Development of the Northern Sea Route based on ESG principles

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Abstract. The Northern Sea Route is the most important maritime logistics project. In the future, it should perform various, albeit interconnected, functions: transport support for extraction mineral resources in the Russian Arctic fields, transit communication between the ports of Europe and Asia, as well as the supply of cities and towns in the Arctic zone. At the same time, the future functioning of the Northern Sea Route should be based on the principles of ESG, aimed at minimizing environmental damage and rational use of labor resources. The purpose of the study is to determine the prospects for the development of the Northern Sea Route based on the ESG concept and propose measures to improve the efficiency of its operation. These measures include the development of a GIS system for monitoring the state of the environment in the area of the Northern Sea Route, and in the future, the transfer of all vessels to the use of natural gas motor fuel; development of a unified information system for managing northern delivery, which ensures the optimization of cargo flows; creation at the federal level of a forecasting system and monitoring of cargo transportation along the Northern Sea Route with a simultaneous strengthening of the responsibility of companies holding licenses for the extraction of minerals for the implementation of investment projects on time.

1 Introduction

Commercial use of the Northern Sea Route began actively carried out in the 70s-80s of the XX century. This was caused by two factors. First, it was caused by economic considerations due to the development of economic activity in the Arctic zone of the Russian Federation, the development of natural resources. Secondly, the deterioration of the geopolitical confrontation between the Soviet Union and the United States required the use of new routes for the transportation of goods.

In the 1990s, the scope of cargo transportation along the Northern Sea Route decreased significantly (from 4.8 million tons in 1991 to 1.9 million tons in 2001). However, later, thanks to state support measures and the interest of private companies in the implementation of economic projects, the trend changed [1]. As a result, the cargo turnover of the Northern Sea Route has grown to 33 million tons by 2020. The growth trend in cargo turnover has continued in the first half of 2021. During this period, it increased by 3%.

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The growth of cargo turnover along the Northern Sea Route contributed to the increased interest of researchers to the problems of its functioning and development in modern conditions. (We do not consider earlier studies, since they reflect a fundamentally different economic situation).

At the first stage of studying the activities of the Northern Sea Route (2014-2017), the interest of researchers was focused on determining the general conditions for its operation. Among the complex works it is necessary to indicate the following [2]. This period also includes the following one [3].

At the second stage (after 2018), the researchers focused on the study of separate problems of the Northern Sea Route. In particular, much attention is paid to the problem of optimizing trade routes, both in general [4, 5], and for certain types of raw materials [6]. The interest of foreign authors in the problem of international transit of goods along the Northern Sea Route is significant [7]. The authors of the following studies [8,9] are generally optimistic about the transit possibilities of the Northern Sea Route. Whereas in the study [10], which summarizes the results of ten years of economic activity, an important conclusion is made that the transit itself turned out to be below expectations, and the possibilities for its development are severely limited. A number of authors believe that transit cargo transportations along the Northern Sea Route are impossible without the introduction of innovations [11].

A significant number of works are devoted to the technical aspects of improving the safety of navigation in high latitudes, in particular when moving along the Northern Sea Route. Thus, the study [12] considers the use of geographic information (GIS) systems in the Arctic seas on the example of situational planning of the route of a vessel sailing along the Northern Sea Route. This study [13] considers the process modeling of ice compression of a ship, which is extremely important for the prevention of marine disasters in difficult ice conditions. The study is devoted to the possibilities of using vessels without an ice class on the Northern Sea Route [14].

The conditions for the safety of maritime navigation in Arctic waters are discussed in detail in the article [15]. It sets out in detail the requirements for vessels of various types on the routes of the Northern Sea Route. An important conclusion of the study is the thesis that environmental protection is a complex task, the solution of which is carried out at many levels from the adoption and observance of international conventions to the actions of individual crew members.

Some studies are devoted to particular problems of finding the best logistics routes in the Northern Sea Route zone. Among them, we will name the study [16] which considers the problem of optimizing oil transportation in the Pechora Sea and the Gulf of Ob.

The environmental problems of navigation are considered in the study [17], which substantiates the thesis about the need to create an integrated system of environmental monitoring. Although, generally speaking, environmental problems have not been sufficiently studied in the scientific literature in the process of economic development of the Northern Sea Route.

The active economic development of the Northern Sea Route, the growth in the volume of cargo transportation makes the problem of sustainable development of this transport artery relevant. According to GOST R 54598.1-2015, sustainable development is understood as a long-term balanced approach to social progress, economic activity and environmental responsibility. This definition seems to be quite adequate for the purposes of this study. It reflects the main essential feature of sustainable development - the combination of economic progress with the preservation of the environment.

A large number of studies are devoted to the application of ESG principles in the activities of enterprises, in the process of improving the efficiency of corporate governance [18,19]. Of greatest interest among these studies is the following research work [8]. It

summarizes the main theoretical provisions of the ESG theory and shows promising capabilities of this theory application.

