

БЕЗОПАСНОСТЬ В ЧРЕЗВЫЧАЙНЫХ СИТУАЦИЯХ

SAFETY IN EMERGENCY SITUATIONS

УДК 004.9, 332.02

doi:10.21685/2307-4205-2021-3-13

REGULATORY ENSURING OF THE ENVIRONMENTAL SAFETY IN THE ARCTIC REGION OF RUSSIA

A.V. Masloboev¹, V.A. Masloboev²

¹ Institute of Informatics and Mathematical Modelling of Technological Processes of Kola Science Centre
of the Russian Academy of Sciences, Apatity, Russia

² Institute of North Industrial Ecology Problems of Kola Science Centre
of the Russian Academy of Sciences, Apatity, Russia

¹ andrejmasloboev@mail.ru, ² v.masloboev@ksc.ru

Abstract. *Background.* The study summarizes and logically proceeds with the research aimed at development of normative and information-analytical support of the environmental safety in the regions of the Russian Arctic. *Materials and methods.* The national public standard «Environmental safety of the Arctic» corresponding a set of conduct rules of the accounting entities in the Arctic region has been developed. The basic ideological statements and design principles of the public standard of environmental safety ensuring in the Arctic region are considered. *Results and conclusions.* The analysis of concordance and relevance of the developed standard to international documents on sustainable development and well-known practices of the corporate social responsibility of business is carried out. The preliminary expert judgment of the standard application by business entities within the various types of economical activities in the Arctic region is given. The ways of standard implementation into practice are proposed.

Keywords: regulatory ensuring, national public standard, environmental safety, management, sustainable development, Arctic region of Russia

Acknowledgments: the research was carried out within the framework of the State Research Program of the INEP KSC RAS and IIMM KSC RAS as well as partially sponsored by the Russian Foundation for Basic Research under grant No. 18-05-60142 «Arctic».

For citation: Masloboev A.V., Masloboev V.A. Regulatory ensuring of the environmental safety in the Arctic region of Russia. *Nadezhnost' i kachestvo slozhnykh sistem = Reliability and quality of complex systems.* 2021;(3):98–108. doi:10.21685/2307-4205-2021-3-13

НОРМАТИВНОЕ ОБЕСПЕЧЕНИЕ ЭКОЛОГИЧЕСКОЙ БЕЗОПАСНОСТИ АРКТИЧЕСКОЙ ЗОНЫ РОССИИ

А. В. Маслобоев¹, В. А. Маслобоев²

¹ Институт информатики и математического моделирования технологических процессов
Кольского научного центра Российской академии наук, Апатиты, Россия

² Институт проблем промышленной экологии Севера
Кольского научного центра Российской академии наук, Апатиты, Россия

¹ andrejmasloboev@mail.ru, ² v.masloboev@ksc.ru

Аннотация. *Актуальность и цели.* Работа является логическим продолжением и обобщением исследований, направленных на развитие нормативного и информационно-аналитического обеспечения экологиче-

ской безопасности регионов Арктической зоны России. *Материалы и методы.* Разработан национальный общественный стандарт «Экологическая безопасность Арктики», представляющий собой свод правил поведения хозяйствующих субъектов в Арктической зоне. Рассматриваются основные идеологические положения общественного стандарта обеспечения экологической безопасности арктических регионов и принципы его построения. *Результаты и выводы.* Проведен анализ согласованности и релевантности разработанного стандарта международным документам по устойчивому развитию и известным практикам корпоративной социальной ответственности бизнеса. Дана предварительная экспертная оценка применимости стандарта предприятиями при различных видах хозяйственной деятельности в Арктической зоне. Предложены пути внедрения стандарта в практику.

Ключевые слова: нормативное обеспечение, национальный общественный стандарт, экологическая безопасность, управление, устойчивое развитие, Арктическая зона России

Финансирование: работа выполнена в рамках государственного задания ИППЭС КНЦ РАН и ИИММ КНЦ РАН, а также при частичной поддержке РФФИ (проект № 18-05-60142 «Арктика»).

