The Northern Sea Route: problems and prospects of development of transport route in the Arctic

V P Fedorov¹, V P Zhuravel¹, S N Grinyaev² and D A Medvedev²

¹Institute of Europe of the Russian Academy of Sciences, Moscow, Russian Federation.
²National University of Oil and Gas "Gubkin University", Moscow, Russian Federation.

zhvalery@mail.ru

Abstract The article reveals the peculiarities of the Northern Sea route as a key transport route in the Arctic and assesses the current state and prospects for its development. The authors pays attention to the analysis of restructure and growth of the cargo transportation on the Norhten Sea route, as well as measures for its development and improvement of the organizational structure of management, and navigation safety, and also development of port’s infrastructures in the Arctic zone of the Russian Federation. It is noted that the state corporation Rosatom in late 2018 adopted the functionals of the single infrastructure operator of the Northern Sea route. Measures taken by the government of the Russian Federation to further develop a modern icebreaker fleet are revealed. It is noted that the new approach to the functioning of the Northern Sea route consists in a significant increase in its cargo transportation with the parallel development of Russian Arctic territories within the framework of the pivotal development zones. The authors conclude that the present development of the Northen Sea route is more directed for solving social and economic problems in the Russian Arctic. The article also outlines the perspective international aspects of the development of the Northern Sea route, which are already being implemented.

1. Introduction
The Northern Sea route (NSR) and the Arctic development has recently attracted an increasing attention in Russia and all around the world. Many leading experts believe that this shortest transport artery linking Europe and the dynamically developing Asia-Pacific region is the world’s future of maritime logistics and trade [1, 2, 3, 4]. At the same time, there were fears that a number of geopolitical factors and natural restrictions can reduce the competitiveness of the Northern sea route compared to traditional routes [5, 6].

2. The Northern Sea route as the national transport artery of Russia
The Northern Sea route is the only navigable route connecting all Arctic and subarctic regions of the Russian Federation. Traditionally, this route is associated with industrial key clusters of the country: The Norilsk Combine; the East Siberian Oil and Gas complex; the enterprises of Yakutia, Magadan, Chukotka (producing gold, non-ferrous and rare metals); timber exporting enterprises of the Arkhangelsk region. Development of the energy resources of the Timano-Pechora province, the Gulf of Ob, Yamal and The Gyda Peninsula, the Barents and Kara seas shelf depend directly on its development.
In accordance with the Code of Commercial Navigation of the Russian Federation, the Northern Sea route is a water space adjacent to the northern coast of the Russian Federation, covering inland sea waters, territorial sea, adjacent and exclusive economic zones of the Russian Federation, bounded from the east by the line of delimitation of maritime spaces with the United States of America, from the west, the meridian of the Cape Of Desire, the eastern coastline of the Novaya Zemlya archipelago and the western borders of the Straits Matochkin Strait, the Kara Gates, the Yugorsk Strait [7].

The legal norm defining the Northern Sea route as "historically developed national transport communication of the Russian Federation", navigation in the water area is carried out in accordance with the generally recognized norms of international law, international treaties of Russia and its national legislation (Federal Law on the NSR, dated July 28th 2012, No. 132, established grounds for further specific regulatory acts to have effect on commercial navigation on the waters of the route). Russian legislation is based on the normative of the 1982 United Nations Convention on the Law of the Sea, Article 234, which establishes that special rights are granted to the polar states in the management of various types of navigation, including navigation, within their economic zone in areas covered with ice for a large part of the year.

In order to ensure the safety of navigation, as well as to prevent, reduce and control pollution of the marine environment from ships, the Federal Law determines the content of the rules of navigation in the waters of the Northern Sea route. In addition, the Federal Law establishes the fee for the icebreaker ship passage, the ice pilot ship passage in the waters of the Northern Sea route, the size of which is determined in accordance with the legislation of the Russian Federation on natural monopolies based on the volume of actually rendered services. On the basis of the adopted legislative norms, a unified management system in the waters of the Northern Sea route and a modern infrastructure was formed, providing safe conditions for navigation in the Arctic seas, including hydrographic and hydrometeorological support, as well as icebreaker and ice pilot escort, permanent control over the location of ships.

