

## **International Conference “Arctic: Marine Transportation Challenges – 2021”**

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### **Communication of Arctic Marine Transportation opportunities.**

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#### **Keywords**

Marine transportation, Arctic, Northern Sea Route, Clean environment, Emission, Polar Code.

#### **Abstract**

In a risk analysis we identify the causes that could lead to unwanted events/ outcomes. We introduce barriers that will reduce the probabilities of such events and also barriers that will mitigate the consequences of such events.

Regarding Arctic Marine Transportation Challenges, more attention should be placed on communicating all work that is undertaken to enhance the safety and limit the environmental footprint of sailing along the Northern Sea Route.

Training of personnel is, furthermore, undertaken in accordance with the requirements set to obtain Polar Code Certificates, and evacuation, escape and rescue exercises are regularly undertaken by vessel owners having vessels entering the area. Support is available for rescue operations and legal regulations is administrated by the Northern Sea Route Administration. Improved information on ice and ice-flow conditions are made available by an increased number of satellite observations. A steady improvement of all safety related features is ongoing.

It is necessary to identify why the problems and the challenges are highlighted by the commercial actors, while the opportunities and savings are not that clearly presented. This paper will discuss a series of challenges for Arctic Marine Transportation and how these are being mitigated. Recommendations will be given regarding prioritizing of additional mitigation measures. Of key concern is the climate impact where the Northern Sea Route could be presented as a Green intercontinental transportation route in case use of heavy fuel oil is not permitted and by highlighting the support of icebreakers to ensure that schedules for all traffic can be kept and that safety during the transit is of key importance. The total climate imprint of using the Northern Sea Route should be compared to the imprint of sailing alternative routes and be communicated as a key opportunity for sustainable intercontinental sea transportation.

#### **Introduction**

Marine transportation is the main method for transportation of goods and services to communities located in the Arctic. Although some communities can be reached by rail and/ or road transport, the main transport is by ship. Intercontinental shipping, on the other hand, has several options

when selecting routing, one of these options is the use of the Northern Sea Route (NSR) in competition with the use of the Suez Canal route or the route south of Africa. The NSR (see NSR's homepage) is well established with full support by meteorologists and ice specialists as well as technical support by a number of icebreakers, available on request or through compulsory assistance in case of considerable amounts of ice. For the transport of LNG from the Ob Bay facilities, the use of NSR, when this is open for sailing, represents a huge savings of time and fuel. In this respect it should be noted that the use of LNG in the counties in East Asia represents a halving of the CO<sub>2</sub> emission compared to use of coal, provided that the production of LNG is a closed loop process without emission of methanol.

A discussion of technical challenges associated with the use of NSR was presented by Gudmestad (2018), stating that "Risk identification and risk analysis are useful and important tools, if properly conducted. All relevant historical information about the area must be included in the hazard identification", referring to Abramov (1995) and Marchenko (2016). Furthermore, "sustainability is only credible if the utmost care is taken regarding the safety of personnel and reducing the effects on the environment". An optimistic picture regarding the use of NSR was thus presented by Gudmestad (2018) and later by Gudmestad and Bai (2020), although concerns were raised regarding emissions in case heavy oil is used for fuel and in case of rescue of a large number of cruise passengers.

With the introduction of the Polar Code (IMO, 2017), the international shipping community sailing in Polar waters has to respect a set of requirements regarding safety and environmental care, to the benefit of serious commercial companies who will do their utmost to fulfil the obligations in the code. Polar code courses according to IMO STCW requirements (IMO, n.d.) are given by several institutions, among these the Admiral Makarov State University of Maritime and Inland Shipping (Makarov, n.d.). For cruise traffic, the situation is still complex, as large cruise vessels carry a large number of passengers, and rescue may be extremely challenging. However, the IMO has issued a guidance note regarding life-saving appliances to improve on the situation for rescue of personnel, IMO (2019). The guidance note takes the recommendations of Gudmestad and Solberg (2019) into account. These recommendations were based on a series of search and rescue exercises in the waters of Northern Spitzbergen in 206 to 2018. The authorities' continuous evaluation of the ice class requirements and the actual development of the ice conditions are, furthermore, important to secure safe travel in Arctic waters.

## **Materials and methods**

The objective of the paper is to analyze the opportunities for the use of the Northern Shipping Route and point out that the advantages should be communicated in a manner that increases the interests for using the route. Material will be collected from known sources communicated on Internet and by scientific papers. Herein, we will discuss the main mitigation methods to improve the commercial trust in using the route.

