This is the English translation of a chapter originally published in Swedish in the *Norden Association's Yearbook* for 2008:

Ragner, Claes Lykke, 'Den norra sjövägen'. In Hallberg, Torsten (ed), *Barents – ett gränsland i Norden*. Stockholm, Arena Norden, 2008, pp. 114-127. (See: www.norden.se)

The Northern Sea Route

By Claes Lykke Ragner[1]

Introduction

The Northern Sea Route (NSR) is the Russian name for what is often known outside Russia as the Northeast Passage (NEP). In Europe, the term *Northeast Passage* has for centuries nurtured visions – that have never completely died out – of an adventurous shortcut that may bring about a revolution in sea trade between Europe and East Asia. In Russia, the term *Northern Sea Route* holds different connotations, and evokes visions of a grand national transport corridor, created by the efforts of the Russian people, and mainly used for bringing natural resources out, and for bringing deliveries in to the many settlements in the Russian Arctic. Since Soviet times, the country has built up an Arctic shipping infrastructure – including most notably the fleet of powerful nuclear ice-breakers – and claims jurisdiction over the route.

The NSR can not be thought of as one clearly defined linear *route*, but should instead be thought of as the whole *sea area* north of Russia. Due to the highly variable and difficult ice-conditions present along most of the NSR, the optimal route choice for vessels navigating the NSR will vary. In this chapter, we will focus primarily on the NSR's potential as an intercontinental transit route, while briefly also touching upon its other functions.

A look at the globe shows how the NSR can offer great savings in distance – and thus potentially also in time and expenses – for transport between Europe and East Asia, with no countries being more conveniently located than the Nordic ones. In theory, distance savings can be as high as 50% compared to the currently used shipping lanes via Suez or Panama. This attractive fact has always been present – to a higher or lesser degree – in the mind of the shipping community all since the first discoverers went out to search for this Arctic short-cut five centuries ago.

Ice has however so far been an insurmountable obstacle to commercial transit traffic, but in recent years, strong scientific evidence has shown that the Arctic ice cover is diminishing, both in thickness and extension. This is believed to be caused by climate change, and if current trends continue, the NSR will probably become a commercially viable transit route – eventually. This outlook has over the last couple of years led to yet a new wave of interest in the potential of Arctic shipping routes.

[1] Claes Lykke Ragner is Head of Information at the Fridtjof Nansen Institute at Lysaker outside Oslo. He was also led FNI's secretariat for the International Northern Sea Route Programme (INSROP). See *www.fni.no*

History

The discovery and conquest of the Northeast Passage

As European colonial powers expanded their empires and trading routes into East Asia in the 16th Century, the search for alternative, shorter seaways to Asia began in earnest. Several expeditions – mainly organized by Great Britain and the Netherlands – were sent out to the Russian Arctic in search of a route they had named the Northeast Passage.

These expeditions managed to map much of the western part of the NEP, but were all either wrecked or forced to return by the difficult ice conditions. Thus, it was not until 1879 that the NEP was "conquered", when the Finnish-Swedish explorer Adolf Erik Nordenskiöld reached the Bering Strait onboard the steamer *Vega,* after having carried out a full passage from Europe, spending one winter along the way.

Nordenskiöld was however not at any point along his journey the first European to have passed. Already more than 200 years earlier, a succession of Russian expeditions had mapped the Arctic shores of the Eurasian continent. These had entered the Arctic Ocean by descending the great Siberian rivers such as the Ob, Yenisey, Lena and Kolyma. The Russian expeditions were not primarily organized to find a transit route, but were motivated by Russian desire to extend its sovereignty further to the east and north, and to expand the profitable fur trade with local, indigenous peoples.

Nordenskiöld's passage trough the NEP was a great historic achievement, but Nordenskiöld himself doubted whether his passage would have any impact on world trade patterns. He considered the sailing conditions along the eastern part of the route to be too difficult for commercial usage. On the other hand, he was much more optimistic about the prospects for a trade route between Europe and the estuaries of the great Ob and Yenisey rivers in the Kara Sea.