Для цитирования: Маслобоев А. В., Маслобоев В. А. Нормативное обеспечение экологической безопасности Арктической зоны России // Надежность и качество сложных систем. 2021. № 3. С. 98–108. doi:10.21685/2307-4205-2021-3-13

Introduction

Nowadays the Arctic region seems not just a territory. It is an area of various activities and interests interweaving which are often in conflict with each other. Today, we perceive there is an objective need to efficient interaction organizing between population, government and business in order to enable the territory developing and preserving its natural values at the same time. Regulatory legal acts cannot provide for all aspects of interaction between the population and business in the territory acting. A social compact is required that defines the principles of conduct for any type of activities. In our case, one of the forms of such social compact can be the national public standard for ensuring environmental safety in the Arctic region (NPSESA).

A cooperative understanding of the urgent necessity of environmental-friendly regulations establishment for all economic entities in the Arctic region was reached in 2015. As a result, at the committee session of the Inter-regional Public Organization "Association of Polar Explorers" (ASPOL) a key decision to NPSESA developing startup was made. The structure and principal statements of NPSESA was approved on December 7, 2015. In the issue of NPSESA project work during 2016 the NPSESA submitting format and framework were changed. Initially, it was considered that NPSESA principles should be formulated for the each area of economic activity in Arctic region. Then, a NPSESA format was proposed and adopted which firstly formulates the principles for acting economic entities and within the framework of each principle the sectoral specificity is in detail considered and analyzed. The NPSESA project was finally reconciled and adopted on October 28, 2016. Such NPSESA formatting allows making the NPSESA itself to be more compact, since there is no need to replicate the formulations of each principle for several types of activity.

The NPSESA was developed at the initiative of Public Joint Stock Company "ROSSETI". The NPSESA is a social compact between society and enterprises which is not regulated by the state, does not conflict with the existing regulatory framework, but only supplements it. These are implicit rules of conduct that should be present in all activities of enterprises located in the Arctic region of Russia. The main real-world problem is to define clear organizational principles for the enterprises own activity upon the path of environmental safety ensuring.

Current study is a generic summary of the author's research work [1–4] in the field of information, analytical and regulatory support means development for the environmental safety management in the Arctic region of Russia. Our study is based on the obtained results of long-term research aimed at developing of favorable conditions, management structure and methods to support the safe and sustainable development of regional socio-economic systems in the Russian Arctic.

Framework of NPSESA

The logical structure of NPSESA has a conventional format and is designed as follows.

The introduction that provides understanding of necessity and timeliness of the NPSESA implementation. In addition, the introduction describes the issues that became the reason for a universal document development for all sectors of economic activity in the Arctic region.

The declaratory part of NPSESA reflects the refraction of sustainable development principles in management and economic activities to environmental safety ensuring in the Arctic region. The declaratory

part provides clear understanding that NPSESA is a logical continuation of the general and special principles of environmental safety ensuring under specific conditions in the Arctic region.

The methodological part of NPSESA provides a possibility for economic entities to assess how the enterprise activities comply with the postulates declared in NPSESA. The assessment procedure can be implemented independently by the economic entities themselves or via involving the experts. The methodological part is based on the logical scheme "Principle – criterion – indicator – index". The construction principle of this part is a universal unit for all the sectors of economic activity. In total, eight basic principles of organizing activities for an economic entity which provide environmental safety ensuring have been identified. The criteria reflect the variability of principles working and take into account the sectoral specificity of the principles implementation. The indicator provides a possibility to accounting the implementation of criterion in the enterprise reporting matrix. The index is a quantitative implementation of an indicator. The indicator can be either measurable, i.e. taken into consideration quantitatively, or binary, i.e. based on the principle of binary code "exist / absent". For these indicators and indices comprehensive estimation and analysis state-of-the-art models and techniques, e.g. discussed in [5–8], can be well used.

The final statements and contributions of NPSESA are generating the conception of the further directions and means of NPSESA development. Annexes to NPSESA contain special documents such as "Regulatory materials", "Sectoral codes of best practices for environmental safety ensuring in the Arctic region", "Methodical guidelines for NPSESA implementation at the enterprises", "The voluntary accession procedure to NPSESA", etc.