On June 5, 2015, the Government of the Russian Federation approved a comprehensive project for the development of the Northern Sea route until 2030. In 2017 the International Maritime Organization's International Code for ships operating in Polar Waters (Polar Code) define the requirements to ships, staying in the waters of the Northern sea route.

The taken measures contributed to a significant increase in the quantity of cargo transportation on the Northern Sea route. So, in 2017 about 10.7 million tons were transported, and in 2018 about 19.7 million tons.

Important decisions on development of the Northern Sea Route were made in 2018-2019 years. In Decree No. 204 of May 7, 2018, the President of the Russian Federation set the task of bringing the annual cargo turnover for the Northern Sea route to 80 million tons. The solution of this ambitious task presupposes carrying out a large set of measures not only for the development of the Northern Sea route, but also for the acceleration of socio-economic development of the Arctic zone of the Russian Federation, which depends in large part on the successful implementation of investment projects for the extraction of mineral resources of large corporations in the Arctic region. In December 2018, The Government of the Russian Federation identified measures to implement investment projects in the Arctic zone of the Russian Federation that ensure the development of the Northern Sea route in accordance with the tasks set out in this Decree.

In pursuance of the Federal Law of 27.12.2018 No. 525-FZ "On amending certain legislative acts of the Russian Federation", the state corporation "Rosatom" adopted the functional of the single infrastructure operator of the Northern Sea route. At the meeting of the State Commission for Arctic Development in the autumn of 2019, the state corporation presented a draft plan for the development of the infrastructure of the Northern Sea route until 2035.

For the first five years this project is aimed at fulfilling the May Decree of the President of the Russian Federation on increasing cargo turnover, carrying out a large-scale work on the development of port and coastal infrastructures, the development of ports of Sabetta, Varandey, Dixon, Tiksi and a number of coastal territories, as well as solving the task of state support for the construction of
icebreakers ships, rescue and auxiliary fleets. During the second stage in 2025-2030 it is planned to provide year-round navigation throughout the Northern Sea route water area, as well as to implement plans for combining the Arctic sea routes with the cargo flow under the new transport infrastructure project Northern latitudinal passage, which is currently under development. At that time a radical update of the entire grouping of the nuclear icebreaker fleet is also planned. The third stage of development in 2031-2035 is planned to make the Northern Sea route a basic element of a competitive international and national sea transport corridor. During the discussion, comments and suggestions were made on the finalization of the plan.

During the same period, measures were taken at the level of federal authorities to further improve navigation and hydrographic support and safety of navigation on the Northern Sea routes, to develop and implement meteorological, hydro and ice services, promising directions of radio communications, unmanned controlled aircraft for rescue, monitoring and ice reconnaissance. In order to fulfill the international obligations of the Russian Federation within the framework of the International Convention on Search and Rescue at Sea of 1979, work continued in the area of the Northern Sea route to form a single global maritime communication system in case of disaster on the Northern Sea route, modernization of a number of facilities of the Maritime Rescue Service of the Ministry of Transport of Russia. Also sea rescue centers were formed in Murmansk and Petropavlovsk-on-Kamchatka.

All this indicates that the Russian Federation is fully aware of its special responsibility as a coastal state for the management of various types of marine uses, including navigation, coastal and economic zones, as well as the continental shelf in the Arctic, in accordance with the provisions of the United Nations Convention on the Law of the Sea. This responsibility is supported by concrete steps to develop transport, hydrographic, navigation, rescue infrastructure and ensure the safety of navigation along the Northern Sea route.

Of course, not all countries agree with this position. In particular, the US argues with Russia and Canada, and declares that the Northern Sea route, as well as the North-West passage, are international transport routes are affected by the principles of freedom of navigation. It is worth remembering that such operations are being resorted to by the US in the South China Sea to limit China’s activity in “privatizing” an important maritime route.

The renewal and development of the icebreaker fleet is of great importance for the prospects of the Northern Sea route. Long and severe winters are the main obstacle for the passage of ships on significant segments of the road. The most difficult conditions of navigation are found in the Taimyr and Iona ice massifs, which significantly reduce the period of navigation eastward from the Gulf of Ob and Dixon.

