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Institutional Bases for The Formation of the Subject of Aviation Infrastructure Management in the System of Ensuring the Sustainability of the Northern Sea Route

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ABSTRACT

The development of the Northern Sea Route (NSR) infrastructure is one of the priority areas of managerial thought in the development of the Arctic zone of the Russian Federation. Commercial use of high-latitude caravan routes in the waters of the NSR should significantly change the situation with the organization of logistical maritime flows around the Eurasian continent. Ensuring uninterrupted traffic along with fulfilment of the conditions of urgency of delivery and cargo safety form the category of stability of the NSR functioning. Its northern part runs exclusively in domestic seas, and ensuring regular vessel traffic is Russia's priority task in the competition for transporting cargo from east to west (and back) by sea. The movement of ships along the NSR falls directly under the authority of the management of Rosatom State Corporation, while the management of the infrastructure that ensures the continuous movement of transport along the NSR is carried out collegially. At the same time, such an important aspect as the management of the infrastructure complex supporting the movement of container ships with transit cargo has been assigned to three components of a single management entity: the Ministry of Transport of the Russian Federation, the Ministry of the Russian Federation for the Development of the Russian Far East and the Arctic, and Rosatom Corporation, without clearly defining the boundaries of responsibility for interdepartmental management decisions. To date, this approach has already caused a series of organizational and technical difficulties. The aim of the study is to identify the rational organization of the infrastructure of the management subject, allowing to ensure the sustainability of the movement of passenger and cargo ships throughout the water area of the NSR; it is based on such scientific methods as induction, systematization, grouping Key results of the work may be in demand both in the course of scientific research in the field of infrastructure development in the regions of the Arctic zone of the Russian Federation, and in the framework of improving the existing management system of aviation infrastructure of these territories.

Keywords: management system; institutional approach to management; NSR management; NSR infrastructure

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INTRODUCTION

Ensuring the sustainability of traffic along the Northern Sea Route (NSR) routes implies unanimity of opinions on options for solving a multitude of issues, but those that affect federal interests remain open. The majority of unresolved (and unresolvable) problems fall within the sphere of interagency competences.

Modern scientists pay enough attention to the organisation of traffic and support of ships on the Northern Sea Route — this topic is widely covered in mass media. The Russian Federation Government Order No. 2115-o dated 01.08.2022 "On Approval of the Northern Sea Route Development Plan for the Period until 2035"[1] (hereinafter — Order No. 2115-o) states that from 2027 container ships will play a separate role in organising traffic along this sea route. This is about using the transcontinental opportunities of the shortest northern (high-latitude) routes in the Northern Sea Route, which unite the East and West of the Eurasia continent.

These routes are extremely complex, and their operation implies additional requirements to the organisation of work of the subject of continental infrastructure management.

Since the purpose of this study is to solve a number of problems related to the rationalisation of the process of managing the movement of ships along various routes in the Northern Sea Route, the author of the article had to solve the following tasks in the course of his work:

- to reveal the composition and organisation of the Northern Sea Route infrastructure development management institutions;
- identify the specific features of management objects in the Northern Sea Route infrastructure;
- identify inconsistencies in the planning of development and formation of infrastructure responsible for the movement of ships along the Northern Sea Route.

[1] Order of the Government of the Russian Federation No. 2115-o dated 01.08.2022. "On Approval of the Northern Sea Route Development Plan until 2035". URL: http://publication.pravo.gov.ru/Document/View/0001202208040008

METHODOLOGY

The research used the methods of induction; data systematisation to summarise the principles of interrelation and interaction of subsystems and elements included in the subject of Northern Sea Route development infrastructure management; grouping of theoretical approaches to the institutional principle of building the subject of Northern Sea Route infrastructure management. The main objective was to create such conditions for ship traffic, in which passengers and cargoes could count on operational support from the continent in the event of unforeseen situations.

The difficulty in operating the Northern Commercial Route is related to its geographical latitude. The organisation of year-round sustainable use of the Northern Sea Route has yet to be addressed, while also addressing the challenges of ensuring accessibility of high-traffic vessels through the use of Arctic aviation facilities and capabilities.

Several hundred billion roubles have already been invested in the construction of the newest icebreakers of the Leader series, capable of overcoming difficult ice conditions at high latitudes (75–77th degrees of northern latitude) in any season.