Methodological principles of NPSESA

Methodologically, NPSESA is based on the key principles of sustainable development theory. The main principle is "destruction of barriers" which recognizes the equivalence of social economic and environmental aspects of any activity when choosing a development strategy. Acting enterprises cannot profit earning at the expense of its economic or other activities that destroy viability of the local communities or cause the environmental harm. The embodiment of this principle pass through the entire document. Especially clearly it is shown by the example of the following sections of NPSESA [9]: section 4.4 "The principle of rights and interests accounting of native people – the legal and traditional rights of native people to own, use and manage their lands, territories and resources must be recognized and respected"; section 4.5 "The principle for reasonable nature management in the Arctic region – organization business activity should facilitate the effective complex and wasteless (if possible) use of nature resources in order to increase the economic effectiveness and get a wide range of environmental and social benefits" enclosing the NPSESA criterion 4.5.3 "Business activities of the certified organization shall be aimed at strengthening and diversifying the local economy in order to avoid its dependence on one type of product. As the organization of practical nature protection measures depends on the conditions of local economy"; section 4.6 "Minimization principle for negative impact on the environment – business activity maintained by the certified organization shall guarantee preservation of biological diversity and related values, water resources, soils, and unique and fragile ecosystems and landscapes; by this means environmental functions and ecosystem integrity of Arctic will be preserved".

The composition and hierarchy of NPSESA principles is schematically shown in Fig.1.

Implementation of this principle in the organization plan of measures to ensure environmental safety should be reflected when planning any new activity, the principle of preservation of existing ecosystems must be respected; any economic activity should bring an improvement of living conditions of the local population; environmental impact assessment and assessment of the impact on local communities should be carried out not only at the project planning stage, but periodically (one time in 2 years) by independent researchers with the development of plans for improvement the ecological and social situation.

The NPSESA principles also correspond to the best existing practices in the field of corporate social responsibility (CSR). Social responsibility can be conditionally divided into five stages in accordance with model proposed by M. Porter and M. Kramer in [10]. Compliance with the NPSESA encourages functioning of enterprises according to the highest development stages of corporate social responsibility. This is both a strategic stage when the enterprise integrates CSR into its development strategy focusing on the long-term perspectives (principles 4.5, 4.7, 5 of NPSESA), and a civil stage when the enterprise makes efforts to promote the CSR principles (NPSESA) in the business community. That is carried out by supporting the awareness and demanding the enterprise suppliers to comply with the NPSESA.