## **Results**

The preparation of a sustainable arctic maritime route along the North-Eastern Passage has been given much attention as discussed above, however, setbacks have occurred; the container industry

has become skeptical to the use of the NSR (Arctic Today, 2019), citing both safety and environmental concerns regarding traversing the region. Evergreen was one of the reluctant shipping companies, however, Evergreen did lose credibility this year as the 400 m long Ever Given blocked the Suez Canal for a week and was delayed by several months in Rotterdam after a dispute regarding compensation payments to the Canal authorities (Reuters, 2021). It is also expected that many companies will claim compensation for late arriving goods.

Furthermore, the authorities have become aware of the responsibilities in case of an accident in Arctic waters. In particular has cruise traffic been given much attendance; what is the real time to rescue? (Solberg et al., 2020).

In order to gain general acceptance for the use of the NSR it is necessary to document the real savings to the environment, to time for transit and to the total costs, as well as the safety for the environment, the persons onboard and the ship. The following should be

- The use of heavy fuel that leave black soot on the ice, thereby accelerating the melting process must be abandoned (Harvey, 2016). There are at present discussions in IMO on this matter (IMO, 2020). It may not be immediately realistic that all shipping abandon heavy oil, therefore the mandatory use of light oil or LNG for ships using the NSR may represent a competitive advantage for the NSR. With a slower transit speed than used for southern routes, the fuel consumption could also be limited.
- Uncertainties in arrival time represents an unpleasant uncertainty as container and cargo vessels must book time for loading and unloading at ports. A time slack must be implemented to ensure arrival on time, and the cost effect must be included in the planning. However, the capacity of alternative routes has reached the limit. Ever Given was, in principle, too large to enter the Suez Canal and low under keel clearance and strong winds caused the blockade of the Canal.
- The ice forecast must be improved with even more use of satellites and quick downloading of data. It should be noted that a Norwegian Coast Guard vessel with ice class was admitted to the NSR late 2020 (Barents Observer, 2020) to rescue important research data from the Bering Strait. The Norwegian vessel was commissioned on short notice as the US icebreaker Healy planned for the operation was in for repair. The flexibility by all parties to allow this rescue operation of scientific instruments can serve as an example of a successful use of the NSR in dark conditions when the ice accumulated more and more every day in temperatures around minus 20 °C. Daily communications with Russian authorities and the NSR administration was necessary.
- Some unfortunate accidents have happened along the NSR as vessel operators have violated the NSR safety rules, by using vessels without the required ice class (High North News, 2017). It is of high importance that the NSR Administration cracks down on such violations. Irregular shipping and subsequent accidents, as with Nordvik in 2013 reduce the trust in the use of the route.
- The support available to vessels in transit is a key to success. This relates to transit support by icebreakers and to search and rescue support in case of distress, as well as harbor support for maintenance and repair. As all sort of support is available along alternative routes, the

Russian administration must increase efforts to provide smooth assistance. Herein is included predictive custom clearance regulations and transparent fee calculations for icebreaker support. The NSR will not be attractive if there are doubts that administrative procedures will halt the sailings and port visits.

## **Discussion**

The problems and the challenges of using the NSR for sailing has been highlighted by commercial shipping companies, while the opportunities and savings are not that clearly presented to the international audience. A prioritizing of mitigating the challenges for Arctic Marine Transportation is presented above. Of key concern is the climate impact, where the Northern Sea Route could be presented as a green intercontinental transportation route, reference the concerns of IPCC (IPCC, 2021), by not permitting heavy fuel oil and by highlighting the support of icebreakers to ensure that schedules for all traffic can be kept while still reducing the fuel consumption as compared to the southern routes and by keeping up the safety for ships sailing along the route. The total climate imprint of using the Northern Sea Route should be compared to alternative routes and be communicated as a key opportunity for sustainable intercontinental sea transportation.

## **Conclusions**

Through considerable efforts by the North Sea Route administration, it will be possible to improve the communication of the advantages of the NSR route as a green alternative for intercontinental transportation via the Arctic. The Arctic Marine Transportation opportunities should be highlighted and problems should be communicated as challenges that will be solved. With a decreased ice coverage of the Arctic, it is important that commercial companies are aware of the advantages of using the route. The efforts of the NSR administration and the support to the administration by the government, must however, not be underestimated should the goals for using the NSR be met.

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