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Arctic Maritime Logistics

The Potentials and Challenges of the Northern
Sea Route

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The Northern Sea Route Development: The Russian Perspective



Vasilii Erokhin, Valery Konyshev, Alexander Sergunin, and Gao Tianming

Abstract This study aims to examine what the Russian concept of the Northern Sea Route's development is and how it evolved during the post-Soviet period. The authors conclude that despite some legal inconsistencies, the lack of a proper infrastructure, and residual environmental problems, the NSR will remain an important priority for the Russian future strategy in the Arctic region. The NSR is viewed by Moscow as an effective instrument to develop the Russian Arctic both domestically and internationally. However, Moscow still faces a dilemma: On the one hand, it wants to keep its control over the NSR and support Russian shipbuilding industry and shipping companies. On the other hand, the Kremlin is willing to open up this passage for international cooperation and integrate it to the global transportation system.

1 Introduction

The Northern Sea Route (NSR) is a crucial element of Moscow's national strategy in the Arctic Zone of the Russian Federation (AZRF). In addition to Russian economic interests, there are some geopolitical and security factors which affect the NSR's development and should be paid attention by the Russian decision-makers (Sergunin & Gjørsv, 2020). The Kremlin points out the importance of the NSR's economic and environmental security aspects and the role it plays in ensuring AZRF transport and social cohesiveness.

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According to Russia's vision, the NSR missions include supplying everything needed to the remote AZRF regions and local communities (the so-called Northern supply—supply of foodstuff, consumer goods, and fuel to the northernmost Russian settlements), including the so-called new points of economic growth; export of the products originated from the Russian Arctic to other regions of Russia and abroad; becoming an energy superhighway for export of hydrocarbons and other natural resources of the Russian Arctic; assurance of smooth international transit of cargo; organization of search and rescue (SAR) operations system along the Arctic Ocean's coastline; securing border control over the vast area which became more accessible in view of melting polar ice; guaranteeing quick redeployment of the Northern Fleet forces to various parts of the Arctic Ocean and adjacent seas.

Given the importance of the NSR for Russia, Moscow is constantly adjusting its strategy for this sea route, including the improvements in its legal regulations, decision-making system, icebreaker and pilot services, port infrastructure, navigation and SAR systems, telecommunications, and so on.

This study aims to examine what the Russian NSR development concept is and how it evolved during the post-Soviet period. The chapter starts from an analysis of the NSR physical and economic geography, including its competitive advantages and shortcomings. The next section is devoted to the analysis of the current NSR management system. The special section describes the evolution of Russian policies on the NSR over the last three decades, including legal regulations on Arctic shipping. Finally, Russia's NSR development strategies—past and present—are explored.

2 The Physical and Economic Geography of the NSR

Russia views the NSR as Russia's historically existing national unified transport route which always have been under Moscow's exclusive jurisdiction. According to Russia's normative documents, the NSR lies between the Kara Gate, at the western entry of the Novaya Zemlya straits, and Provideniya Bay, which is a part of the Bering Strait. Its total length is 5600 km (see Fig. 1). In contrast with some common perceptions, the Barents and White Seas, where the Murmansk and Arkhangelsk ports are located, are not integral parts of the NSR legal regime. The NSR includes about 60 straits, the Vilkitski, Shokalski, Dmitri Laptev, and Sannikov Straits are among the main ones. The NSR runs through three large archipelagos such as Novaya Zemlya, Severnaya Zemlya, and the New Siberian Islands. It is difficult to define the NSR legal status because this sea route does not consist of a single shipping channel; rather, there are multiple lanes depending on whether the vessel navigates close to the Russian coastline or chooses to bypass the three above-mentioned archipelagos (see Fig. 2). For this reason, the NSR water area includes waters of different legal status: internal, territorial, and adjacent waters, and exclusive economic zone.



Fig. 1 Northern Sea Route water area and ports

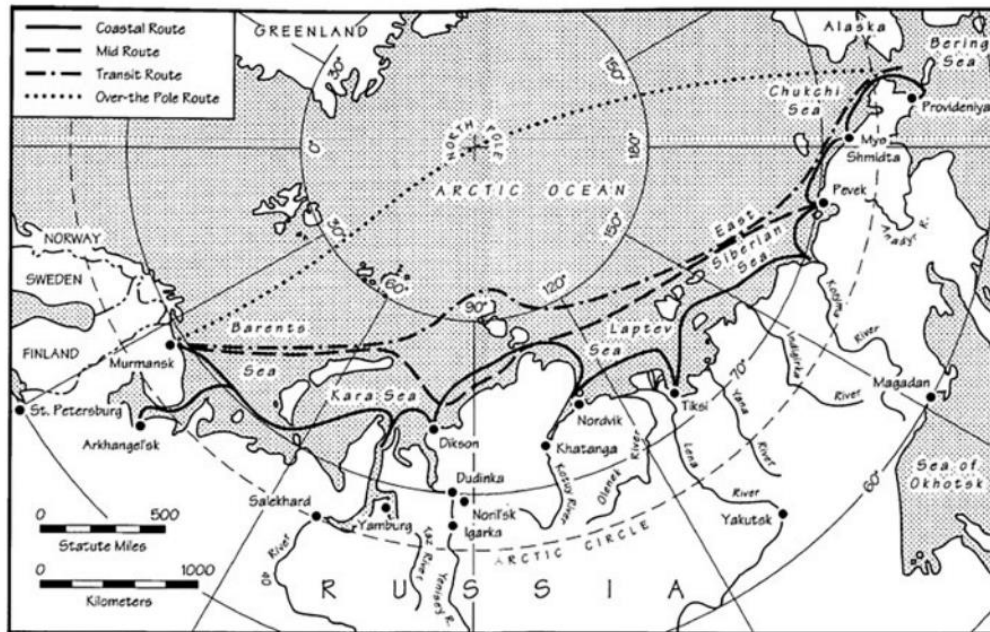


Fig. 2 The alternative “versions” of the Northern Sea Route. Source: <http://www.globalsecurity.org/military/world/russia/images/north-sea-route-map1.gif>

