464**

### Tokyo

2-14, 3 Chome, Oshima, Kawasaki-Ku,

Kawasaki, Kanagawa 210-0834, Japan

Tel: +81 44 222 0082, Fax: +81 4 4222 0145

E-mail: [mail.tokyo@swedishclub.com](mailto:mail.tokyo@swedishclub.com)

**Emergency: +81 44 222 0082**

### Oslo

Tjuvholmen Allé 17, 0252 Oslo, Norway

Tel: +47 9828 1822

E-mail: [mail.oslo@swedishclub.com](mailto:mail.oslo@swedishclub.com)

**Emergency: +46 31 151 328**