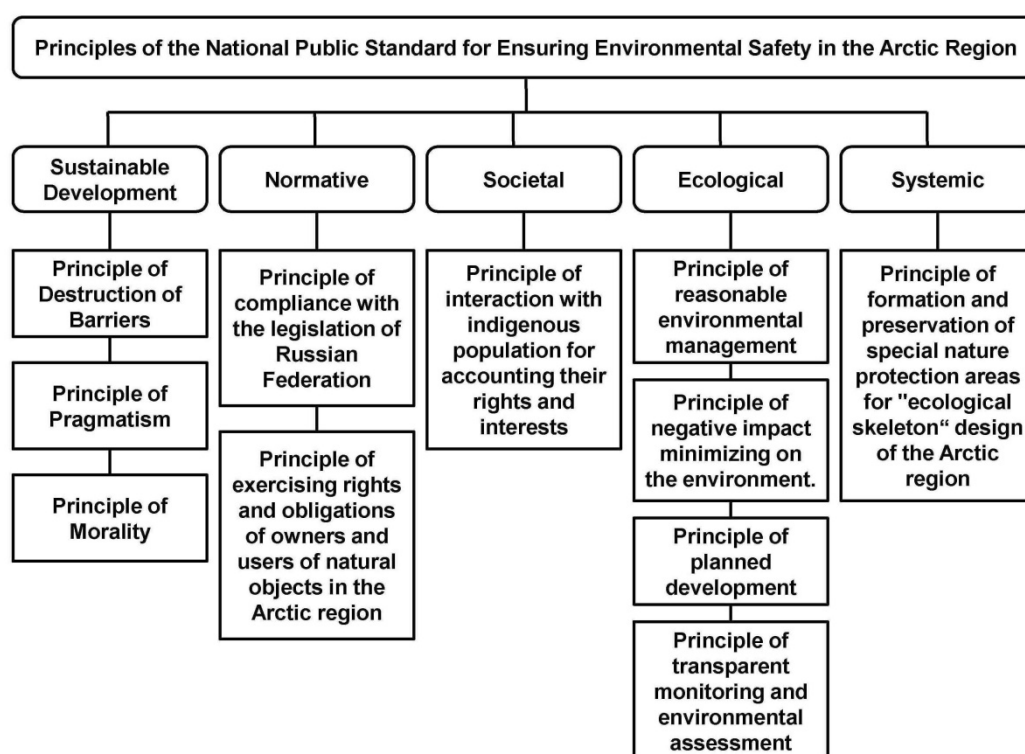


Fig. 1. General and special principles of NPSESA

The principle of transparent monitoring (section 4.8 of NPSESA) is relevant to the Global Reporting Initiative, GRI [11]. That requires more completely and regularly studying the impact of enterprise activities on the environment and local communities. The “Stakeholder Engagement Guide” introduced by the International Finance Corporation (IFC) has at large something in common with NPSESA certain criteria of which need consultations with local communities and accounting their opinions on a wide range of issues.

NPSESA regulates in detail the rules and principles for enterprises activity in the Arctic region. The systemic design principle of NPSESA does not differ up to much from existing international foreign standards (e.g. ISO 14001 “Environmental Management Systems”, ISO 18001 “Occupational Health and Safety Assessment Series”, etc.) which are voluntarily adopted by enterprises abroad. For the most part reporting is compiled on the data that are collected in accordance with the already existing requirements by acting and engaged organizations.

The most costly measures possible could be required for implementation of the “Transparent monitoring and environment impact assessment principle” (section 4.8 of NPSESA). However, since the NPSESA encloses the “Transparency principle” (section 5.3 of NPSESA) and involves updating procedure of the NPSESA statements, this obstacle can be removed. Thus, models and ways of interaction between various enterprises, public authorities and the population can be found which will provide reduction in value the fulfilling of this principle. Undoubtedly, the application will require additional organizational and educational arrangements.

Within NPSESA development, the scientific community should play the part of the key experts, all changes in the NPSESA should be scientifically grounded and built on the practice of regular monitoring of the NPSESA performance as a practical activity control. Scientific approach shall include the following processes:

- 1) ecological forecasting of environmental quality and its change under specific environmental policy impact;
- 2) scientifically grounded environmental planning, i.e. a strategy and detailed programs for environment protection and rational use of natural resources;
- 3) developing scientifically grounded methods for environmental economics control through law;
- 4) monitoring, development and standardization of environmental control approaches, keeping record of natural resources availability, quality and use;
- 5) expert services in environmental control in order to establish environment compliance and non-compliance with the applicable legal requirements;

6) providing environmental education, promoting environmental awareness and social in order to change the idea of consumption.

Ideological foundations of NPSESA

The key statements underlying foundations of the developed standard according to [9] are following:

- establishment and formalization of the clear and pliable environment-friendly rules of conduct for economic entities allocated and acting in the Arctic region;
- selection and composition of the metrics for environment-friendly rules of conduct analysis and assessment which assign guidelines to existing and incipient enterprises in the Arctic region;
- availability and application of the unified code of efficient practices and initiatives used by research, public and business entities and which are relevant to the current situation in the Arctic region;
- adherence and execution of the domestic and international norms and requirements in the Arctic region established in the field of environment protection and control;
- development of the novel institution to voluntary adoption of the environment-friendly rules of conduct for the all acting and incipient business entities in the Russian Arctic.

The NPSESA fundamentals composition is shown in Fig. 2.