Since the Soviet time the NSR is of vital importance for Russia both economically and socially. The NSR is now actively used by “Norilsky Nickel,” “Lukoil,” “Gazprom,” “Rosneft,” “Rosshelf,” “Novatek,” and other Russian companies to ship products and supplies to and from their plants, mines, oil, and gas fields.

In the Soviet time, the Northern Sea Route was a purely domestic seaway where international shipping was not allowed. However, with the Arctic ice melting, the NSR becomes more accessible for navigation and Russia expresses its genuine interest in making the NSR an international transport corridor. Moreover, Moscow hopes that revenues from icebreaker and pilot escort will be helpful in maintaining its icebreaker fleet and NSR port infrastructure which are extremely costly.

2.1 The NSR's Competitive Advantages

It is widely acknowledged that an ice-free Arctic could significantly reduce transportation costs by making shorter the way from Europe to China and Japan by 20–40% (see Fig. 3). In principle, for many vessels traveling from East Asian ports (China, Japan, and South Korea) to Western and Northern Europe the way through the NSR is shorter than through the southern routes, including the Suez Canal. For example, the distance from Yokohama to Hamburg via the NSR is only 11,100 km while the route via the Suez Canal is 18,350 km. This could reduce the sailing time from 22 to 15 days (i.e., the 40% reduction). The way from Shanghai to Rotterdam could be shortened from 22,200 km (through the Cape of Good Hope) to 14,000 through the NSR. The growing piracy in the Horn of Africa, the overburdening of the Suez Canal (or its obstruction similar to what happened in March 2021), regular

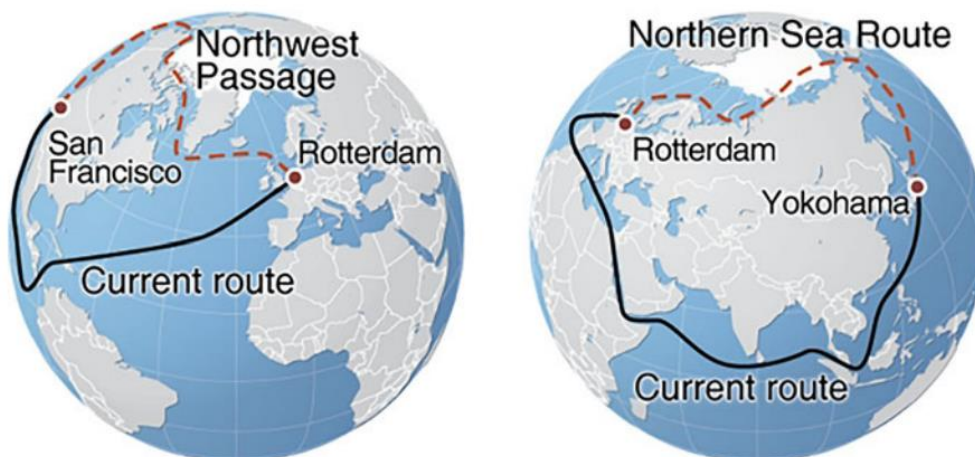


Fig. 3 The Northwest Passage and Northern Sea Route (as compared to the southern routes). Source: <http://maps.grida.no/go/graphic/northern-sea-route-and-the-northwest-passage-compared-with-currently-used-shipping-routes>

tensions in the Hormuz Strait, all shift attention of shipping companies to the search of new alternatives, including the NSR.

Trip from northern Russia to North America (especially to Canada) would also be faster by using the Arctic seaways. Vancouver is 9600 km from Murmansk through the Bering Strait, but is 16,000 km through the Panama Canal. In 2007, Moscow and Ottawa tried to launch a project “Arctic bridge” connecting Murmansk to the port of Churchill located in the Canadian Province of Manitoba. The Canadian railroad operator OmniTRAX (the owner of the Churchill port) even started negotiations with the Murmansk Shipping Company on this issue. In 2007 and 2008, the experimental shipments of Russian cargo arrived in Churchill from Murmansk.

2.2 The NSR’s Weak Points

In contrast with the above optimistic expectations, some international experts (Antrim, 2010; Laruelle 2014; Smith & Giles, 2007) point out that navigating through the NSR is still a serious challenge. Firstly, the significant reduction or full disappearance of polar ice during the summer season does not make the NSR water area completely ice-free. Ice can suddenly emerge on the way of a ship. There could be a plenty of icebergs as a result of glacier melt-down. In other words, the possibility of collision and shipwreck will still be considerable; the trip via the NSR will still be quite risky and unpredictable.

Secondly, navigating polar waters is (and will be) difficult in technical terms: ships need ice-strengthening and—depending on a season—icebreaking capabilities, as well as proper training for captains and crews to sail via the NSR.

Thirdly, international shipping companies complain that Russian fees for ice-breaker and pilot escort and getting weather and ice reports are too high and sometimes unnecessary.

Fourthly, international insurance companies tend to introduce high insurance fees for shipping cargo via the NSR because of its unpredictability in terms of time of shipping, maritime safety, and other risks.