Nordenskiöld's predictions proved to be accurate. While no one attempted to use the NEP for trade with Asia, from around the time of Nordenskiöld's transit, sporadic trade voyages started on what became known as the Kara Sea Route. Norwegian sealers also started coming to the Kara Sea around this time, making considerable contributions to opening up the area for commercial navigation.

The Soviet era: Developing the NSR

The relevance of the NEP as an international transit waterway further diminished after the Russian Revolution in 1917, after which access to the Russian Arctic became restricted for non-Soviet vessels. The Soviets, however, made efforts to further develop the Kara Sea Route, first in the 1920s when the route was used to transport food during an outbreak of famine in Northern Russia. From that time on – and especially from the 1930s – the Soviet Union gradually developed the entire Northern Sea Route as an internal waterway, in support of the industrial development of its Arctic resources. Industries were established in Igarka, Norilsk, Khatanga and in other areas, largely by the use of forced labour, and port facilities were constructed. In 1932, a large bureaucracy – the *Glavsevmorput* – was established to administer not only the Northern Sea Route, but all economic activities in the Russian Arctic.

To the Soviet Union, the NSR also had a military role. When the Pacific and Northern fleets were established in 1932/33, the Northern Sea route was seen as the link that could bind these two navies together, when needed. The theory was proven right when a detachment of warships was transferred from the Pacific to the Barents Sea in 1942. The route also played an important wartime role in transporting armaments and supplying the Arctic regions. After the war, the route became an integrated part of Soviet Cold War strategic plans, which also explains why the route was kept firmly closed to foreign vessels.

The NSR was also an important and integrated part of the Soviet Arctic infrastructure and economy, and was increasingly used for deliveries to the many indigenous, industrial, military and scientific settlements in the Arctic, as well as an export route for timber, ores and other products. In 1978, the first all-year route was initiated between the Yenisey port of Dudinka and Murmansk, transporting metals and ores from the Norilsk industrial complex, with ice-breaker escort during the winter season. Since the 1970s, the NSR has also been used as an important supply line for the development of Russia's northern oil and gas industry.

NSR activity was at its peak in 1987, but as the Soviet system started to crumble, it soon became difficult for the state to uphold the high level of subsidies that was required to maintain most activities in the Arctic, and NSR cargo volumes diminished.

Simultaneously, as part of policies to open up the Soviet Union, President Mikhail Gorbachev in 1987 proposed to give foreign vessels access to the NSR. This initiative eventually resulted in the formal opening of the NSR to non-Soviet vessels on 1 July 1991, only a few months before the Soviet Union was dissolved.

The post-Soviet years: More knowledge, less interest

Hopes were high that international shipping would rally to use the now opened NSR, and that this would provide much-wanted hard currency, as foreign vessels would have to pay fees to use Russian ice-breakers and infrastructure. However, little happened. In spite of a certain degree of interest in the route's potential, the international shipping industry did not feel it knew enough about the NSR, and was not willing to commit vessels or investments in an unknown area with perceived high operational, political and commercial risks. More knowledge was needed. Following Russian initiatives, a large Russian-Norwegian-Japanese research programme was established in 1993 to make investigations into all areas of relevance to international shipping along the NSR. The International Northern Sea Route Programme (INSROP) continued up to 1999, producing a wealth of new knowledge about the NSR, in addition to opening up the doors to a lot of information that had previously not been available outside Russia.

INSROP did an important job in familiarizing the world with the NSR. It showed that there is a potential for increased regional traffic. It also showed that there is a considerable cargo base for transit operations, and demonstrated the technical feasibility of NSR transit shipping. However, comparing the NSR with the traditional Suez Canal route, the research also showed that 'ordinary' transit traffic would not be commercially viable under current economic and climatic conditions.

First of all, costs of building and operating ice-strengthened vessels suitable for the NSR, are considerable higher than of ordinary vessels. Secondly, NSR vessels have severe size restrictions, and economies-of-scale cannot be realized. Maximum draft is 12.5 m due to the

shallow and often unavoidable straits between the New Siberian Islands, and maximum beam is 30 m, as vessels cannot be wider than the ice-breaker in which path it must sometimes follow. This restricts NSR vessel size to around 50,000 dwt – much smaller than vessels that can use the Suez Canal route. Thirdly, while punctuality is essential for most types of intercontinental shipping, NSR shipping would never be able to run on schedules as ice-conditions are unpredictable, even during the short summer season. Finally, there was the problem of the high cost and uncertain availability of Russian ice-breaker assistance. As a result, for the time being, the international shipping industry lost interest in the NSR as a transit route.