In this regard, a number of issues arise that are not disclosed in the governmental decrees defining the set of structural units that are responsible for managing the development of the Northern Sea Route along its entire route. In particular, the conditions for the operation of Arctic aviation technical facilities in the overall system of infrastructure support for the movement of passengers and cargo along the Northern Sea Route have not been defined. Such decisions should be made on the basis of interagency co-operation, which is difficult due to the limited timeframe for the implementation of the federal project and the strictly targeted financing of all its components.

It is important to note that in the current study the sustainability of the Northern Sea Route

should be understood as the organisation of the activities of all its subsystems, the implementation of which will allow passengers and cargo to move along the NSR routes without stopping and in accordance with the approved schedules regardless of changes in the external environment.

The main sources of legislation assigning to various state structures the scope and measure of responsibility for the implementation of management decisions were the Resolution of the Government of the Russian Federation "On Approval of the Rules of Navigation in the Northern Sea Route" and Order No. 2115-o.[2]

Separate problems of aviation infrastructure support development were raised in the works by O. G. Karpovich and A. I. Shlafman [1–3]. These authors showed the necessity of attracting the resources of domestic civil aviation to support the movement of passenger and cargo transport along the Northern Sea Route.

The works of A. A. Atroshenko [4], L. N. Babkina [5], and A. S. Buyanov [6] are devoted to general problems of regulating the development of this waterway under current conditions (including the management system). As for theoretical and methodological issues, E. P. Bashmakova and M. V. Ulchenko described the regional peculiarities of the Northern Sea Route infrastructure formation for the western territories of the Arctic zone of the Russian Federation [7]; K. P. Danilin and M. V. Ivanova [8], A. I. Ilyinsky [9] — pain points and organisational and economic problems that may arise during this process. D. A. Radushinsky [10] considers the difficulties of implementing investment projects related to the NSR infrastructure, and I. A. Toimentseva [11] — considers the interrelation of the Northern Sea Route transport system with other forms of transport organisation in the Arctic zone of the Russian Federation and their interdependence.

Modern foreign authors, such as H. Ahn [12], B. Scott [13], In. K. Lim [14], consider the improvement of aviation infrastructure as a priority direction of transformations in the implementation of state programmes.

The importance and prospects of the development of the transport artery under consideration is comprehensively reflected in the articles by V. V. Vasilieva [15], O. Y. Krasulina [16], Yu. Yu. Litvina [17].

The object of this study is organisational solutions to ensure the sustainability of passenger and cargo traffic following the Northern Sea Route, and the subject of this study is the theory and practice of creating a management structure for the implementation of infrastructure projects at the state level.

The Northern Sea Route traffic management system has been transformed with enviable regularity over the last century — in particular, the components of the property complex have been actively changed in order to ensure both greater reliability of vessel movements and information support for management decisions taken.

Until 1946, the Northern Sea Route was under the jurisdiction of the "Main Administration of the NSR", then, between 1953 and 1964, its management was transferred to the Ministry of Marine Transport of the USSR. From 1964 to 1970 there was a serious regrouping of the managed objects, which resulted in the formation in 1970 of the Administration of the Northern Sea Route under the Ministry of Marine Transport of the USSR [15]. In the interval from 1991 to 1993, traffic issues along the Northern Sea Route were under the control of the authorities of the regions where the property components of the Northern Sea Route were located.

2013 was the year of the waterway's ideological revival — a new Administration of the Northern Sea Route was established under the Federal

[2] Resolution of the Government of the Russian Federation of 18.09.2020 No. 1487 "On Approval of the Rules of Navigation in the Northern Sea Route Water Area". URL: https://rostransnadzor.gov.ru/documents/categories/79/document/3805 (accessed on 20.05.2024).

Agency for Marine and River Transport, which later became part of one of the structures of Rosatom State Corporation — the Federal State Budgetary Institution "Main Administration of the Northern Sea Route" ("GlavSevmorput" = "MainNorternSeaRoute").[3]

This Federal State Budgetary Institution received broad powers to organise, plan, record, control and analyse ship traffic along the Northern Sea Route (*Fig.*).

To date, Rosatom's forces have effectively implemented transportations along the southern routes of the Northern Sea Route, which provide resource supply to the territories of the Arctic zone of the Russian Federation in the context of interregional interests. These routes are conditionally divided into eastern and western corridors by the Taimyr Peninsula.

It should be noted that the Northern Sea Route has another important purpose — it is an alternative when it comes to delivering cargo from Asia to Europe (the direct option is via the southern seas and the Suez Canal). Its availability is due to the peculiarities of the globe structure and the technical development of the Russian icebreaker fleet designed for transcontinental transportations.

