



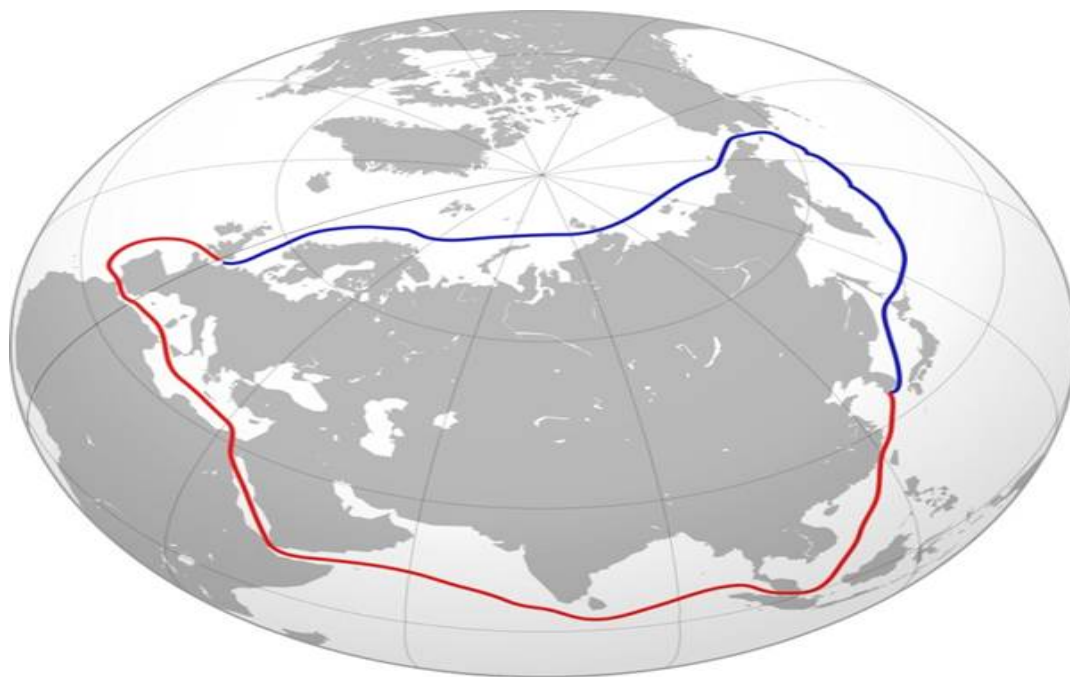
## **Climate change creates a new trade route - and new risks**

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For hundreds of years, explorers searched for the North-West (NW) Passage – a trade route across northern Canada to Asia – but it was not until the early years of the 20th century that the Norwegian explorer, Roald Amundsen, successfully navigated through this passage.

However, the NW passage is limited in its use to commercial shipping. In recent years, the changing climate has meant that the polar ice in other parts of the Arctic has, to a considerable extent, melted, giving access for commercial shipping to the Arctic basin and its coastal seas. This has created a new trade link between the continents, known as the North East Passage or the Northern Sea Route (NSR). This route, which is a northern shipping lane between the Pacific and Atlantic Oceans, was in fact first navigated in its entirety by the Finnish-Swedish explorer Nordenskiöld as part of the Vega expedition in 1878. The route is generally open during late summer and autumn and runs along the northern coast of Russia, before emptying into the Bering Strait and Pacific Ocean. While the development of the NSR creates some interesting opportunities for commercial shipping, from an insurer's point of view, it also involves some significant risks. We will take a look at the risks involved in this article.



## **Regulations applicable to the NSR A**

Almost the entire transit corridor lies north of the Russian Federation. Marine transportation along the Northern Sea Route is governed by Russian legislation which is based on the principles of the UN Convention on the Law of the Sea (UNCLOS), and in particular Article 234 of the Convention that concerns “Ice-covered Areas”. It can be argued that Article 234 authorises the coastal states, in this case Russia, to adopt and enforce laws and regulations for the prevention and monitoring of marine pollution from vessels. It also defines the basis for the system of fees adopted by the Russian authorities. Additionally, according to UNCLOS, Russia has jurisdiction within the Exclusive Economic Zone (EEZ) off its mainland and islands as illustrated below.