Fifthly, currently, the NSR has no 100% reliable operational rescue system and not all Russian Arctic ports would be able to host vessels in need of repairs. The Russian government builds ten SAR centers along the Russian Arctic coastline but the question whether these plans would come true or not and whether these centers would be helpful in the NSR development remains open to discussion.

Sixthly, the environmental consequences of the NSR’s increased traffic can be controversial because of pollution from ships and the risk of accidents. The 2013 international agreement on prevention and fighting oil spills in the Arctic Ocean signed at the Arctic Council’s ministerial meeting in Kiruna is helpful in coping with this environmental threat but still insufficient to solve the whole problem.

The above concerns, however, do not preclude both Russia and potential NSR users from the ambitious plans to develop this important Arctic route.

3 The NSR Management System

The NSR was officially opened to international use in 1991. The legislative/normative basis for the NSR use included the Regulations for Navigation on the Seaways of the NSR (1991), the Guide for Navigation through the NSR, the Regulations for the Design, Equipment, and Supply of Vessels Navigation in the NSR (1995), the Federal Law on the Northern Sea Route (Putin, 2012), and the Ministry of Transport's Regulations on Navigation through the NSR (2013).

To effectively control Arctic shipping, the Ministry of Transport reestablished its NSR Administration (NSRA) in March 2013. This agency was responsible for processing Russian and foreign ships' applications for the navigation through the NSR and ensuring the navigation safety. Later, along with the Russian Maritime Register (national classification society), the NSRA was charged with implementation of the International Maritime Organization's (IMO) Polar Code (2014–2015) which entered into force in 2017 (NSRA, 2021; Sergunin & Konyshchev, 2019, p. 79).

However, given the growing traffic via the NSR and the need to quickly develop its infrastructure, the Kremlin started to doubt whether the NSRA and Ministry of Transport at large would be able to effectively cope with the existing and future challenges (Humpert, 2018; Sergunin & Konyshchev, 2019, pp. 79–81).

The Kremlin even started to discuss an idea of establishing a “superagency” that could solve all the NSR-related managerial and infrastructural problems by coordinating the icebreaker, rescue and research fleets' activities, maintain the port, navigation, and communication infrastructures, issuing permissions for ships to travel through the NSR, developing international cooperation, and so on (Marinin et al., 2018). However, this idea met a cold shoulder from various executive agencies managing the NSR as well as from private companies which did not want to deal with a new bureaucratic “monster” looking like Joseph Stalin's Glavsevmorput' (the Main Directorate of the Northern Sea Route).

Finally, the Kremlin opted for a compromise variant: President Vladimir Putin approved a new version of the NSR law (27 December 2018) which introduced a NSR management system based on shared responsibility (the so-called two-key principle) of the Russian Nuclear Power Agency (Rosatom) with its fleet of nuclear icebreakers and Ministry of Transport, including the NSRA (Putin, 2018b). Rosatom was charged with the development and operation of the NSR, as well as with maintaining and improving the infrastructure and seaports along Russia's Arctic coast. A special department on the NSR was organized within Rosatom. At the same time, the NSRA, being an integral part of the Ministry of Transport, kept its prerogatives to issue regulations on Arctic shipping, give or refuse permissions to navigate the NSR, and develop international cooperation, including the Polar Code implementation. Obviously, this reorganization aimed to make the NSR management system more efficient and carry out President Putin's ambitious plan to annually ship 80 million tons of cargo through this polar route by the year 2024 (Putin, 2018a).

To illustrate the central role of Rosatom in decision-making on the NSR it should be noted that the 2019 Government's plan to develop the NSR infrastructure up to 2035 was in fact drafted by the Rosatom (Golubkova & Stolyarov, 2019).

Besides the two above agencies (Rosatom and Ministry of Transport), several other governmental bodies are involved in the NSR decision-making. The Federal Service for Hydrometeorology and Environmental Monitoring and its research institutions, including the Arctic and Antarctic Research Institute in St. Petersburg, as well as the State Space Corporation provide governmental bodies and vessels navigating through the NSR with information on ice and weather conditions in the Arctic.

The Ministry for Civil Defense, Emergencies and Elimination of Consequences of Natural Disasters is in charge with SAR and oil spill prevention and response activities in the NSR water area. As mentioned above, this ministry develops a network of SAR centers along Russia's Arctic coastline.

The Ministry of Defense is one of the key players in the NSR decision-making system as well. Civil agencies should coordinate concrete shipping routes with the Defense Ministry to bypass the Arctic islands hosting Russian naval and air force bases (Yeltsin, 1998, Articles 14–15; Pokrovsky, 2019). In addition, the Rosatom and NSRA should take into account military exercises in the NSR water area. The Russian military is supposed to assist the civilian rescue agencies with SAR operations, if necessary.

The Border Guard Service (BGS) and its structural component—Coast Guard—play an important role in organizing border controls, ensuring economic security and preventing illegal activities in Russia's exclusive economic zone (EEZ), including poaching, smuggling, illegal migration, attacks on critical industrial and infrastructural objects and terrorism. According to the NSR navigation rules, ships crossing Russian maritime borders (sometimes repeatedly) should notify the BGS (through the Russian system of ship identification) on the proposed route of navigation and systematically report on their position (Government of the Russian Federation, 2014). This is required for both exercising control over shipping and maritime safety reasons because the Coast Guard vessels potentially can be used in SAR operations.

The Ministry of Interior and the Russian National Guard are responsible for preventing illegal migration along the Russian Arctic coastline and helping the Ministry of Emergencies' SAR operations on the land.