At the same time, the time saving of cargo delivery from the southern provinces of China to European ports is measured not in hours and minutes, but in days (up to a week), and it is achieved due to high latitude traffic in the Northern Sea Route waters along the 75th degree of northern latitude and to the north. Both shippers, consignees and carriers, as well as Russia as a country in whose territorial waters the northern part of the Northern Sea Route routes passes, are interested in organising such communication.

As of the beginning of 2024, icebreaker-supported vessel traffic from Murmansk to the Taimyr Peninsula and from the eastern border of the latter to the Bering Strait is quite regular at low latitudes (50–100 km from the continental coast). And the majority of cargo traffic passes through straits of shallow (up to 20 m) depth in the eastern part of the Northern Sea Route under the Novosibirsk Islands.

A set of problems, ways to resolve them and prospects for the development of traffic along the Northern Sea Route were fixed in the Strategy for the Development of the Arctic Zone of the Russian Federation and National Security until 2035 (hereinafter — the Strategy). In particular, the document states that "the importance of the Northern Sea Route as a transport corridor of global significance used for the transport of national and international cargoes will increase as a result of climate change and the development of year-round navigation throughout the entire water area of the Northern Sea Route".[4]

The Strategy also states that "the fulfilment of the main objectives in the field of infrastructure development in the Arctic zone is ensured through the implementation of the following measures[5]:

a) integrated development of seaport infrastructure and maritime shipping lanes in the waters of the Northern Sea Route, Barents, White and Pechora Seas;

b) establishment of a maritime operations headquarters to manage navigation throughout the entire water area of the Northern Sea Route;

c) unification of transport and logistics services provided in the waters of the Northern Sea Route on the basis of a digital platform designed for paperless registration of multimodal transport of passengers and cargo".

[3] Resolution of the Government of the Russian Federation of 18.09.2020 No. 1487 "On Approval of the Rules of Navigation in the Northern Sea Route Water Area". URL: https://rostransnadzor.gov.ru/documents/categories/79/document/3805 (accessed on 20.05.2024).

[4] Decree of the President of the Russian Federation of 26.10.2020 No. 645 "On the Strategy for the Development of the Arctic Zone of the Russian Federation and National Security until 2035". Section II, p. 5, item "d". URL: http://www.kremlin.ru/acts/bank/45972 (accessed on 20.05.2024).

[5] Ibidem. (version of 27.02.2023 No. 126). Section III, p. 10, item "e"; ibid. Section III, para. 13.