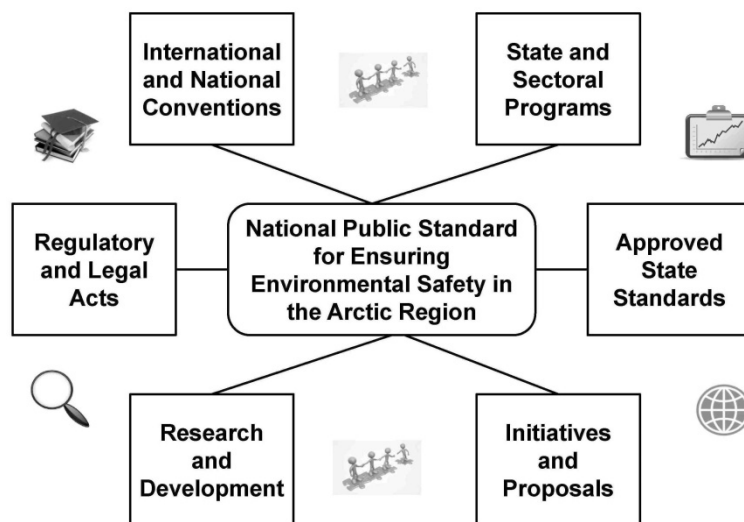


Fig. 2. Methodological and practical base of the NPSESA

The Arctic region of Russia with marine economic zone and continental shelf occupies 30% of the country's territory. Arctic region provides 12-15% of GDP of the Russia and about a quarter of export. 43% of Arctic region of the planet comes from Russian sector. This is nearly 9 million square kilometers. Over 2,5 million people are living here, which is 2% of the country's population and about 40% population of the Arctic.

Nowadays there are several groups of interests inherent to both governments and large companies operating in Arctic Region.

The group of economic interests is defined by:

- 1) High capacity hydrocarbon deposits that are technologically available now and capable of fulfilling the world's economy needs for a hundred years ahead on the proven reserves alone.
- 2) Potential hydrocarbon future deposits – methane hydrates not available at the moment due to the high cost of mining and processing, what makes the final product economically uncompetitive. However, in case of conventional reserves exhaustion and hydrocarbons cost growth, methane hydrates will be competitive even with modern technologies use.
- 3) Continental deposits of metallic and non-metallic fossils, which technological availability increases with the exhaustion of analogues in other climatic zones, changes in mining methods and climate change. Moreover, Arctic Region includes open mineral supplies that can now be considered as alternative raw material for nonferrous metals, alloys, new ceramic material.
- 4) Large stocks of freshwater.
- 5) Power generation from renewable sources – wind energy, tide energy, ocean biomass.

6) Traditional international zones of fishing recourses, as new marine bioresources, emerging on the market due to, first of all, decreasing of traditional recourses, and, secondly, development of the refining technologies of the nontraditional raw material which result in high quality protein products.

7) Possibility of the new safe transport schemes, such as “Northern Sea Route” which relevance is defined not only by reducing delivery distance from Asia to Europe, but also by safety in terms of piracy and terrorism, unlike Southern transport schemes, as well as by remoteness from dangerous areas in terms of military conflicts.

However, these economic advantages are partly leveled out by:

- climatic conditions;
- natural systems vulnerability;
- insufficient knowledge in functioning features of the Arctic natural resources in environment as well as global and regional climate change conditions;
- logistic risks, generally represented by the late delivery due to ice situation, low temperatures that prove dangerous for some goods;
- risks of the ice-related emergencies that demand special requirements to the constructions of ships, or to wiring;
- long distances between emergency and rescue centers, that results in extra costs for ship and cargo insurance.

Nevertheless, all these risks can be substantially reduced during the development of emergency and rescue infrastructure, ship wiring and storage technologies.

The group of military-strategic interests includes:

- 1) Protection of the social and economic interests during the mining of hydrocarbon resources and raw materials.
- 2) Protection of the national fishing vessels on the free territories for international fishing in Arctic region.
- 3) Protection of the territorial waters and marine territories from poaching and unauthorized access across 200 miles of Russian Arctic zone.
- 4) Deployment of strategic missiles as well as air defense and anti-submarine warfare components in Arctic region and on sea-based facilities as most desirable solution both in terms of approach time and secrecy.
- 5) Arranging logistically fast transfer of equipment and manpower through the country’s territory.
- 6) Deployment of non-nuclear defense equipment and rapid reaction force.