Given the multiplicity of decision-makers (see Fig. 4), there is a problem of coordinating their activities. However, this coordination function is not performed by such governmental bodies as the Ministry for the Development of the Far East and the Arctic and the State Commission on the Arctic Development, because they are engaged in the development of the AZRF as a whole, and not the NSR. The absence of such a coordination mechanism leads to inconsistency in the actions of various departments responsible for the NSR, and, as a result, to a decrease in the effectiveness of the NSR's functioning and the dissatisfaction of its Russian and foreign users. Unfortunately, the creation of an effective decision-making system for the NSR and the management of Arctic shipping remain an unsolved problem.

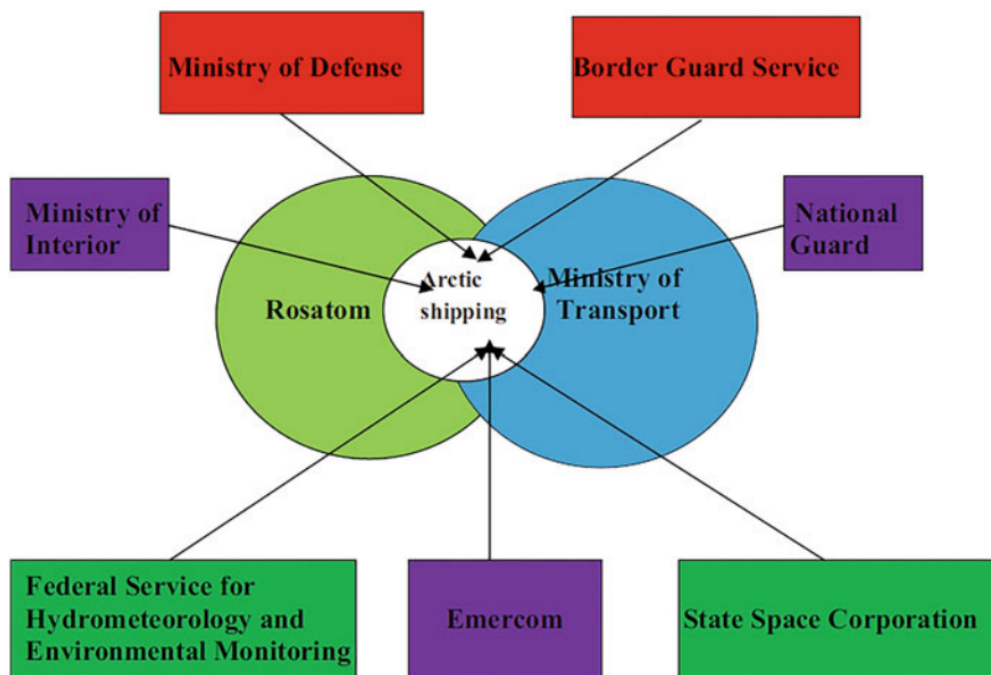


Fig. 4 NSR management system

4 Russia's Policies on the NSR

Moscow faces the following dilemma with regard to the organization of Arctic shipping: On the one hand, Russia wants to make the NSR an international transport corridor and attract foreign customers to actively use this seaway. On the other hand, the Kremlin would like to promote Arctic shipping under Russian flag and restore Russian shipbuilding industries, including shipyards that produce vessels for navigation in ice conditions (Gavrilov, 2020). It is worth of remembering that about 5–7 years ago the Novatek company was unable to find a Russian shipyard capable of building ice-class LNG tankers to ship the Yamal LNG plant's products from Sabetta port to Russian and foreign customers. The Novatek had to order 15 LNG tankers of Arc7 class to the South Korean Daewoo Shipbuilding Marine Engineering (DSME) company. Such Moscow's ambivalent line was reflected in the recent Russian regulations on the NSR navigation.

The first legislative initiatives to limit the use of foreign tonnage on the NSR were undertaken in 2015 when Russia started to feel the effects of Western economic sanctions, including its Arctic sector of economy (Moe, 2020). However, it took another 2 years to materialize them in the form of a new federal legislation.

On 29 December 2017, the new Federal Law No. 460-FZ "On Amending the Merchant Shipping Code (MSC) of the Russian Federation and Invalidating Specific Provisions of Legislative Acts of the Russian Federation" was signed into law by President Vladimir Putin (2017). Its main objective was to create conditions for increasing the participation of vessels sailing under the Russian state flag in shipping

activities between Russian seaports, as well as between Russian ports and any other locations under Russian national jurisdiction (for example, artificial islands, installations and structures within the Russian EEZ or on the Russian continental shelf). That objective has been achieved by expanding the term “cabotage” and by establishing the rule that icebreaking services and pilotage assistance in the NSR water area can only be performed by ships under the Russian flag.

At the same time, the law made it easier to re-register to Russian flag which was important for those Russian ships which used flags of convenience.

The Article 4 of the MSC has also been amended to provide that oil, natural gas (including LNG), and gas condensate extracted on Russia’s territory or its continental shelf and loaded onto ships in the NSR water area can also be transported, until the first point of unloading or in cases of transshipment, solely by vessels flying the Russian flag. The aim of the law was “to create favorable social and economic conditions for cabotage by finding balance between the interests of state, carriers and consumers, as well as to increase the competitiveness of sea carriers engaged in the transportation and towing on vessels flying the State flag of the Russian Federation” (Poyasnitel’naya Zapiska, 2016).