In order to ensure the competitiveness of the Northern Sea route as a transport corridor from Europe to Asia, year-round navigation along this route should be ensured. For this purpose, Russia needs to build up the icebreaker fleet, primarily due to the new generation of nuclear ships - an extremely expensive task. Today, the total cost of these three ships is more than 121 billion rubles (based on the course of 2018). On the far Eastern Shipbuilding complex "Zvezda" in accordance with the instructions of the President and Government of the Russian Federation, preparatory work has been started on the implementation of the project to create the head and two serial nuclear icebreakers of the project 10510 LK-120 "Leader". It should provide year-round passage of ships via the Northern Sea route at a speed of at least 12 knots per hour with an ice thickness up to two meters and a maximum ice thickness of over 4 m (at a speed of 1-2 knots) [8]. The speed of travel, which provides a calculated schedule of traffic and, consequently, the competitiveness of traffic, was the main criterion in the choice of project parameters.

The first vessel was built in the Russian Federation in the first year of operation. In addition, PJSC NOVATEK is negotiating with domestic shipbuilders about the construction of four icebreakers on liquefied natural gas to provide navigation on the western part of the Northern Sea route.

The perspectives of the Northern Sea route are inextricably linked with the development of the Arctic zone of the Russian Federation, which was established in accordance with the decisions of the
Security Council in September 2008. In order to improve the efficiency of the management of the Arctic zone of the Russian Federation by President V.V. Putin signed a Decree on the transfer of the Ministry of Far East of Russia authority to develop and implement state policy and regulatory and legal regulation in the field of socio-economic development of the Arctic, and renamed it to the Ministry of the Far East and the Arctic development of the Russian Federation.

It is important to note that the State Commission on Arctic Development considers issues of development of the Northern Sea route and the Arctic Zone of the Russian Federation in close interaction, especially actively applying new instruments and, first of all, creating pivotal zones of development. The arrangement of Arctic territories is largely determined by the improvement of existing and the constructing new seaports and terminals. Development of the infrastructure of the Northern Sea route is possible only with the participation of the state. The driver of development at the same time can be oil and gas projects in the coastal zone and on the shelf of the Arctic seas. The task today is to define the reference points for their inclusion in the Northern Sea route infrastructure development plan and the state program for the development of the Russian Arctic zones on the basis of private-state partnership.

3. International dimension of the Northern Sea route development

The Northern Sea route is the shortest sea route between the ports of Europe and Asia. For example, if the Northern Sea route is compared to the Southern Sea route through the Suez Canal, it should be noted that the distance from the port of Rotterdam (Norway) to the port of Yokohama (Japan) along the Southern Sea route is 11,205 nautical miles, and when using this route it makes it 7,745 nautical miles. Also, when used, the way from Rotterdam to Shanghai port is noticeably reduced - by 2,449 nautical miles, and to the port of Vancouver - by 1932 nautical miles. On average, 25 days and 625 tons of fuel oil are required for the transition from Europe to China while using the Southern Sea route, and 35 days and 875 tons of fuel oil are used on the Suez Canal. This is an obvious advantage. It should be noted that icebreaker for the Northern Sea route is required in the calendar year up to 8 months (November-June). The Northern Sea Route has so far been modestly presented on the map of international shipping. Thus, in 2014, 5,660 million tons of cargo were transported through the Malacca Strait, 882 million tons through the Suez Canal, 222 million tons through the Panama Canal (alternative for the 2018).

At present, as Y.F. Lukin notes, Northern Sea route can’t compete with these channels in the sense of the volume of transported cargo, but it can occupy its niche in the international transit of cargo. Naturally, the importance of the Northern Sea route for inland transportation, northern import, already operating routes through the ports of Arkhangelsk, Murmansk, etc. in addition, they have opportunities for growth tourist cruises in the seas of the Arctic Ocean along the route of the Northern Sea route to the North Pole, to the Arctic islands, to the Nenets Autonomous District, Yamalo-Nenets Autonomous District, Republic of Sakha (Yakutia), Taimyr, Chukotka, in existing natural reserves [9].