Recent state of affairs

Traffic

At its peak in 1987, almost 7 million tons of cargo was moved along the NSR, most of it goods transported to or from Russian Arctic ports. After the Soviet Union's disintegration, volumes gradually fell, before having come to a relatively stable level of 1.5-2.0 million tons per year since 1996. This excludes the considerable oil export from around the Barents Sea – an area outside the formal Russian definition of the NSR (and consequently not included in its NSR statistics). Today, three distinct cargo flows dominate sea transport in the Russian Arctic:

- The traditional export of ores and processed metals from the Norilsk industrial complex via the Yenisey river to Murmansk and beyond – a highly profitable activity.
- Oil and gas exports. This rapidly increasing traffic takes place from the Barents and Western Kara Seas westwards. This is also a highly profitable activity. Since 2000, small tankers have transported gradually increasing volumes of oil from the new Varandei terminal on the Pechora coast, with most shipments going directly to Western Europe. In addition, since 2002 a new export route with oil shipments from several White Sea ports to Murmansk and Western Europe has developed, with oil shipped to the ports by rail. Volumes are expected to keep rising, when the Varandei terminal is completed and new Arctic oil-fields and terminals are developed.
- Import of food, fuel, building materials and other necessities for the Arctic settlements. The state continues to carry out their heavily subsidized deliveries, much of it organized through the annual 'Northern Deliveries Campaigns'. All modes of transport are used, including sea transport. Most of the seaborne deliveries to settlements on the northern coast originate in Murmansk and Arkhangelsk.

Other traditional cargo flows, such as timber and coal export from Siberia, have greatly diminished or disappeared.

As for transit traffic, there was a burst of Russian cargo vessels transiting the route in the years 1989-1995. This was caused by special exchange rate conditions, and when these normalized, transit traffic stopped. Since 1997, there have been no cargo vessel transits, except one isolated occurrence in 2001. Around the turn of the century, Japan considered using the NSR to transport its reprocessed nuclear fuel from reprocessing facilities in Europe, but those plans seem to have been abandoned. While there have been transits by research vessels, military vessels and even yachts, it is notable that there has not been one single 'ordinary', commercial transit by a non-Russian vessel since the route was opened in 1991.

Infrastructure

Russia has the world's largest fleet of ice-strengthened vessels, created mainly for the purpose of supplying and servicing the country's Northern settlements, including the export of Northern natural resources. The country also has the world's largest and most powerful ice-breaker fleet, including the world's only seven active nuclear ice-breakers and several strong diesel-electric vessels. These nuclear ice-breakers remain federal property but are all leased to the Murmansk Shipping Company under special agreements. Not only mighty state symbols, ice-breakers became a prerequisite for establishing and maintaining many of the industrial, scientific, and military settlements of the Russian North. Without the ice-breakers, supplying many of the isolated northernmost settlements would be unfeasible, and Russia would also be less capable of exercising sovereignty and control of its Arctic waters.

With few exceptions, the quality and quantity of the sea transport "hardware" – cargo vessels, ice-breakers, and ports – deteriorated seriously throughout the 1990s, with little maintenance and very little new construction. The number of Russian cargo vessels of medium or high ice-class has dropped continuously since 1993. However, since the need for domestic transport has also fallen considerably, transport capacity has been sufficient to cover most needs, and many of the Russian shipping companies have directed part of their Arctic fleets to more profitable international trade.

The first concrete step to rejuvenate the Russian Arctic fleet was taken by the oil company Lukoil, which ordered ten new ice-class tankers between 1997 and 2002. As plans for developing oil-fields in north-western Russia and Sakhalin progress, other Russian companies have also started ordering larger ice-class tankers.