Ecological interests primarily arise from the fact that Arctic region is Northern hemisphere’s pollution collector. Global water and atmosphere transition of pollution from low latitudes in the context of climate change leads to the collection of polluting substances in different components of Arctic region environment and to reduce in its resilience to external shocks. Which, in turn, leads to exhaustion of biological resources, ecosystems sustainability on different levels, deterioration of the environment quality and to considerable constraints to ensuring the quality of life within Arctic native peoples, or the population engaged in natural resource extraction in Arctic region, and ultimately – reduce in the efficiency of economic activities. Moreover, development of knowledge in Arctic ecology gives extra possibilities for protection of national interests in international courts, during cases when both countries and companies are charged with inflection of environmental harm.

Ecological factors specific to Arctic region of Russia are:

- global climate changes decreasing Arctic ecosystems’ sustainability to external impacts;
- global and regional atmosphere pollution, resulting in global transition of major pollution “waves” to the Arctic;
- decrease in snow cover albedo;
- vulnerability of the Arctic environmental complexes and its dependence on global environmental changes;
- natural and technological transformation of geochemical background and a break in natural chemical elements biogeochemical cycles;
- damage caused and accumulated impact as a result of economic or another activity which can lead to climate destabilization, geochemical, cryolithological and environmental processes across large distances of Northern hemisphere;

- low potential and speed of self-cleaning and remediation of environmental compartments, including degradation of natural waters, soils, natural vegetation cover, biota in general;
- anthropogenic and natural infestation of new biological species, which can significantly violate biological diversity and ecosystems sustainability in general;
- specific environmental conditions requiring special, more energyconsuming technologies;
- industrial negative impact on flora and fauna of Arctic Region excluding possible ecological adaptation to new conditions;
- high value of biological resources and freshwater resources, which are key strategic reserves of freshwater on the planet;
- non-integrated use of natural resources and utilization of industrial waste;
- leakage of the extracted hydrocarbons and other emissions.

In the modern world there has been a continuous increase in international interest in the Arctic which is reflected in following:

- increase in the number of interdisciplinary studies, including explorational, geophysical, hydrological, oceanological, climatic, biological, ecological;
- increase in the number of inter-State disagreements and applications to international authorities concerning the question of owning the disputed territories of maritime shelf;
- increase in economic interest from the countries without direct access to the Arctic and arguments over ocean status and the Arctic territories;
- global collaborative research of 63 countries within the bounds of international program “International Polar Year” held from March 1, 2007 to March 1 2009 (IPY 2007/08).

The main reason for the need of this standard is that the current regulatory framework does not and fundamentally cannot reflect all aspects of the environmental management issues in the Arctic region. This is not due to regulatory framework’s flaws, but due to a great number of aspects that cannot be embedded in the law. There is not always a need to strictly control the activities, to reduce risks of environmental disasters – it is often enough to be guided by certain principles and regulatory framework’s consistency.

Furthermore, new principles and new risks will arise followed by an increase in the intensive use of Arctic region. Regulatory framework is unable to respond quickly to such changes, in this case, the standard, that includes the basic principles of environmental management and environmental security, may at least ensure socially acceptable activities in Arctic region, if not fully replace the law.

In order to establish a set of standards for Arctic region of Russia activities we need to finalize and formalize principles of the rational and efficient use of natural resources in the Arctic on the national level, excluding "Southern" technologies direct transfer without regional adaptation and approbation. In addition, the industrial approach to natural resources use in Arctic region should be replaced, as obsolete at this stage of development, since at the current division of labour it is impossible to solve all the problems of environmental safety within one single industry, let alone within one single enterprise. Primarily standardization should relate to the existing regulatory framework, which does not correspond to the document "Basic Principles of Russian State Policy in the Arctic until 2035" (approved by President of Russian Federation Decree no. 164, March 5, 2020) [12].