In our opinion, this statement of the issue limits the prospects of the development of the Northern Sea route and raises serious objections. First of all, it should be kept in mind that the Northern Sea route in its considerable part is located within the exclusive economic zone of Russia, its territorial sea or even in Russian inland waters, that are under the sovereignty or jurisdiction of our country. As is known, in August 2015, Russia sent a second application to the UN Commission on the Continental Shelf for the expansion of the continental shelf in the Arctic Ocean by 1.2 million square kilometers to join the Lomonosov Ridge and other sections of the seabed, including the Mendeleev, the Podvodnikov basin, The southern tip of the Gakkel ridge and the North Pole zone. All this will contribute to gradual development of the cargo base of transportation.

In September 2019, at the site of the Eastern Economic Forum, the head of the Ministry of Natural Resources D. Kobylkin reported that the agency completed additional scientific research necessary to substantiate the above-mentioned application. This could allow potential hydrocarbon reserves to grow by at least 5 billion tons of conventional fuel.
Accordingly, this will provide additional grounds for maintaining control over high-latitude routes of the Northern Sea route, where the ice and navigation situation in the foreseeable future will remain difficult in any case.

At present, industrial giants such as NOVATEK PJSC, MMC Norilsk Nickel PJSC, Gazprom Neft, etc. In particular, NOVATEK, together with the French company Total, Chinese CNPC and the Silk Road Fund, is implementing a large international project, Yamal LNG, one of the largest investments project in Russia. The project cost is $27 billion THE Credit organizations from Russia, China, Japan, and European countries – Italy, France, Sweden, Austria, and Germany – have joined the project financing. $19 billion was raised, the production of LNG will be 16.5 million tons per year \[10\]. The Yamal LNG project is the most vivid example of the development of international cooperation in the field of sea cargo transportation in the Arctic region, which has no analogues in world practice.

LNG shipments are primarily sent to Asia Pacific countries. The project will be implemented by the Russian companies, which will lead to creation of 12 thousand jobs in Murmansk region, and throughout Russia - more than 80 thousand. According to the report of L.Michelson, Head of PJSC "NOVATEK", to the President of the Russian Federation V.V. Putin by 2024 NOVATEK will transport 46 million tons of cargo via the Northern Sea Route, which will make more than 50% of the total cargo flow.

In the loading of the Northern Sea route, other major Russian companies are increasing volumes. If international cooperation in transportation of ores and coal is a matter of the future, then the transportation of hydrocarbons has been created and there is a closer and certain interaction for that.

The problems in the development of the Northern Sea Route are the corresponding federal and regional structures of the Russian executive power, business representatives, as the analysis shows, try to reduce by means of error-free routing of special vessels of high ice class, professional level of action of crews in arctic conditions; measures were taken to improve customs and border control, improve quality of service; to create modern communication channels for constant tracking of cargo traffic, as well as work on further modernization of infrastructure of existing seaports and construction of new terminals. Digital navigation, operational hydrometeorology and environmental monitoring, unmanned aircraft for ice reconnaissance constitute the infrastructure of Arctic shipping.

In the context of economic sanctions, Russia needs to increase its consistent and long-term cooperation with a number of Asian states. China, as well as Japan, the Republic of Korea, Singapore, and other Asian countries. China is building icebreakers and various types of ice-class vessels. Japanese company 'Mitsui O.S.K. Lines and China COSCO Shipping are involved in the development and operation of the port of Sabetta, the Korean company Hyundai Merchant Marine Co, together with the Chinese "Poly Group", are considering participating in the project for the reconstruction of the Arkhangelsk deep-sea port and the development of the Murmansk transport system. Korean shipping company Hyundai Merchant plans to test transit transportation of container vessels with a capacity of 2500-3500 TEU (unit equivalent to twenty feet) along the Northern Sea route in 2020 \[11\]. There are many examples. It is important to note that all these countries are participating pretty much actively in the work of the Arctic Council.

The growth of Russian cargo transportation at the Northern Sea route, their transfer to year-round rhythmic navigation will ensure a reduction in the cost of transportation and all transport factors (insurance rates, tariffs for icebreaker passage, etc.). This will be the main motivation for attracting foreign carriers to the Northern Sea route and its use as a transit route, especially within the framework of the Chinese initiative "One belt, one road" in particular in the form of "Polar Silk Road" \[12\]. Its joint construction in the Arctic could be a part of a program for the mutual docking of Russia and China in accordance with the development interests of both countries \[13, 14\]. This is a very promising direction of the Northern Sea route development, since it is today the most effective instrument for ensuring international energy security and realizing the competitive advantages of Russia.