*Source: [www.arctic-research.com](http://www.arctic-research.com)*

In the summer of 2012 the Russian Federation adopted a new federal law applicable to vessels using the NSR. The new law regulates NSR traffic and includes, inter alia, the following:

- Fees for using the route.
- Restrictions on and obligations of the transiting ship, such as the need for assistance from an ice breaker.
- Compulsory liability insurance.
- Obligation to have an ice pilot on board.
- Formal authorisation procedure needed by the NSR administration.
- How to communicate by radio as well as hydrographical information.
- How to organise search and rescue operations.
- Rules covering additional equipment required on board the transiting vessel.

### **NSR and insurance issues**

The International Sea Route Programme (INSROP 1993-1999) was one of the first attempts to identify the insurance risk aspects of the NSR, which was followed by the Arctic Operational Platform (ARCOP 2003-2006). The research carried out by INSROP concluded that insurance claims arising from arctic operations would be higher than those in southern waters, particularly with regard to salvage/wreck removal and pollution response. In 2009 the Arctic Council presented their report 'Arctic Marine Shipping Assessment 2009 Report'. This report concluded that: 'Except in limited areas of the Arctic, there is a lack of emergency response capacity for saving lives and for pollution mitigation. There are serious limitations to radio and satellite communications and few systems to monitor and control the movement of ships in ice covered waters. The current lack of marine infrastructure in all but a limited number of areas, coupled with the vastness and harshness of the environment, makes conduct of emergency response significantly more difficult in the Arctic.' One of the main problems for the insurance industry is the lack of reliable statistical data which makes it difficult to prepare an overall risk assessment of arctic voyages. However, according to the limited data available, most of the hull damage has occurred in the eastern NSR due to more difficult ice conditions. Poor visibility is also an important issue here. Both the Nordic Insurance Plan as well as the English Institute Warranties 1/7/76 (and the International Navigating Conditions 1/11/2003) exclude arctic waters. Hence, Hull & Machinery insurance ceases if a ship proceeds into an excluded trading area unless the underwriters have given prior permission. As P&I insurance is compulsory for transiting the NSR, as outlined above, underwriters' permission is a requirement of the Russian Authorities before they grant permission to sail the NSR route. Generally, a vessel with hull & machinery cover in GARD and which is about to use the NSR should have:

- Baltic Ice class 1A or equivalent (0.8 m maximum thickness of broken ice)
- Assistance from an ice breaker from Atomflot during the entire voyage
- Salvage assistance from icebreakers, free of charge, during the entire NSR
- Compliance with CEFOR Arctic Sailings Checklist
- Well prepared and equipped ship and crew to perform a safe voyage
- Owner's own risk assessment for the voyage with updated ice/weather information

Classification societies may have different ice class notations, and ice class is not part of the main class. It is a voluntarily additional class. The classification societies' rules as such do not regulate the way in which a vessel may be operated in ice infested areas. This means that the vessel's class will not be withdrawn or suspended if the vessel is operating in ice conditions for which it is not designed. Hence, there will be no ground for arguing that a vessel's insurance cover is prejudiced because it has lost its class. There is therefore a general need for insurers to evaluate the risk and set requirements with regard to the vessel's ice class, winterization and general suitability to trade in ice and cold climates in particular. Unlike H&M underwriters, P&I clubs do not generally impose any trading limits in their policies. However, if transiting the NSR does not fall within a vessel's normal trading pattern the P&I Club should be consulted and notified beforehand. Gard's Rule 7 (Alteration of Risk) requires that Members notify the Association of any circumstances that may alter the risks covered by the Club. For reasons described below, arctic voyages may well represent an alteration of risk.