This concept, which, in fact, does not contradict GOST, is more universal, which makes it possible to use it in the analysis of the results of the functioning of more complex socio-economic systems, including the Northern Sea Route. So far, it has not been used for this purpose.

The purpose of the work is to determine the prospects for the development of the Northern Sea Route based on the ESG concept and propose measures to improve the efficiency of its operation.

2 Materials and methods

2.1 Research Methodology

The study is based on the use of ESG principles. This abbreviation stands for "ecology, social policy and corporate governance". In a broad interpretation, ESG is the sustainable development of business activities based on a responsible attitude to the environment (E - environment); high social responsibility (S - social); and high quality corporate governance (G - governance). The essential content of this approach is that the quality of corporate governance should ensure the high efficiency of any socio-economic system in harmony with the environment and taking into account the interests of employees, consumers and society as a whole.

2.2 Theoretical fundamentals

Theoretically, the foundation of the study is represented by the general scientific research methods. The principal one among them is a systematic approach that reflects the relationship and interdependence of decisions made by government agencies and private enterprises in the process of carrying out economic activities in the area of the Northern Sea Route. The article uses the method of logical modeling, which makes it possible to assess the dynamics of the development of the Northern Sea Route with a purposeful change in state policy and measures of state support for transport carriers.

Institutional theory also acts as a theoretical foundation for the study. Its main provision is that in order to rationalize the functioning of the management object, it is necessary to have effective institutions that meet the needs of the national economy.

3 Results

The Northern Sea Route performs three interrelated economic functions. Firstly, the delivery of goods for settlements located in the coastal part of the Arctic zone of Russia. Thus, the Northern Sea Route in itself provides a solution to an important social problem.

The second function is the delivery of cargos from mineral deposits. For the year-round use of polar fields and the delivery of cargos along the Northern Sea Route, vessels of high ice class are needed, capable of independent navigation in this region in the spring and autumn.

Thirdly, it is the transit transportation of goods. Transit can be carried out both between the western and eastern regions of the Russian Federation, and between foreign states. The development of transit is hampered by difficult meteorological conditions in the area of the Northern Sea Route, the need to use specialized ships, and the lack of intermediate ports of unloading.

It is necessary to have rational institutions that ensure the solution of these tasks, environmental and social problems in the process of functioning of a modern management system for the effective development of the Northern Sea Route on the principles of ESG.

Considering such a component as the environment (E), it should be noted that the Arctic nature is very vulnerable to man-made pollution and disasters, which requires a special approach to the implementation of economic activities in this region [17]. However, such an approach should not mean refusing to use the logistical advantages of the Northern Sea Route in the process of cargo transportation, including the transit component.

The negative technology-related impact on the environment comes down to two aspects. First, catastrophic man-made impacts associated with accidents on vessels. Secondly, the constant negative impact on the environment, in particular, emissions of greenhouse gases, shipborne waste from vessels, and the destruction of traditional landscapes, endemic plant and animal species using the Northern Sea Route.

Therefore, in accordance with principle E, it is necessary to create two subsystems: a disaster prevention subsystem and a subsystem for monitoring the state of the environment and reducing anthropogenic impacts on the nature of the Arctic in the Northern Sea Route zone.

To solve the first problem, the federal authorities have taken a number of measures. In particular, the use of vessels of various ice classes when moving along the Northern Sea Route is clearly regulated. The technical condition of vessels is monitored. At the same time, the development of environmental legislation requires the strengthening of state regulation measures while maintaining the transition period.

One of such measures could be the transfer of all vessels in the area of the Northern Sea Route to the use of natural gas motor fuel. The use of natural gas as a fuel completely eliminates the possibility of oil and oil products spills, significantly reducing the risk of environmental damage. Obviously, this measure can be implemented only in the long term (at least 20-25 years). At the same time, in the medium term, it is possible to use measures of state incentives for ship-owners to use vessels on natural gas motor fuel. In particular, due to the differentiation of the cost of icebreaker assistance for ships using different types of fuel.

In addition, it is necessary to create a unified GIS system for monitoring ice conditions and weather conditions in the area of the Northern Sea Route throughout its entire length with online access to it for all interested parties.

Existing institutions should ensure the creation of favorable conditions for the life of people in the process of using the economic potential of the Northern Sea Route in the social sphere (S). The Northern Sea Route is the only supply route for many territories in the Arctic. Therefore, it is necessary to improve the efficiency of the supply mechanism based on the use of modern information technologies.

A promising trend for solving social problems in the Northern Sea Route zone is the introduction of automation systems that allow the use of human labor on a smaller scale in difficult weather conditions. Equally important is the strengthening of employers' liability for violations of labor laws.

The most important step in improving the efficiency of the management system (G) for the transportation of goods along the Northern Sea Route was the creation of the federal state budgetary institution "Administration of the Northern Sea Route" in 2013. The Administration gives permissions for ships' navigation in the Northern Sea Route zone, monitors hydro meteorological and ice conditions. However, the important problem of forecasting the volume of cargo transportation along this transport corridor, based on taking into account the interests of the state and private companies; but the formation of an effective mechanism for public-private partnership remains unresolved.