Since some Russian and foreign customers might be discontent with the Russian requirement to pay not only for the goods themselves but also for their shipment by Russian vessels via the NSR, the law admitted some exceptions. For example, paragraph 4 of Article 4 of the MSC provided that Russian Government is entitled to issue special permits for the transportation of the above goods by ships sailing under foreign flags “if it does not contradict generally recognized principles and norms of international law and international treaties of the Russian Federation” (Putin, 2017). The law allowed for an exception to the above restrictions for the vessels of certain countries, depending on the current economic or political situation and on the willingness of these countries to develop friendly bilateral relations with Russia.

The first such permit was issued by the Russian Government decree No. 435-r on 14 March 2019 (Government of the Russian Federation, 2019). Twenty-eight foreign ships have been given the opportunity to transport natural gas and gas condensate from Sabetta up to the first unloading or transshipment point. This decision has been made in the interests of the Novatek company, which used the fleet of tankers built in South Korea and flying both Russian and foreign flags.

As some experts believed, the Novatek experience could encourage other shipping companies to apply for similar exceptions (Gavrilov, 2020, p. 279). On the other hand, the Russian business community tended to believe that the problem of increasing the competitiveness of Russian sea carriers should be resolved by adopting a special law to support Russian shipbuilding and providing large-scale state support to this industry rather than by introducing legislative bans and exceptions therefrom (“Gazprom” poprosil isklyucheniya, 2019).

However, given the fact that increasing capabilities of Russia’s shipbuilding industries to a sufficient level takes some time, Moscow continued to expand the list of exceptions. On 1 March 2020, a Federal Law “On Amendments to Article 4 of the Merchant Shipping Code of the Russian Federation” was adopted which

introduced an additional paragraph 5 to the MSC Article 4 permitting the Russian Government to grant ships under foreign flags the right to engage in cabotage, icebreaker assistance, search and rescue operations, marine resource research, and some other marine activities in the NSR water area (Putin, 2020). Foreign ships can get such a permission in accordance with Russia's international treaties and/or in other cases determined by the Russian Government.

At the same time, the Kremlin did not abandon the idea of transporting hydrocarbons out of the AZRF by vessels built only in Russia. The initiative was launched by the Ministry of Industry and Trade and endorsed by the Energy and Transport Ministries (Moe, 2020, p. 213). The aim of this initiative was to support further development of the Russian shipbuilding industry, particularly its sector responsible for building ice-class vessels, including the new shipyard "Zvezda" (Star) nearby Vladivostok (Solski et al., 2020). In September 2018, vice prime minister Yuri Borisov said in an interview to the Russian TV that the new rules were to take effect on 1 January 2019 (Rossiya vvodit ogranicheniye, 2018). At the same time, Borisov admitted that for some time foreign-built vessels still could operate in the NSR water area because the Russian shipbuilders were unable to satisfy soon the growing needs of Russian hydrocarbon producers in transporting LNG and oil products via the NSR.

The proposal to reserve hydrocarbon shipping only for Russian-built vessels has again provoked an open dispute with Novatek and other Russian energy companies, which argued that the Russian shipyards were unable to produce ice-class vessels by the moment when the Arctic LNG 2 plant and other projects will be operational and, hence, implementation of the law might put further LNG and other hydrocarbon projects in jeopardy.

As mentioned above, in March 2019, the Russian government confirmed and extended the solution for Novatek by permitting the use of the 15 South Korea-built icebreaking Arc7 LNG carriers plus 13 other conventional LNG tankers under foreign flag, all individually listed, until 2043. It was decided that the Arc7 carriers will transport the LNG from the production sites of both Yamal LNG and Arctic LNG 2 plants to reloading terminals to be constructed nearby Murmansk and on Kamchatka. The conventional LNG tankers, which are less expensive to build and operate, will bring the gas further, to the customers both in the West and Asia Pacific.

Moreover, in early 2020, Novatek got permission to order ten Arc7 LNG tankers from abroad, on the argument that Zvezda would not have capacity to deliver vessels in time for all Novatek projects which included not only Yamal LNG, Arctic LNG 2 but also Ob' LNG and Arctic LNG 1 (Vedeneeva, 2020). However, since the introduction of the Ob' LNG plant was postponed, Novatek decided to limit itself to six Arc7 LNG tankers. The Russian shipping company Sovkomflot and Sino-Japanese MOL ordered three carriers each to the DSME to be delivered by the end of 2023 (Dyatel, 2020).

However, the Russian government stood firm regarding the restriction on foreign-built vessels for the next LNG projects. As a result of the government's pressure, at the end of 2018, Novatek had to agree to order 15 Arc 7 icebreaking carriers from Zvezda, for delivery between 2023 and 2025. Later the company also announced it

would order five more carriers from Zvezda for the Ob' LNG project before 2025 and planned ordering additional 15–17 carriers from the yard before 2030, for the projects Arctic LNG-1 and Arctic LNG-3. Thus, total orders at Zvezda will amount to 35–37 Arc7 carriers before 2030 (Moe, 2020, p. 217).

All in all, the above new regulations definitely signify a trend that Russia embarks on increased shipping in the NSR water area of vessels which are built in Russia and sailing under the Russian flag.

The establishment of a new NSR management system and entering into force of the IMO Polar Code necessitated the introduction of a revised Rules of Navigation via the NSR in September 2020 (The Government of the Russian Federation, 2020). The document underlined that in contrast with the Rules-2013 Rosatom is now responsible for the organization of navigation through the NSR. To coordinate this work Rosatom established the Marine Operations Headquarters (MOH) which is responsible for (1) icebreaker assistance and escort of ships on the NSR navigation routes and (2) development of routes for navigation and arranging the icebreaker ships along the NSR water area.