### **Challenges for navigation in the Arctic**

Navigating in the arctic presents some unique risks and challenges. AIS tracking of vessels in the area show that almost all vessels are subject to deviation from direct routes as a result of ice. Many areas cannot be navigated safely without the presence of large powerful icebreakers capable of providing assistance such as leading through to clearer/open waters. Thus, when evaluating the NSR the following uncertainties/circumstances have to be borne in mind:

- Possible harsh and fast-changing conditions and less reliable weather forecasts than most other places.
- Restricted visibility up to 90% of the time.
- Is the ship is suitably constructed or adapted for trading in ice (ice class and winterization) and the crew ice trained for the possible challenges, including trading in ice and the ability to operate in low temperature?.
- Challenges with insufficient charts – ensure that the latest updates are available.
- Challenges of inadequate and old hydrographic surveys for the area, making chart data quality poor.

- Navigational challenges: GPS and GLONASS positioning might give a certain error, and compasses (both magnetic and gyro) are unreliable in high latitudes.
- Navigational challenges: For GNSS (GPS, GLONASS and Galileo in the future), the performance in the Arctic region is reduced compared to the performance obtained by users at mid latitudes. The reasons are mainly the satellite-receiver geometry and the ionospheric effects on the satellite signals, but also the fact that users do not have the benefit of satellite based augmentation systems (SBAS) on a larger scale. Other factors contributing to reduced safety in the area are rough weather, drifting sea ice and ice bergs, the remoteness of the area, poor maps and charts, lower accuracy of magnetic and gyro- compasses etc. All of the above issues make positioning and navigation in the area difficult.)
- Limited access to communication links. In many areas VHF or MF is the only way to communicate. VSAT is expected to work in up to 75 degrees latitude, but in reality very often ceases to work around 71 degrees. Additionally, only short size messages can be transmitted due to limited bandwidth if any at all.
- Lack of reliable ice and weather forecasts and the means to obtain such information on board.
- The emergency response infrastructure is largely under-developed. This may make an emergency response complicated and expensive, since people and equipment will probably have to be brought to the site – which could be extremely remote – from outside Russia. Additionally, there is a significant lack of resources, no repair facilities and limited salvage equipment along the route. There are no deep water quays or safe havens, and a smaller incident may therefore well develop into a major casualty.
- Logistical problems for the delivery of spare parts. There are very few ports where spare parts can be obtained or flown in.
- The extent to which the Russian Authorities will allow and facilitate the involvement of professional foreign salvors is uncertain.
- Communication in a distress situation may be a challenge as much of the communication is likely to be in Russian via the Russian ice breaker.
- Due to the remoteness, even towage to repair yards may be challenging.

## **Casualty response**

The NSR is both an ecologically sensitive and extremely remote region. Although the level of traffic is still relatively limited, both these aspects are of concern to insurers, as they increase the risk that an incident or casualty involving a vessel using the NSR could lead to serious consequences.





One of the main risks and challenges from a casualty perspective is the need for salvage services and at worst, the potential of a wreck removal. The combination of extreme cold conditions, ice, remoteness and lack of available 'winterised' assets creates particular challenges. Although a vessel may be assisted by an ice breaker, which may have some emergency equipment on board, it should be remembered that an ice-breaker's purpose is to break ice, not to provide salvage services. While towing a vessel whose main engine may have failed might, in extremis, be possible, such vessels are unlikely to have either the equipment or training and experience necessary to carry out a more complex procedure, such as the removal of bunkers. Personnel and equipment will, therefore, have to be brought in from abroad, sometimes to extremely remote and inhospitable locations. Bearing in mind the fact that the mobilisation time could well be considerable, there is concern that an "ordinary" machinery failure might end up as a wreck removal.