In the summer of 2019, ice-class tankers "Vladimir Rusanov" and "Eduard Toll" within the borders of a long-term contract delivered to China the first batch of LNG, after passing through the route of
the Northern Sea route without ice posting for 9 days. A large transport company of China, COSCO Shipping, announced its readiness to carry out 14 commercial container transportations on the Northern Sea route with container ships with a deadweight of 28-34 thousand tons.

In order to integrate the Northern Sea Route into the world transit system as an effective Euro-Asian transport corridor while preserving its sovereignty in the Arctic, Russia needs to improve its infrastructure, create conditions for the development of container transport, attract the largest international shipowners and cargo owners for cargo transportation, improve security, To form economically justified tariffs, to reach with partners solidarity in saving ecological integrity of the Arctic zone, and also to increase the financing of Arctic projects, including through public-private partnership.

4. Conclusion

All major energy projects in the Arctic are carried out with the participation of foreign companies. The development of the Northern Sea route is a long-term development strategy of the Russian Federation. It plays an important role in ensuring the economic, energy, economic security of the Russian Federation in the Arctic region. Its role and importance as a national basic transport artery, capable of significantly increasing the transit potential and competitive advantages of Russia, is constantly increasing.

Development of the Northern Sea route is a necessary condition for ensuring geopolitical and military security of the Russian Federation, reliable transport links and increasing cargo flow as well as normal conditions of life in the Northern territories, accelerated development of mineral deposits, export of oil and gas.

At present, the operation of the Northern Sea route is aimed at the development of the Arctic regions of Russia, mining, processing of minerals and their export. Construction of the Polar Silk Road, active involvement in the Arctic issues of the Eurasian Economic Union in the future will contribute to the construction of a powerful transport infrastructure on land and sea between Asia and Europe. Its implementation along the northern shores of Russia will promote its national interests. The complex development of the Northern Sea route assumes that it will form the basis of the Arctic transport system, which should include a complex of vessels of the sea and river fleet, aviation, pipeline, rail and road transport, as well as coastal infrastructure.

References

[1] Lukin Y F 2015 Northern Sea Route: Opportunities and threats The Bulletin of the MSTU 18(3) 467-475
[2] Dmitrieva S I and Polyansky M A 2017 The Arctic region in the context of Russian foreign policy interests Journal of Russian Law 3 148-157
[3] Suni Xuwen 2017 Potential of international cooperation of the Russian Federation and China in the Arctic: Comparative analysis of national interests Socio-Economic political science 3 12-17
[4] Todorov A A 2017 International transit potential of the Northern sea route: economic and legal aspects Problems of national strategy 3 149-171
[5] Gutman S S et al 2019 Development of the Northern Sea Route as part of the system of international transport corridors North and market: Shaping economic order 1 50-58
[6] Larchenko L V et al 2018 Can the Northern Sea Route become competitive international transit route? Innovatsii 10 64-67
[7] Travkina E V, Ilyasov R M, Samylovskaya E A and Kudryavtseva R E A 2019 Northern Sea Route: Formation of Russian Transport Policy in the Arctic IOP Conference Series: Earth and Environmental Science 302(1) 012088
[8] Vorobiev V M 2017 The creation of the icebreaker-leader is a major stage in the commercial development of the Arctic regions Arctic statements 1 160-163
[9] Lukin Y F 2019 The Arctic is a great place to live in time and senses (Arkhangelsk) 241
[10] Zhuravel V P 2018 Yamal LNG Project is an example of effective international cooperation in the development and development of the Arctic Scientific and analytical bulletin of the Institute of Europe of the Russian Academy of Sciences 3 95-100

[11] Voronenko A L and Grezik S V 2019 Prospects of cooperation between Russia and the North-East Asian countries in the Arctic region Arctic and North 35 60-78

[12] Grinyaev S N and Medvedev D A 2018 Economic determinants of China's Arctic policy Information wars 3(47) 31-33

[13] Zagorskiy A V 2019 China is in the Arctic International relations 7 76-83

[14] Larchenko L V et al 2018 Can the Northern Sea Route become a competitive international transit route Innovation 10 64-67