The Rules-2020 retained the permission system for vessels willing to use the NSR. The permissions are issued by the Federal Agency of Maritime and River Transport (part of the Ministry of Transport) or its subordinate organization (NSRA) in agreement with the MOH. In contrast with the Rules-2013, the new rules require from the applicants a copy of the Polar Ship Certificate, envisaged by the Polar Code.

To obtain a permission, an application in electronic form (pdf file) shall be submitted to the NSRA by the shipowner, a representative of the shipowner, or the master of the ship, in Russian and/or English. The application shall contain information about applicant with indication of the full name and identification number of the ship assigned by the IMO, as well as surname, first name, patronymic (if any) of the head of the applicant—legal entity, contact phone and fax numbers, e-mail address (for a legal entity) or surname, first name, patronymic (if any) of the applicant, contact phone and fax numbers, e-mail address (for physical person who applied with a statement on his own behalf).

The following documents should be attached to the application in electronic form (pdf file), in Russian and/or English:

- information on the ship and the voyage;
- a copy of the Classification Certificate, issued by an organization, authorized for classification and survey of ships;
- a copy of the Tonnage Certificate;
- a copy of a Certificate of insurance or other financial security of civil liability for pollution damage from ships, issued in accordance with the International Convention on Civil Liability for Bunker Oil Pollution Damage, 2001, International Convention on Civil Liability for Oil Pollution Damage, 1969;
- a copy of the Certificate issued by an organization, authorized for classification and survey of ships that has approved the Project of a one-time passage (a ferry), confirming the possibility of implementation of a passage with an indication of

the conditions for its completion (for a ship passing outside its designated areas and sailing seasons);

- a copy of the standard towing Manual or towing Project, approved by an organization authorized for the classification and survey of ships (for towed floating objects in their designated navigating area, including towed floating drilling rigs);
- a copy of the Polar Ship Certificate, required by the Polar Code (for ships to which this Code applies);
- a copy of the Certificate of Ownership of the ship (Certificate of Registry) (or other document confirming such ownership);
- a copy of the Contract for Icebreaker Escort Services (for ships for which such escort is mandatory according to the criteria for the admission of ships to the NSR water area, provided for in the Rules' appendix).

This application (with the documents attached) shall be sent by the applicant not earlier than 120 calendar days and not later than 15 working days before the estimated date of the ship's entry to the NSR water area. The NSRA should take decision on the application within ten working days; it takes five working days to get response from the MOH.

The grounds for refusal from the MOH are as follows:

- non-compliance of the ship with the admission criteria;
- non-submission by the applicant of a copy of the Contract for Icebreaker Escort Services, if such assistance is mandatory according to the admission criteria.

The NSRA can refuse to issue a permission if one or more of the following grounds are present:

- the MOH refusal;
- providing of incomplete or unreliable information in the application or its attachments;
- the documents are presented in an unreadable format;
- incomplete set of required documents or invalid documents have been submitted;
- the application is not signed by the applicant;
- ship's planned navigation route or area of work in the NSR water area and/or the period of navigation are outside the areas and/or seasons of operation of the ship, established by the organization authorized for the classification and survey of ships.

Any vessel allowed to travel via the NSR should notify the MOH 48 hours prior to entering the NSR water area. It also should submit to the MOH the following information: (1) the ship's name; (2) Ship Identification Number (if any); (3) the port of departure, actual date and time (Moscow time) of the departure; (4) the port of destination, estimated date and time (Moscow time) of arrival; (5) the maximum draft of the ship (in meters); (6) type and quantity (in metric tons) of the transported cargo (information on the floating object being towed); (7) class and quantity (in metric tons) of the transported dangerous cargo (if any); (8) fuel oil bunker

with indication of the type of fuel oil (in metric tons) and the number of days during which the ship can proceed without bunkering; (9) fresh water supply taking into account fresh water replenishment from the ship's desalination plant (if any) and indicate the number of days during which the ship can proceed without replenishment of the fresh water supply; (10) provisions and other ship's stores and the number of days during which the ship can proceed without replenishment of the provisions and other ship's stores; (11) the number of crew members and passengers on board; (12) information on damage to the ship's hull, malfunctions of ship's engines, machineries, and/or technical facilities (if any); (13) the names, Ship Identification Numbers of towed ships (if any), other floating objects, type and quantity of cargo, number of crew members and passengers on their board (if any); (14) estimated date and time (Moscow time) of the ship's entry to the NSR water area, indicating the geographical coordinates of the planned crossing point of the NSR border.

The captain of a vessel traveling via the NSR should be in touch with the MOH on the daily basis and inform it on ship's standing as well as on arrival in the port of destination within the NSR water area or Russia's internal waters or leaving the NSR water area.

The Rules-2020 explained which vessels traveling through the NSR needed icebreaker and pilot escort and referred to the 2014 regulations on escort tariffs.

The document also reminded to the NSR potential customers about maritime safety rules and measures to prevent pollution from ships in accordance with the IMO Polar Code.

It should be noted that the whole procedure of getting permission for navigation via the NSR and ship's travel through this seaway did not become more complicated. It was slightly changed because of the introduction of the "two-key principle" (NSRA/MOH) and some new documents (e.g., the Polar Ship Certificate) and safety and ecological requirements stipulated by the Polar Code.