Due to the extreme weather conditions, a wreck removal is likely to be very dangerous as well as expensive, if at all possible. This is illustrated by the PETROZAVODSK which ran aground at Bear Island, right in the middle of a major breeding area for large sea bird colonies, in May 2009. The vessel had nearly 60 cubic metres of oil as well as other petroleum substances on board, out of which an unknown amount leaked into the ocean. Reports indicate that in late summer of 2009 the residues were pumped out, suggesting that what was left behind in the vessel was a small quantity only. The Norwegian Coastal Administration inspected the wreck and concluded in 2011 that a removal could not be done for safety reasons.

If a grounding or collision occurs, there is often a serious threat of oil pollution, as in the PETROZAVODSK case. This is particularly problematic in the arctic since cold temperatures and ice will affect the behaviour of oil in many different ways. For example, extreme cold will make the oil more persistent, while fast ice may encapsulate the oil within the ice or the oil will become trapped underneath the ice. [1] Moreover, the movements of oil trapped in highly dynamic pack ice can be considerable and unpredictable. Additionally, the oil may become frozen in over the

winter and then appear again next spring.

Detecting oil in icy waters is also difficult. Traditional techniques such as aerial surveillance will be difficult in the arctic due to the fact that there is no daylight for much of the year. While most of the traffic passes through in the short northern summer when it is light for almost 24 hours, in 2013, the last passage took place in late November. Radar remote sensing is limited in that the ice leads have to be large enough for wind generated waves to occur. Furthermore, in order to effectively use remote satellite sensing to detect an oil spill the sky has to be clear, which is normally not the case in the Arctic. Air borne sensors can be used even when it is cloudy, however, the availability of aircraft and pilot in the Arctic is far from abundant. Similarly, chemical sensing would require pilots and low flying aircraft.

The possible use of dogs has recently been investigated by SINTEF.[2] Research has proven that properly trained dog are able to reliably detect relatively small volumes of oil. However, the number of trained dogs along the NSR is most likely limited and the working environment is a challenge for both man and his best friend.

One of the most promising technical developments is ground penetrating radar (GPR). This is being developed for the detection of oil under ice, and can be airborne or surface-carried. For airborne units, a low flight altitude is required. Greater penetration is possible using surface-carried units, but these are large and heavy, and a trade-off must be made between resolution and penetration. Currently, GPR can be used to detect oil accumulations greater than 2.5 cm in thickness, under snow or in/under ice, but is unable to detect thinner oil slicks, or oil trapped under new ice, young ice, first year ice, rafted ice, rubbles or ridges, or ice thicker than 2.1 m (for surface-carried units, or 0.90 m for airborne units).

If and when any spilled oil is found, clean-up/recovery will be challenging. A common method for recovering spilled oil is mechanical recovery and the method is pre-approved both in Russia and Norway.[5] In the Arctic, however, this alternative has to overcome several challenges. First of all, the presence of ice will in many circumstances prevent the use of booms. Moreover the extreme temperature may hinder the use of skimmers and pumps.

Dispersants are sometimes used to respond to oil spills in non-arctic regions. Icy conditions have the effect of possibly increasing the window for using dispersants from a couple of hours in non-icy waters to several days and perhaps even weeks, depending on the level of ice coverage. However, higher ice coverage also means that there might not be sufficient mixing energy in the water and the use of dispersant becomes more complex.

Notwithstanding the apparently positive outcome of some experiments, the application of dispersant is not pre-approved in Arctic waters. Hence, approval needs to be sought from the competent authority. It might be difficult to obtain permission within the relatively limited amount of time available or if the spill takes place in shallow waters, near shore or in an ecologically sensitive region.

Burning might be an option for removing large volumes of oil in situ. The technique was used in response to the DEEPWATER HORIZON incident. The disadvantage is that it requires a certain thickness of the oil slick and not all oils can be burned effectively. In order to create the necessary thickness of an oil slick, chemical

herders can be used to collect the oil. The limited possibility of using fire-resistant booms in icy waters may limit the possibility of in situ burning, although, the ice itself may sometimes have similar effects to that of booms. Other problems with in situ burning are the residues that sink and might have to be recovered, and the fact that in situ burning creates a dense plume of smoke. Lastly, in-situ burning is not a pre-approved response technique for Arctic oil spills. The need to seek approval may significantly delay the spill response.