Thus, the following regulatory framework issues are to be resolved as a part of standardization process:

- multiplicity and narrowness of regulations, standards governing environmental issues of different trends, including ones that spread to Arctic region of the Russian Federation, but do not take into account its natural features;
- lack of accounting of international organizations’ environment protection initiatives in many industrial acts;
- lack of a mechanism for generating new knowledge about the structural and functional organization of the Arctic ecosystems, sustainability mechanisms and for integrating them into the existing legal acts, which have a regulatory nature for certain types of activities;
- lack of requirements on regional adaptation and extraction technologies testing and natural resources processing in Arctic region;
- lack of accounting mechanism for significant differences across Russian Arctic in all its extremely high diversity of landscapes and climatic conditions;

- lack of national basic documents as the basis for the formation of a highly specialized, sectoral regulations which have a territorial binding for the industries involved in the use of natural resources, and form their own regulatory framework;
- assessment approaches for allowable anthropogenic impact and Arctic ecosystems load are not developed;
- environmental impact expertise and assessment does not cover all proposed economic projects in Arctic region of Russia;
- special climatic conditions is not considered as a part of technical regulations for products that can be produced or consumed in Arctic region of Russia.

Based on the foregoing, the NPSESA shall exclude narrow or industrial approach, become the basic document for regional regulations as well as consider separate enterprise as an object of standardization.

National nature of the NPSESA is reflected in the fact that it is designed for independent territories of the Russian Arctic, taking into account the Russian legislation. In terms of functionality the NPSESA is a continuation of such documents as "Basic Principles of Russian State Policy the Arctic Region before 2020 and beyond" (approved by President of Russian Federation Order no. 1969, September 18, 2008) [13], "Russian Ecological Doctrine" (approved by President of Russian Federation Decree no. 1225, August 31, 2002) [14], "Russian Maritime Doctrine until 2020" (approved by President of Russian Federation Decree July 27, 2001) [15]. National nature of the NPSESA does not exclude adherence to standard of a foreign organizations working in the Russian Arctic.

The public nature of the NPSESA is expressed, first and foremost, in the idea of voluntariness, i.e., the NPSESA is not binding, however, organizations that accept the NPSESA, commit themselves to implement its criteria voluntarily, aware of the importance of preserving the integrity of the environment, compliance with safety standards and responsibility for the quality of life of future generations. Organization can independently check its conformity with the NPSESA and declare the acceptance of the NPSESA, using information in the Section 4 of NPSESA [9]. However, the functioning of the NPSESA as a system implies the creation of expert council, which will verify whether the activities of an organization comply with the NPSESA. Expert council shall be an elected body and consist of representatives of organizations that have already adopted the NPSESA, as well as academics and government officials. The expert council membership, size and authority are to be defined at the first meeting of its representatives willing to adopt the NPSESA.

Future challenges for development of natural resources of Arctic region and providing its environmental security are determined by the set of objectives specified in the document named "Basic Principles of Russian State Policy in the Arctic until 2035" [12]. The objectives include:

- implementation of competitive advantages of Russia in production and transportation of energy resources;
- structural adjustment of economy in the Arctic region of Russia on the basis of development of mineral and raw materials base and water biological resources in the region;
- upgrading of economic efficiency of using the mineral and raw material base and water biological resources of Arctic region through integrated approach and considering their natural characteristics;
- establishment and development of the North Sea Route infrastructure and communication administration system to meet any challenges of the Eurasian transit;
- completion of a unified information space of the Arctic region of Russian Federation;
- transformation of the Arctic region of Russia into the leading strategic resource base of the Russian Federation;
- adequate response to global environment and climate changes.

The basic approach to NPSESA implementation is its voluntary adoption. However, the incentive measures are possible that can be adopted at the regional level inclusive Arctic territories. Such measures could be participation terms for in contest to regional government procurement provision of goods and services. In addition, large-scale enterprises that have joined and adopted the NPSESA will involve their contractors and suppliers in similar actions. It is intended that during the five or seven years functioning under the NPSESA and applying it in day-to-day activity will become a strategic component of the enterprise corporate responsibility and culture.