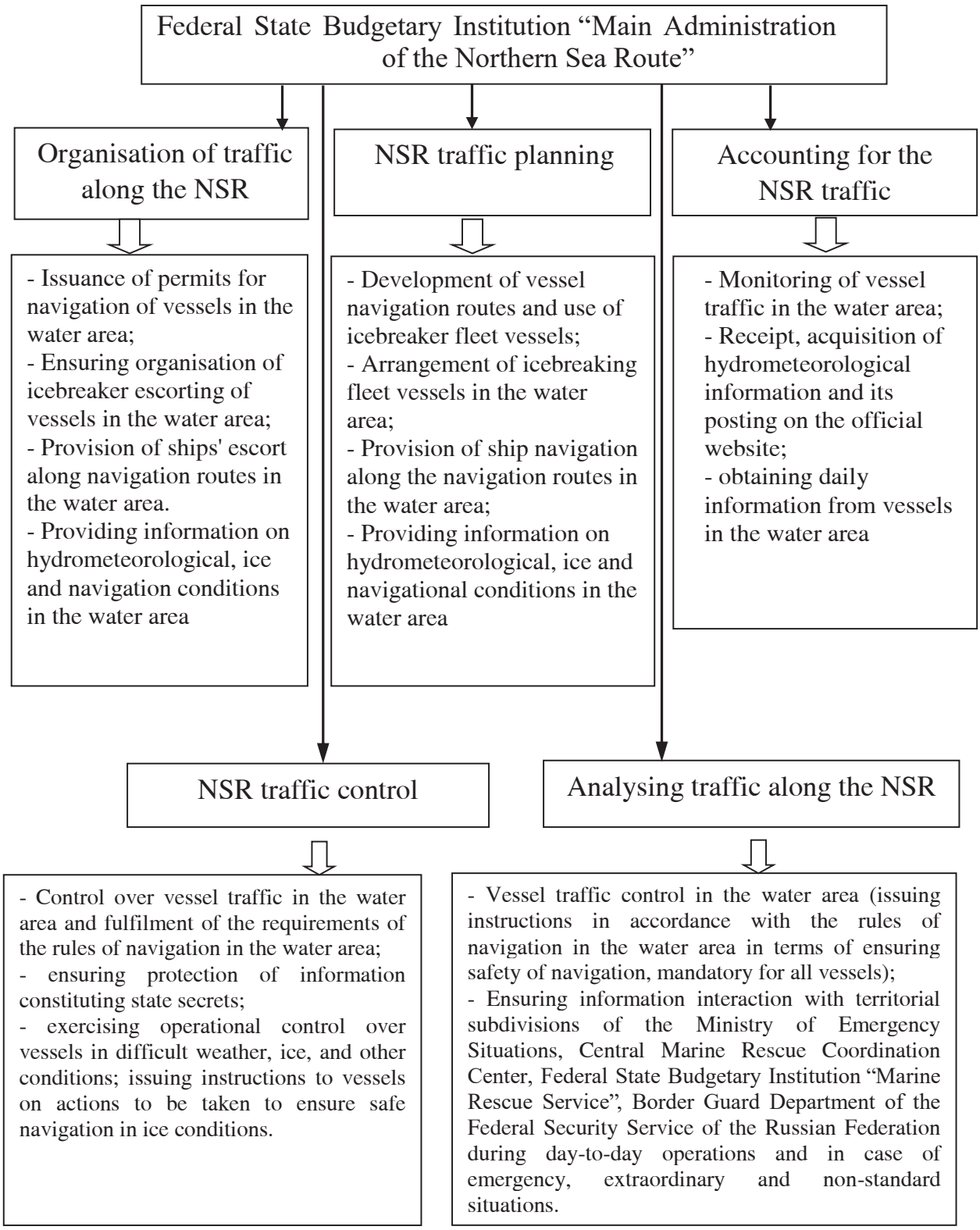

Fig. **Traffic control functions along the NSR implemented by the Federal State Budgetary Institution "Main Directorate of the Northern Sea Route"**

Source: compiled by the authors.

The authors of the draft law, having a broad vision, taking into account the targeting of requirements, emphasise the importance of the Northern Sea Route for transcontinental international shipping, but in defining the boundaries of the development of the infrastructure of the marine artery are limited to the interests and capabilities of regional authorities. The document does not reflect the interests of all participants of the Arctic zone of the Russian Federation and the needs of navigation.

This position appears to be limited and is not based on the experience of operating the Northern Sea Route in the last century. Thus, in the USSR, polar aviation, as an integral part of the Northern Sea Route infrastructure, in the 1930s-1960s was under the direct responsibility of the Polar Aviation Directorate of the Main North Sea Route.

"Polar aviation is a special type of military transport and civil aviation designed to provide logistics for passenger and special transport, observation flights in the polar regions of the Northern and Southern Hemispheres, originated in the USSR. Usually, such tasks are performed abroad by Air Force units. It is with the formation and development of polar aviation that the systematic study and development of the Arctic and the Northern Sea Route and Antarctic research is connected" [6, p. 27].

It is this aspect of the Northern Sea Route infrastructure development that is not adequately reflected in the reviewed Strategy.

STRUCTURE AND COMPOSITION OF THE SUBJECT OF AVIATION INFRASTRUCTURE MANAGEMENT IN THE ARCTIC ZONE OF THE RUSSIAN FEDERATION

The management system of aviation infrastructure in the Arctic zone of the Russian Federation has been fragmented — on the basis of the Decree of the Government of the Russian Federation "On Approval of the Rules of Navigation in the Northern Sea Route" and Order No. 2115[6] infrastructure development efforts have been assigned to two enlarged groups.

The first should include the federal districts, the Ministry of Transport and the Ministry of Industry and Trade, whose area of responsibility has become the solution of tasks to organise the provision of the continental territories of the Arctic zone of the Russian Federation with the necessary resources. These subjects determine the need to expand the spheres of application of civil aviation, form requests to the Federal Agency "Rosaviation" regarding the modernisation of the aviation infrastructure of the Arctic zone of the Russian Federation and set tasks for it to repair, build and commission new elements of this infrastructure.

The second group of actors managing the development of aviation infrastructure in the Arctic zone determines the need for its development in order to organise support for traffic on northern rivers and seas. This group primarily includes Rosatom, the Ministry of Eastern Development and, of course, the Ministry of Emergency Situations.

Both of these groups interact with the Federal Air Transport Agency ("Rosaviation") at the stage of ready-made solutions, forming the requirements for the work.