The ice-breaker fleet is also ageing, with most of the fleet dating from the 1970s and 1980s. After the *Yamal* joined the fleet in 1993, it took 14 years until another major ice-breaker – the *50 Let Pobedy* – was launched in 2007, more than 20 years after its construction started. No other major ice-breakers are currently under construction, and no concrete plans to start such construction have been announced. While refurbishing efforts have been made to enable the nuclear ice-breakers to operate beyond their normal service-life, several of the remaining ice-breakers will inevitably be decommissioned within the coming decade. Since the planning and building of a new generation of large (nuclear) ice-breakers can be assumed to take at least ten years from the decision is taken, it seems obvious that Russia's ice-breaker fleet will shrink considerably before it may grow again.

At the moment, the ice-breaker fleet is largely capable of fulfilling needs in the Russian Arctic, but while capacity is bound to diminish, the need for ice-breaker services will increase as petroleum activities and transport increases in the Barents and Kara Seas. In a not-too-distant future, needs will surpass capacities.

The major commercial players in the Russian north – the petroleum companies and the Norilsk Nikel company – have seen this problem coming, and have acted on their own. The petroleum companies have ordered their own, smaller ice-breakers to service their installations and tankers in the Barents Sea, and Norilsk Nikel is building a small fleet of strong, ice-breaking cargo vessels, rendering the company almost independent of ice-breaker assistance.

When the ice-breaker fleet no longer is capable of servicing all needs, the 'looser' will probably be the northern settlements, in particular those along the eastern part of the NSR, which are the most difficult, and most expensive, to supply.

The lack of ice-breaker capacity will furthermore make NSR transit traffic more unrealistic, at least in a short- and mid-term perspective. Even though a prerequisite for commercial transit traffic is that cargo vessels must be able to operate largely without costly ice-breaker assistance, it is paradoxically also necessary that a minimum ice-breaker capacity is available in case of emergencies and extreme conditions.

Jurisdiction and regulations

Russia today claims formal jurisdiction over the NSR, based on Article 234 of the UN Convention on the Law of the Sea. This article gives coastal states the right to unilaterally adopt and enforce non-discriminatory laws and environmental regulations in their exclusive economic zones where ice coverage and particularly severe climate conditions cause exceptional hazards to navigation, and where pollution could cause major harm to the ecological balance. The Russian regulations set out that all vessels wishing to enter the NSR (*including* all areas within Russian 200 n.m. exclusive economic zone) should give notifications to the Russian authorities beforehand. They must also submit an application for guiding, and pay a set fee to use the route – often referred to as the 'ice-breaker fee'. Russia also claims the straits within and between the Russian Arctic archipelagos and the mainland as part of its internal waters. Other countries have more or less accepted Russia's *de facto* control of these waters, and have not challenged the regime Russia has put in place, except for the US which maintains that the straits should be considered international straits, and thus open to transit passage.

Russia's mandatory ice-breaker fees are high, and the fees are not directly linked to actual services rendered. For instance, during light summer ice conditions, an ice-strengthened vessel may be able to transit the NSR unescorted, but will still have to pay a full fee. The fee system is a major obstacle to transit traffic, and since the opening of the NSR to foreign vessels in 1991, the Russian authorities have yet to design a system that encourages the use of the route even under otherwise ideal conditions.

Russian regulations for operational safety and environmental protection along the NSR are largely adequate, and the actual operational record is also for the most part good. Enforcement measures may however be deficient due to the large areas to be covered and the Russian economy. Most other Arctic states have also adopted strict coastal state regulations, especially Canada, the US and Norway. Furthermore, recent developments, such as stricter ice-class standards by the classification societies and their adoption of unified requirements for polar ships, the introduction of the voluntary IMO Guidelines for Ships Operating in Arctic Ice-covered Waters, and stricter port state regulation in the EU and other nations, are also making it increasingly difficult for sub-standard vessels to operate on the NSR and elsewhere in the Arctic.

The new Arctic

The framework conditions for NSR shipping are changing. In Russia, petroleum activities are moving northwards, and will soon go offshore. At the same time, climate change is having a

strong impact on the extent of Arctic sea ice along the NSR. The increased petroleum activities will lead to unprecedented levels of shipping in and westwards from the Barents and Kara Seas. The diminishing sea ice cover will have even greater impact for shipping, and will have implications for the entire Northern Sea Route.