The construction of a modern icebreaking fleet is one of the most important state tasks for the development of the Northern Sea Route, since the use of its water area without icebreaking assistance for most types of vessels is impossible from November to May. In the eastern sector of the Northern Sea Route from Dudinka to Chukotka, navigation in winter is currently impossible at all, since the thickness of the ice in this region does not allow vessels to be escorted even with the use of modern nuclear-powered icebreakers. It is necessary to use budgetary funds for the construction of icebreakers; the amount of these funds is limited by other social and economic projects of the state [20].

According to paragraph 15 of the Decree of the President of the Russian Federation dated May 7, 2018 No. 204 "On the national goals and strategic objectives of the development of the Russian Federation for the period up to 2024", by 2024 the transportation of goods along the Northern Sea Route should amount to 80 million tons [21]. However, it is clear that by 2024 the indicated scope of traffic will not be reached.

To achieve this goal, the Northern Sea Route Infrastructure Development Plan for the period up to 2035 has been developed [22]. It envisages, in particular, the construction of five nuclear icebreakers of the LK-60Ya (Arctic) project and two icebreakers of the new LK-110Ya (Leader) project. According to our estimates, in 2020 prices, the cost of one icebreaker of the Arctic project exceeds 50 billion rubles, while the icebreaker of the Leader type is 128 billion rubles. The technical characteristics of an icebreaker of the Leader type are redundant for the transportation of goods in the Western sector of the Northern Sea Route (from Murmansk to Dudinka). And for the transportation of goods in the Eastern Sector, there is no necessary freight traffic. Consequently, the question arises about the effectiveness of the use of budgetary funds allocated for the development and construction of new nuclear icebreakers.

4 Discussion

Prospects for the development of the Northern Sea Route will largely be determined by natural factors. Full-scale use of this route for transit transportation of goods will become possible only in the event of ice melting in the southern part of the Arctic Ocean as a result of global warming. Thus, the process of global warming, which is negative for most regions of the planet, has its positive consequences for the development of economic activity in the zone of the Northern Sea Route.

International container operators are currently quite skeptical about the possibility of using the Northern Sea Route. So, in 2019, the French sea container operator CMA CGM announced that it was refusing to use the Northern Sea Route for environmental reasons. Risks associated with disasters, oil spills or collisions with marine life were cited as the reason for this decision. You might think that the company has proven itself to be a responsible organization guided by the principles of ESG.

However, this conclusion seems to be unilateral. The risks of encountering marine life while traveling along the Northern Sea Route are not much higher than in other regions of the world. Maritime disasters, as a rule, have a human factor as their root cause. Minimizing the risks of disasters is one of the most important tasks for any company, regardless of the route of the vessels. Finally, the risks of spilling oil products in the area of the Northern Sea Route do exist, as well as in other regions of the world where diesel fuel vessels are used.

Therefore, there is reason to believe that the topic of environmental protection in the region of the Northern Sea Route is used as a tool to defend their political interests by those countries that are not interested in improving the standard of living of Russian citizens.

A promising trend for solving environmental problems in the area of the Northern Sea Route is the use of hydrogen-fueled vessels. At the same time, the use of hydrogen as a

marine fuel for commercial purposes will become possible only if the existing technologies are significantly improved. Considering that the service life of vessels can reach 50 years, we can conclude that the widespread transfer of vessels to hydrogen is possible no earlier than the beginning of the 22nd century.

5 Conclusions

The use of ESG principles in the process of the prospective development of the Northern Sea Route requires the creation and rationalization of a number of institutions functioning that ensure the solution of environmental, social and management problems:

1. Creation of a permanent GIS system for monitoring the state of the environment in the area of the Northern Sea Route, including ground stations and a satellite constellation. In the future, to transfer all vessels to use natural gas motor fuel, this will significantly reduce the likelihood of marine disasters with a negative impact on the environment.

2. Creation of a unified information system for managing northern delivery, which would reflect all information about the required cargos, the scope and timing of their delivery, storage and transportation conditions, as well as their location. This will allow more efficient use of available budgetary resources.

3. Formation at the federal level of a subsystem for forecasting the development of cargo transportation along the Northern Sea Route, subject to increased responsibility of extractive industry companies for the implementation of investment projects on time (a unified subsystem for forecasting and monitoring). The state invests significant budgetary funds in the development of the infrastructure of the Northern Sea Route in the expectation of an increase in the scopes of transportation by private companies. Only the cost of building two nuclear icebreakers of the Leader project is more than 250 billion rubles, and the total cost of building icebreakers exceeds 500 billion rubles in 2020 prices.

However, there are risks that the capacity of these icebreakers will be excessive at today's growth rates of cargo transportation. Therefore, violation of the terms for the development of mineral deposits should serve as a basis for revocation of licenses and exclusion of companies that committed violations from subsequent tenders for the development of minerals in the Northern Sea Route zone.

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