One of the suitable means for NPSESA implementation in practice and its wide application would be the information system "An interactive map of environmental problems in the Barents Region" (<https://barentsmap.com/>) developed by Federal Research Center "Kola Science Center of the Russian

Academy of Sciences" under cooperation with the Project Office for Arctic Development, the metals and mining company "Nornickel" and the Faculty of Economics of Lomonosov Moscow State University. The system description and specific features are in detail discussed in studies [2, 4]. System functioning logic is based on the key principles and criteria of the NPSESA.

According to expert estimates, the system should provide situational awareness [3] enhancement in the field of environmental safety in the Arctic region and consistency of making managerial decisions in this area. That effect is obtained by general time reducing for relevant information acquisition, processing and analysis on the heterogeneous factors impact on the state of ecosystems in the Euro-Arctic region.

Conclusion

The Arctic region and its constituent territories are a strategically important area and object of the national economy and defensive power of Russia. Novel technological challenges and features for the development and exploration of traditional types of resources and new types of resources emergence as well as partially or completely depletion of resources at lower latitudes, especially biological resources, and the outlined accessibility for exploration of the previously unusable ocean area due to the constant ice cover in view of the global warming processes, in many respects caused a burst of activity among all the participants in development of the Arctic region. However, nowadays, there is no unified international document that would define any standards of activity ensuring environmental safety in the Arctic region. This significant fact plays not the last and may be key role of the growing global interest in the Russian Arctic.

Our country is an Arctic state with the largest area of the Arctic territories in the world. Therefore, according to many experts Russia should have a fundamental document of national nature that would define the standards for environmentally safe activities in the Arctic region. It is important, since there could not be any economic activity without environmental safety which is the basis for sustainable development of the country. At the same time, the existing regulatory framework does not reflect and, in principle, cannot reflect all aspects of nature management in the Arctic region. This is not due to regulatory framework is imperfect, but due to a great number of aspects that cannot be embedded in the law. There is not always a need to strictly control the activities. It is often enough to be guided by certain principles and regulatory framework's consistency to reduce risks of environmental disasters. The adoption of a unified environmental-friendly standard by the Arctic countries can become one of the most essential objectives of the Russian Federation activities in the upcoming period of its Chairmanship in the Arctic Council.

Primary standpoints and contributions of our study and generated guidelines to regional government and enterprise decision-makers on its basis are used under implementation of the «Strategy for Arctic region of Russian federation development and national security ensuring until 2035» (approved by President of Russian Federation Decree no. 645, October 26, 2020) [16] in Murmansk region within the development of information, analytical and normative support of the environmental safety in this region, which is strategically important for the Russian Arctic as a whole.

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Информация об авторах / Information about the authors

Андрей Владимирович Маслобоев

доктор технических наук, доцент,
ведущий научный сотрудник,
Институт информатики и математического
моделирования технологических процессов
Кольского научного центра Российской академии наук
(Россия, Апатиты, ул. Ферсмана, 24А)
E-mail: andrejmasloboev@mail.ru

Владимир Алексеевич Маслобоев

доктор технических наук, профессор,
главный научный сотрудник,
Институт проблем промышленной экологии Севера
Кольского научного центра Российской академии наук
(Россия, г. Апатиты, ул. Ферсмана, 14)
E-mail: v.masloboev@ksc.ru

Andrey V. Masloboev

Doctor of technical sciences, associate professor,
leading researcher,
Institute of Informatics and Mathematical Modelling
of Technological Processes of Kola Science Centre
of the Russian Academy of Sciences
(24A Fersmana street, Apatity, Russia)

Vladimir A. Masloboev

Doctor of technical sciences, professor, chief researcher,
Institute of North Industrial Ecology Problems
of Kola Science Centre of the Russian Academy of Sciences
(14 Fersmana street, Apatity, Russia)

Авторы заявляют об отсутствии конфликта интересов /

The authors declare no conflicts of interests.

Поступила в редакцию / Received 15.06.2021

Поступила после рецензирования / Revised 11.08.2021

Принята к публикации / Accepted 04.10.2021