The needs of the management subjects of both groups are broadly divided into two components: in the western part of the Arctic zone of the Russian Federation, modern technical solutions based on the existing subsystems of aviation infrastructure are in demand, while in the eastern part, the development problems largely consist in the formation of new components of aviation

[6] Resolution of the Government of the Russian Federation of 18.09.2020 No. 1487 "On Approval of the Rules of Navigation in the Northern Sea Route Water Area". URL: https://base.garant.ru/74664152/ (accessed on 20.05.2024); Russian Government Order No. 2115-o dated 01.08.2022 "On Approval of the Northern Sea Route Development Plan for the Period until 2035. URL: https://www.garant.ru/products/ipo/prime/doc/405010751/ (accessed on 20.05.2024).

infrastructure.

OBJECTS OF AVIATION INFRASTRUCTURE MANAGEMENT IN THE ARCTIC ZONE OF THE RUSSIAN FEDERATION

"Aviation infrastructure in the Russian Federation means aerodromes, airports, facilities of the unified air traffic management system, aircraft flight control centres and points, points for receiving, storing, and processing information in the field of aviation activities, facilities for storing aviation equipment, centres and equipment for flight crew training, and other facilities and equipment used in aviation activities" [8].

In the Arctic zone of the Russian Federation, these components are supplemented by autonomous life support systems and ecological waste disposal structures, also provided with autonomous devices for supplying the necessary resources. These peculiarities of the elements of management facilities are related to the fact that in most Arctic Russian territories (where aviation infrastructure facilities are located) it is impossible to apply a comprehensive approach typical for densely populated regions of the Russian Federation.

The heterogeneous socio-economic development of the Arctic zone of the Russian Federation implies the emergence of priority solutions to ensure the autonomous operation of aviation infrastructure facilities. For example, on the coast of the Sannikov Strait, which is quite developed in terms of communications but is considered a specially protected area of the Russian Federation, additional measures to ensure environmental safety will be required.

Another peculiarity of the facilities forming the aviation infrastructure in the region under consideration is the fact that in the points of their location conditions should be created to facilitate the realisation of a variety of logistical tasks typical for the northern territories, which are divided into basic and special ones. The former include ensuring accessibility of remote ecosystems, cultural and leisure centres, and agglomerations. The latter include the provision of emergency medical care and rescue operations in difficult Arctic conditions, as well as comprehensive support for transit operations with passengers and goods.

At the same time, management objects can be divided into those *with a wide range of functions* (providing opportunities to organise regular life and economic relations in the Arctic zone of the Russian Federation) and *specialised ones*, whose activities are aimed at the implementation of special tasks related to transit procedures.

Of course, mixed solutions are also possible, but today they are more expensive from the point of view of financing organisation and require separate approaches. In turn, both special facilities and facilities with a wide range of functions require systemic management. Unfortunately, at present, the development of management objects in the system of aviation infrastructure support for the development of the Arctic zone of the Russian Federation is carried out on a declarative basis.

The condition of most of them, especially in the eastern part of the Arctic zone, could be called neglected before 2013. Thanks to the improvement of the Northern Sea Route and the expansion of the range of Northern Shipping, some facilities have received support, in particular, within the framework of the approved plans for the development of the region, the Strategy and Order No. 2115, work is underway to modernise and rehabilitate those of them that have retained basic technical solutions for handling aircraft; in the future, it is possible to build the necessary facilities from scratch.

A number of classification features of management objects are shown in the *Table 1*.

It should be emphasised that the legal and regulatory documents governing the commissioning of new management facilities

Table 1

Classification of aviation infrastructure development management facilities in the Arctic zone of the Russian Federation

By comparison criterion	Objects of management of aviation infrastructure development Arctic zone of the Russian Federation
By administrative-territorial division	Murmansk region Arkhangelsk region Nenets Autonomous District Yamalo-Nenets Autonomous District Krasnoyarsk Territory Sakha Republic Chukotka Autonomous District Komi Republic
By continental distribution	Eastern part of the Arctic zone of the Russian Federation Western part of the Arctic zone of the Russian Federation
By the need for autonomous solutions	Full autonomous life support of control facilities Priority areas for ensuring autonomy of control facilities Connection of facilities to regional network solutions
By the set of functions performed	Special purpose With a wide range of functional solutions Mixed type
By reasons of occurrence	Private initiative Federal project Regional needs
	Modernisable Renovated Built from scratch

Source: compiled by the author based on the Federal Law of July 13, 2020 No. 193-FL "On state support for entrepreneurial activity in the Arctic zone of the Russian Federation". URL: https://www.consultant.ru/document/cons_doc_LAW_357078/

contain rational solutions that contribute to the achievement of the set objectives, but are not the result of consistent planning of aviation infrastructure development.