5 Russia's NSR Developmental Strategies: Past and Present

In the 2000s, discussions on the draft Concept for the Development of the Northern Sea Route, designed for the period up to 2015, unfolded in Russia. In the draft, it was indicated that the Concept's basic idea was that in the process of integrated development of the NSR and its use on a commercial basis, a self-supporting, cost-effective Arctic Sea Transport System under state control will be created by 2015 (Goldin, 2018). The discussions lasted for several years but did not lead to the adoption of the Concept. No real measures to develop the NSR were taken.

On November 22, 2008, the Russian government approved the Transport Strategy of Russia for the period up to 2030. Among its goals was integration into the world transport space and the realization of the country's transit potential, which fully related to the NSR. It was planned to reconstruct and build terminals that ensure

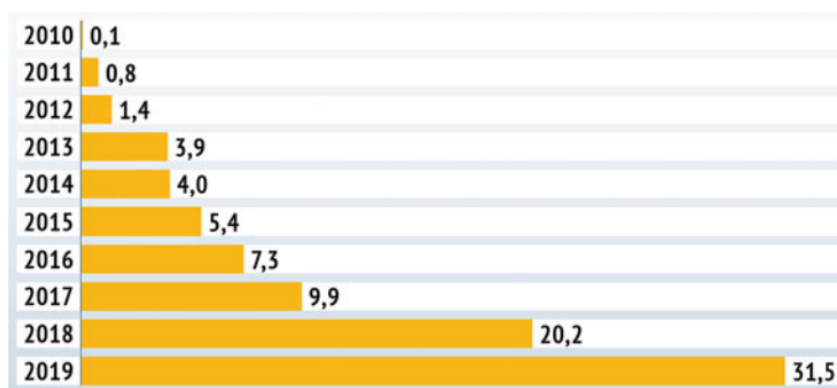


Fig. 5 The NSR cargo traffic (2010–2019), million ton. Source: <https://www.vetandlife.ru/vizh/rynki/infografika-vizh-dinamika-perevozki-gruz/>

the NSR operation, as well as the development of a number of ports (The Government of the Russian Federation, 2008).

The situation started to gradually change in 2011–2012 when the Kremlin decided to support internationalization of the NSR by launching a number of investment projects to modernize the NSR infrastructure. In 2011, the then Prime Minister Vladimir Putin said that 38 billion rubles would be allocated to increase the icebreaker fleet by 2014, and three universal nuclear icebreakers and six diesel-electric ones would be built by 2020. He also recalled the state decision on the creation of 10 integrated emergency rescue centers in the Russian Arctic (Zhernov, 2011). To this end in 2012–2014, over 21 billion rubles were allocated to the construction and modernization of maritime infrastructure in the Arctic (The Government of the Russian Federation, 2012).

The launch of the Novatek’s Yamal LNG plant in late 2017 created a principally new situation in the region by requiring organization of all-year-round LNG shipments to East Asian and European customers. The volume of cargo traffic along the NSR has grown sharply over the past decade from 0.1 million ton in 2010 to 31.5 million ton in 2019 (see Fig. 5). In 2020, the cargo volume reached 32 million ton (Rosatom, 2021, p. 3).

Responding to the growth of the NSR cargo traffic a detailed plan of practical measures to develop the NSR infrastructure up to 2035 was adopted by the Russian Government in December 2019. It provided, inter alia, for renovation of ports along the NSR; building of SAR and auxiliary fleets; expansion of navigational and hydrographic services; development of a satellite group servicing the NSR communications and navigation; building new icebreakers; stimulating cargo shipments and international transit; boosting local energy supply, staff education, encouraging domestic shipbuilding, and assuring environmental safety (Medvedev, 2019).

The plan’s main goal was to create by 2023 all the necessary conditions for ensuring all-year-round transportation of goods and passengers via the NSR. The document consisted of 84 points divided into 11 categories and listed concrete



Fig. 6 High-altitude routes in the NSR water area. Source: <http://www.hydro-state.ru/kage.html>

measures to be implemented by federal authorities, regional governments, and largest state corporations operating in the AZRF (Medvedev, 2019).

According to Alexey Likhachev, the head of Rosatom, this plan requires 735 billion roubles (\$11.7 billion) in investments, with the state budget to provide a third and the rest to come from companies, such as Rosatom itself, Rosneft, Novatek, Gazpromneft, Gazprom, Normickel, and banks (Golubkova & Stolyarov, 2019).

As to the infrastructural aspects of the NSR development the Russian Ministry of Transport plans to develop a high-altitude version of the NSR for large-capacity vessels. The first phase of the project aims to establishing 2-mile wide main and alternative lanes; at the second phase, 20-mile wide routes will be laid out (see Fig. 6). To this end, the MT's Federal State Unitary Hydrographic Department charts the routes with the help of three hydrological ships.

To increase the NSR's safety, Russia should complete the creation of ten federal SAR centers along the NSR. Currently, seven federal SAR centers are already operational in the AZRF (Murmansk Directorate of the Ministry for Emergency Situations, 2021). Moreover, there are four regional SAR and fire units, two maritime SAR coordination centers (Murmansk and Dikson), three maritime SAR stations (Arkhangelsk, Tiksi, and Pevek), and four storages for equipment for oil spill response (Dikson, Tiksi, Pevek, and Providence) (Vasilyev et al., 2015, p. 29) (see Fig. 7).

To further develop the NSR and bring it to international standards, some Russian experts suggest establishing an international consortium with the participation of *Rosatomflot* (nuclear icebreakers), *Sovkomflot* (tanker, gas, and cargo fleet), *Rosmorport* (port and navigation infrastructure), and international shipping companies (tanker and container fleet) (Semenikhin & Novosel'tsev, 2015, p. 9). The Russian government, however, opted for the Rosatom's leadership in managing the NSR.