Climate change: What will it mean to the NSR?

Research results that have been published over the last 10-15 years have consistently shown that the Arctic sea ice has been gradually shrinking and thinning over the last few decades. There are however uncertainties regarding the pace and pattern of the melting, and predictions of future sea ice cover differ greatly. The scenario chosen for the Arctic Climate Impact Assessment (ACIA) in 2004, predicted a largely ice-free Arctic Ocean in late summers in 100 years. More recent and more radical scenarios see the Arctic Ocean ice free in summers already in 30-50 years – but then again there are others models which predict a longer process.

Under the 100-year scenario, ACIA figures indicate that the NSR sailing season will be prolonged from the current 20-30 days to around 120 days. New generations of larger, stronger, ice-strengthened cargo vessels might however be able to operate unescorted for longer than that, and for such vessels, ACIA predicts an average sailing season in 100 years of up to 170 days. Actually, the sailing season might be even longer, as the ice would also be thinner than today and there would be less risk of encountering hard multi-year ice.

As the route gradually opens up in summer, the period when ice free or light ice conditions can be more or less guaranteed, will increase. At one point, if Russia can offer competitive conditions, there might be individual shipowners willing to make occasional use of the transit route, at first perhaps with smaller, moderately ice-strengthened vessels carrying cargoes that are not time-sensitive.

The route would however still be difficult to use for six months of the year, or even more, without the use of intensive ice-breaker assistance. As mentioned previously, punctuality and economy-of-scale are essential for most types of intercontinental shipping, and profitability for *large-scale* shipping will be difficult unless stable, predictable year-round operations can be assured, without much dependence on Russian ice-breaker services. Therefore, while *technically* feasible, it is not likely that large-scale transit operations would become *commercially* feasible even when the North Pole becomes ice-free during average summers.

In addition, the problem of high Russian ice-breaker fees needs to be solved. If not, transit traffic can not get underway until the ice has receded so much that vessels are able to avoid this problem altogether, by crossing the Arctic Ocean north of the Russian economic zone.

Transit traffic through the high seas of the central Arctic Basin however raises the need of firmly establishing a suitable and responsible legal regime for shipping in the area to protect the Arctic environment from discharges, accidents and rogue actors. In addition to the regulations and measures already implemented, a possibility would be to work for the designation of the Arctic Ocean as a special area where discharge of oil, hazardous chemicals and garbage would be largely prohibited. It would also be desirable, when feasible, that Iceland and Greenland bring their coast state regulations on par for example with the new, stricter Norwegian regulations – that could create a barrier across the north Atlantic that would potentially shut sub-standard vessels out from the Arctic Ocean. It could as well be considered whether the now voluntary ice class requirements should be made mandatory. The

question of improved monitoring of Arctic traffic should also be addressed, and mandatory sailing lanes in certain areas could be considered.

Conclusions and predictions

The diminishing Arctic sea ice cover is a fact, while the pace of the process is still uncertain. But the Arctic Ocean is gradually becoming more accessible, and shipping in the region is bound to increase. We are already seeing more regional traffic, mostly related to the development and export of petroleum resources. Other export cargoes, imports to the Arctic settlements and cruise activities may also increase. Later, when the 'summer window of opportunity' widens, occasional transits may be seen. Under the most radical climate change scenarios, it will probably still take around 20-30 years from now until conditions have become suitable for such occasional transits. Large-scale, year-round transit operations are hardly possible before the ice cover has disappeared for most of the year, and this does not seem realistic in at least 40-60 years from now.

Therefore, it is still too early to start making concrete plans for shifting Atlantic-Pacific trade routes to the Arctic. For concerned governments, however, it is not too early to start planning for the reality ahead. In recognition of the ongoing gradual increase of Arctic shipping, and the large-scale transit operations that are likely to get underway some time in the future, processes to address insufficiencies in the current regulatory regime should be initiated, to ensure operational safety and protection of the Arctic environment as well as the livelihoods of indigenous peoples and other northern inhabitants.