The above-mentioned Resolution of the Government of the Russian Federation approving the rules of navigation along the Northern Sea Route[7] defines the maximum limits for the movement of icebreakers and caravans led by them along the southern, intermediate, and northern routes. At the same time, the document does not rely in any way on the possibilities of ensuring uninterrupted passage of ships along the upper routes — the remoteness of the extreme upper latitudes (up to the 8th degree of northern latitude) is so great that the probability of organising its support is questionable. This Resolution was probably drafted and approved without agreeing on the conditions for such assistance from Arctic aviation.

Such a conclusion can be reached by a modern

[7] Resolution of the Government of the Russian Federation of 18.09.2020 No. 1487 "On Approval of the Rules of Navigation in the Northern Sea Route Water Area". URL: https://rostransnadzor.gov.ru/documents/categories/79/document/3805 (accessed on 20.05.2024).

Table 2

Institutions as part of the NSR infrastructure management entity

Name of the Institute	Formats of international cooperation with states and business	Promoting the image of the NSR, competitiveness and environmental sustainability	The concept of the project to create a transarctic operator	Updating the proposals of the necessary infrastructure for the safety and efficiency of navigation, taking into account the forecast of ship traffic	Equipping of the Arctic integrated emergency rescue centers of the Ministry of Emergency Situations of Russia 9 MI 38 helicopters, 4 Mi 8 helicopters (6 points)	Preparation of proposals for the creation of operational ice reconnaissance facilities based on UAVs	Amendments to the rules of navigation in the waters of the NSR	Preparation of proposals for the development of the infrastructure of the transit container operator project based on the results of the pilot project in 2027
Ministry for the Development of the Russian Federation	+	+	+					+
State Atomic Energy Corporation ROSATOM	+	+	+	+		+	+	+
Ministry of Economic Development of Russia	+	+	+					
Ministry of Foreign Affairs of Russia	+	+						
Ministry of Transport of Russia	+		+	+			+	+
Ministry of Natural Resources of Russia		+						
Ministry of Industry and Trade			+			+		
Russian Ministry of Finance			+					
Russian Hydrometeorology and Environmental Monitoring service				+			+	
Russian Ministry of Emergency Situations					+			
Ministry of Education and Science						+		

Source: Compiled by the author based on the order of the Government of the Russian Federation dated August 1, 2022 No. 2115-r "On approval of the development plan for the Northern Sea Route for the period up to 2035". URL: http://publication.pravo.gov.ru/Document/View/0001202208040008; [2].

researcher, realising that support to ships from the continent will be provided by a helicopter fleet, the greatest range of loaded vehicles of which is 550–600 km, while the 80th latitude is 700–800 km away from the continental coast in some areas.

Order 2115-o is the last of the approved draft laws affecting the specifics of the Northern Sea Route infrastructure. This document comprehensively describes the problem of organisation, infrastructure, establishment, development, and operation of the Northern Sea Route, but it does not pay special attention to polar aviation.

RATIONAL STRUCTURE OF THE SUBJECT OF MANAGEMENT OF SHIP TRAFFIC INFRASTRUCTURE ON THE NORTHERN SEA ROUTE

A number of structures of the state apparatus (which does not include the Federal Agency "Rosaviation") are responsible for various projects on the organisation of the Northern Sea Route infrastructure (according to Decree 2115-o) (*Table 2*).

This kind of organisational solution leads to disputable situations (especially during the period of operation of the upper NSR routes), but does not exclude the possibility of using the Federal Agency "Rosaviation" as a deliberative and consultative body.

It should be noted that the institutional approach is built around ensuring the sustainability of the activities of the main operator of the Northern Sea Route — Rosatom State Corporation. As Rosatom achieves certain goals and objectives, such domestic structures as the Ministry of the Russian Federation for the Development of the Russian Far East and the Arctic, the Ministry of Economic Development, the Ministry of Natural Resources, the Ministry of Transport, the Ministry of Industry and Trade, the Ministry of Finance, the Federal Service for Hydrometeorology and Environmental Monitoring, the Ministry of Emergency Situations, the Ministry of Education and Science are being involved.