Moreover, several oil spill response methods create large quantities of waste. The waste handling in remote areas can be even more complex and expensive than the clean-up operation as such. Quantities of waste generated will vary according to the response strategies adopted. For example, containment and recovery of oil, which is a pre approve technique, will generate far more waste than the use of dispersants or in situ burning, both of which remove the oil from the sea surface without collecting it for disposal. Additionally, the major challenges of storage, logistics, remoteness and availability of equipment remain unresolved.

### **What resources are available?**

A key factor in the success of a response in Arctic waters is knowledge of the resources available and co-operation between different countries in the northern regions. Since 1994 an agreement has been in place between Russia and Norway in respect of oil spill response, however, this agreement only applies to the Barents Sea and does not cover the rest of the Northern Sea Route.

The Arctic Council (Canada, Denmark, Finland, Iceland, Norway, Russia, Sweden and the United States) has identified the need to strengthen the co-operation, co-ordination and mutual assistance between the parties on oil pollution and preparedness in the Arctic regions. After years of work and preparations all eight member states signed The Agreement on Co-operation on Marine Oil Pollution Preparedness and Response in the Arctic in May, 2013.

The agreement stipulates that the Arctic countries are required to notify each other if there is an oil spill from any source, anywhere north of the 66th parallel. The Agreement combines duties and obligations of all Arctic countries and each country has made a commitment to equip itself to be able to respond to spills in the region. This also means that they will need plans for how they will respond to a potential spill. Furthermore, Article 6 of the Agreement requires the countries to take 'appropriate steps' to deal with a spill, but without specifying a minimum level for what this might be.

Hopefully the agreement will lead to increased co-operation between the Member states, but also knowledge about what resources are actually available if an incident occurs. However, since a minimum level is not specified in the agreement it does not guarantee that equipment will be available; it only provides a basis for assessing what resources are available.

Some stakeholders hope the fact that the offshore industry has shown an increasing interest in the Arctic territory will bring further resources to the region. Whether their resources will be available for vessels operating in the area is another question since the offshore industry is normally obliged, according to their licenses and permits, to keep resources available on their units in order to be able to arrange a



prompt response themselves.

## **Conclusion**

The problems that a shipowner and his insurer might face, if in need of oil spill/emergency response for a ship using the NSR, are significant and probably as challenging as anywhere in the world. Many of the potential problems are logistical. Apart from having only a few months to conduct any cleaning or remedial work, airstrips are remote, fog and snowstorms can ground workers for weeks at a time and it may be impossible to bring in sufficient vessels, equipment and other resources to assist in the clean-up operation. Any wreck removal can be expected to be expensive and dangerous, if at all possible.

Notwithstanding this, until now, the general approach from P&I underwriters has been to follow hull underwriters if they give their green light for ships to use the route.

Bearing in mind the large number of hull underwriters in the market, it is likely that the approach in relation to NSR voyages will vary. With reference to the various implications and increased risks highlighted in this article, it can be concluded that an NSR voyage may be deemed to represent an alteration of risk under the P&I Rules and terms of entry. Members are therefore advised to inform the Association of any planned NSR voyage well in advance and provide a full risk assessment so as to allow the Association whether and on which conditions it may accept to make P&I cover available for the risks concerned.

[1] Fast Ice is sea ice that is "fastened" to the coastline, to the sea floor along shoals or to grounded icebergs.[2] [http://www.sintef.no/project/JIP\\_Oil\\_In\\_Ice/Dokumenter/publications/JIP-rep-no-14-Oildog-snow-ice.pdf](http://www.sintef.no/project/JIP_Oil_In_Ice/Dokumenter/publications/JIP-rep-no-14-Oildog-snow-ice.pdf)