To increase safety of the maritime traffic via the NSR Russia should further develop SafetyNET and Navtex systems in the NSR area. Particularly, in addition to

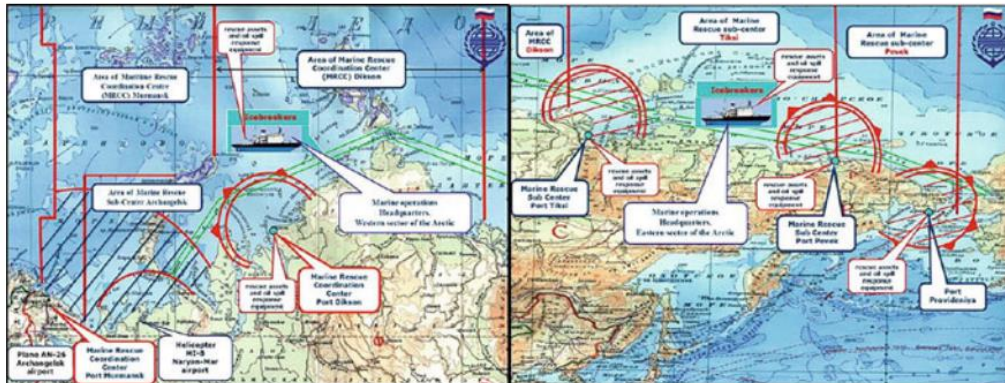


Fig. 7 Search and rescue centers on the Arctic Ocean’s coastline and their zones of responsibility. Source: http://www.arctic-lio.com/nsr_searchandrescue



Fig. 8 SafetyNET and Navtex coverage zones in the NSR water area. Source: <http://www.hydro-state.ru/tsibm.html>

the existing Navtex station in Tiksi, a new Navtex station will be built on the Andrew Island (see Fig. 8).

As for technical aspects of the PC implementation many Russian and Western experts believe that a greater attention should be given to a proper equipping of ice-class ships for navigating in the polar areas. For example, Russia’s Norilsk Nickel company uses Jeppesen’s dKart Ice Navigator on their ice-class vessels, which helps them to significantly save costs for icebreaker assistance. New ice detection options for high-resolution radars in the form of an ice radar overlay on an ECDIS can also contribute to safer and more efficient navigation in ice fields (Oechslein, 2014).

Another concern for many NSR users is ionospheric interference: electromagnetic fields affecting radio signals on particular frequencies. These can affect positioning systems, as well as communications in general. Recent research by the International Association of Lighthouse Authorities (IALA) and the IMO confirmed that modern e-Navigation requires a more resilient positioning system. The Russian Arctic is fully covered by long-range RNS “Chaika”—the Russian version of LoranC—which is considered as a reliable backup to GPS/GLONASS and included in the global radio navigation plan of the IMO (Oechslin, 2014).

It is interesting to note that Russian and foreign experts suggest some specific proposals for bilateral cooperation in the PC’s context. For example, some specialists propose a number of the U.S.-Russian bilateral initiatives:

- Commit resources to improve hydrographic information and update nautical charts.
- Improve navigation safety information sharing between the two countries.
- Improve emergency response capability, such as stationing a rescue tug near areas of high risk or high value.
- Conduct oil spill response exercises to test the effectiveness of the 2013 Arctic Oil Spill Agreement.
- Institute communication and reporting requirements to better monitor vessel traffic, reduce risk, and ensure vessel compliance with appropriate Arctic guidelines for safe navigation.
- Cooperate on establishing voluntary navigation safety measures in the Bering Strait (Rufe & Huntington, 2014).

6 Conclusions

It is clear that the NSR will retain its strategic importance for Moscow although there is a lack of clarity in its legal status, developed infrastructure, and reliable SAR system. Russia views this Arctic seaway as an effective tool to further develop the AZRF and engage the latter in international cooperation. The Kremlin is serious about the NSR development and has ambitious plans to attract both domestic and foreign investments to make this route more efficient and attractive for international customers. However, Moscow still has to cope with the old challenge: how to keep its control over the passage and help its shipbuilding industry with new orders, on the one hand, and make the NSR an international maritime transport corridor, on the other.

To transform the NSR from the domestically-oriented and insufficiently reliable sea route to an attractive platform for international maritime cooperation, Moscow still has to solve current legal, managerial, infrastructural, and environmental problems. First of all, Moscow should establish clear and transparent rules of shipping through the NSR water area. The Russian governmental agencies responsible for managing the NSR should establish a clearer division of labor between themselves

and better coordinate their activities. The Russian authorities should significantly improve the NSR's port, SAR, communication, and other infrastructures. They should also clearly define safer and faster lanes within the NSR water area—depending on ice and weather conditions. Moscow should systematically modernize its icebreaker, rescue and research fleets operating in the Arctic Ocean. Russia should also establish reasonable and transparent icebreaker and pilot escort fees to make them affordable for all NSR potential customers.

If Moscow's ambitious program of the NSR development (launched in 2019) to be executed and legal aspects of Arctic shipping to be clarified, Russia could have a real opportunity to transform this Arctic seaway into a popular transport corridor connecting not only Russian northern ports and regions but also Europe and East Asia. Along with gaining economic benefits, Moscow's could demonstrate to the world community that it is interested in de-securitization of the Arctic region and making it a region of peace and cooperation, as declared in Russia's strategic documents on the High North.

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