The first three of the listed ministries deal with strategic development issues, determine the prospects for setting and solving fundamental tasks that affect national economic problems requiring the use of new opportunities of the Northern Sea Route.

The Ministry of Finance joins the declared participants at the stage of forming conceptual proposals on the organisation of carriers" activities along the Northern Sea Route.

The Ministry of Emergency Situations (in isolation from other agencies) is in charge of equipping rescue teams, the places for their work along the entire route must be designed by someone. According to Decree 2115-o, the functions of the established institute for managing infrastructure support for the Northern Sea Route development do not include either such design or the need to carry out such works.

The Ministry of Industry and Trade, with the support of the Ministry of Education and Science, is assisting Rosatom with the development of UAV operation systems, but without the participation of the federal agency Rosaviation, which actually certifies such aircraft.

The Russian Ministry of Foreign Affairs is involved in the formation of a trans-Arctic operator, whose routes will go above latitude 75, which, in the absence of established support from the continent, seems risky on autonomous routes of more than 2 weeks in Arctic conditions.

Expansion of trade relations, development of such industries as mining and manufacturing in the region require accessibility of multiple territories separated from each other by many kilometres in the absence of regular highway connections.

Research and justification of new opportunities for the development of the Arctic and its riches is also impossible without the use of polar aviation, whose leading role in the realisation of interaction with remote areas and facilities remains in the shadows. At the same time, urgent issues related

to transport in this region can be solved only by polar aviation forces.

Its work is inextricably linked to the development of aviation infrastructure in the Arctic zone of the Russian Federation, the current state of some subsystems of which requires modernisation. At the same time, in order to implement many tasks in the aviation infrastructure, it is necessary to form new management objects.

On the one hand, the Administration of the President of the Russian Federation is already forcibly pushing for the implementation of a large-scale project within the framework of Order 2115-o (contributing to the development of the potential of the Arctic zone of the Russian Federation[8]), but in the work on which (using the principles of decentralisation of the management decision-making process) the essential components of the infrastructural development of the region, primarily polar aviation, are overlooked.

On the other hand, the subjects of management of infrastructure development in the Arctic zone of the Russian Federation in their current form represent a set of state agencies and state corporations with their own goals and objectives, which duly fulfil the decrees of the Cabinet of Ministers,[9] but do not take initiatives in relation to problem areas of infrastructure development, which they cannot fail to notice.

The main beneficiaries in the implementation of the project of development of the Arctic zone of the Russian Federation[10] are the federal districts, whose activities take place within the administrative boundaries. The strategic vision of measures for integrated utilisation of the infrastructure projects being built is overlooked. Thus, the problems of a limited number of small nationalities are solved, and the possibilities of exploiting the infrastructure for the development of related projects and, first of all, the Northern Sea Route are reduced.[11] Federal districts, forming the boundaries of their responsibility in this area, are immersed in solving their own, rather than interregional and interdepartmental problems.

Within the framework of the global socio-economic task of organising the movement of passengers and cargo along the Northern Sea Route, a circle of responsible ministries and agencies is being formed, united by a common idea and, accordingly, forming an independent management institution.

It follows that this subject of infrastructure project management, formed according to the institutional principle, should cover a wide list of goals and objectives for the organisation and development of the Northern Sea Route. At the same time, private problems related to the movement of passengers and cargo turn into complex ones, and the most important among them is the development of transcontinental movement of container ships.

The management of the infrastructure ensuring the functioning of this route is the responsibility of three agencies, for which the smooth movement of container ships is not a priority task. However, this problem is now acute for the new management subject, requiring in-depth study with the definition of an independent mechanism for the management of various components of infrastructure support for the movement of container ships along the Northern Sea Route. We are talking about the realisation of the transit

[8] List of instructions based on the results of the meeting on the development of Far Eastern cities (approved by the President of the Russian Federation on 07.11.2023, No. Pr-2217). Item 14. URL: https://www.garant.ru/products/ipo/prime/doc/407852303/ (accessed on 20.05.2024).

[9] Resolution of the Government of the Russian Federation of 18.09.2020 No. 1487 "On Approval of the Rules of Navigation in the Northern Sea Route Water Area" URL: https://rostransnadzor.gov.ru/documents/categories/79/document/3805 (accessed on 20.05.2024)

[10] Decree of the President of the Russian Federation of 26.10.2020 No. 645 "On the Strategy for the Development of the Arctic Zone of the Russian Federation and National Security until 2035". Section II, p. 5, item "d". URL: http://www.kremlin.ru/acts/bank/45972 (accessed on 20.05.2024).

[11] Order of the Government of the Russian Federation of 01.08.2022 No. 2115-r «On approval of the Northern Sea Route development plan for the period up to 2035». URL: https://www.garant.ru/products/ipo/prime/doc/405010751/ (accessed on 20.05.2024).

route at latitude 75–77th degrees north latitude, for which new icebreakers are being built.

Despite the obvious priority of implementing decrees and resolutions to the detriment of the obvious needs of the region's aviation infrastructure development, it is its role that is leading the way in following the instructions of these same regulations. It is the lost link that should take an independent place in the concept of development of the Arctic zone of the Russian Federation.

By using the transcontinental high-latitude route in the Northern Sea Route, the country can win the competition for cargo traffic from friendly countries such as India, Arab countries, China, and so on.

Only the high-latitude route actually reduces the length of the journey and allows the passage of modern container ships with a carrying capacity of more than 100,000 tonnes.

This route, unfortunately, falls outside the sphere of interest of both Rosatom and the Ministry of Transport. And it is the one that is not supported by helicopters from the onshore aviation infrastructure.

Rosatom State corporation has no authority to manage these facilities. In its organisational contour there are three subordinate organisations that provide activities on the Northern Sea Route: Federal state unitary enterprise "Atomflot", Federal state unitary enterprise "Hydrographic Enterprise, and Federal State Budgetary Institution "Main Northern Sea Route", but none of them is involved in aviation issues.

The Ministry of Transport, in its turn, does not consider the problems of high-latitude ship routes in the waters of the Northern Sea Route without objective information on the existence of problems on these routes, or, in other words, does not analyse the prospective traffic directions defined by Order No. 2115-o, but serves the agenda of the operator of the Northern Sea Route — Rosatom. In its turn, the Ministry for the Development of the Russian Far East and Arctic deals exclusively with the problems of its regions and coastal territories — the issues of the remote high-latitude route of ships travelling along the Northern Sea Route waters are not their core issues.

Thus, it is not clear how the urgent problems of infrastructure support of passenger and cargo traffic along the high routes of the Northern Sea Route water area will be solved in isolation from rational decisions regarding the use of polar aviation capabilities and how the subject of Northern Sea Route infrastructure management formed on the institutional principle will be able to coordinate its activities with the Federal Agency "Rosaviation". Hypothesis building and search for rational answers to these questions may become the basis for future studies.

Objectively, it is necessary to revise the interaction of the above-mentioned management institutions in favour of the creation of a monitoring centre, whose activity should consist in the analysis of promising development directions and identification of probable problems and risks on the way to the formation of the infrastructure for ship traffic along the new transcontinental sea artery, allowing Russia to become a real competitor for the implementation of passenger and cargo transportation from the east to the west of the Eurasian continent and in the opposite direction.

There is also an urgent need to activate the subject of management of this infrastructure. At the forefront is the development and rapid implementation of a unified strategic plan, including the development of its aviation component, which can both help in the implementation of major federal projects and become the foundation for meeting the needs of socio-economic systems that serve the development of the small peoples of the North and the Russian Arctic as a whole.

RESULTS

The study identifies eight institutions within the Northern Sea Route development infrastructure management entity. They are grouped around

the key objectives of the Northern Sea Route development, which are as follows:

1) defining the formats of international co-operation with the state and business in the use of ship traffic routes in the Northern Sea Route water area;

2) promotion of the image of the Northern Sea Route from the standpoint of competitiveness of the routes themselves and compliance with the principles of environmental friendliness during their operation;

3) development and implementation of the project concept for the creation of a trans-Arctic operator;

4) updating of proposals for the development of the necessary infrastructure for the safety and efficiency of navigation, taking into account the forecast of ship traffic;

5) equipping Arctic complex rescue centres of the Russian Ministry of Emergency Situations with helicopters;

6) preparation of proposals for the creation of UAV-based operational ice reconnaissance equipment;

7) amendments to the rules of navigation in the waters of the Northern Sea Route;

8) formation of proposals for the development of the infrastructure of the transit container operator project based on the results of the pilot project in 2027.

In the course of the work the author of the article has determined the composition of management subjects and the boundaries of formation of management decisions.

CONCLUSIONS

In the current system of management of the Northern Sea Route development infrastructure, the link between the aviation part of it and the relevant management entity has been lost. The Federal Agency "Rosaviation" can become such a link if this agency is initiated at the federal level to integrate into the system of institutions that form the subject of infrastructure management.

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