

УПРАВЛІННЯ В НАФТОГАЗОВОМУ КОМПЛЕКСІ

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ENHANCING THE EFFICIENCY OF ENVIRONMENTAL AND ECONOMIC RISKS MANAGEMENT FOR OIL AND GAS PRODUCING ENTERPRISES IN AZERBAIJAN

Abstract. Apsheron region is the main oil producing region of Azerbaijan. One of the main problems that have risen here since the beginning of the exploitation of oil fields is the contamination of landscapes with oil and oil products. At present, a significant part of the land is heavily polluted with oil and formation water, the hydrological regime of the territory has deteriorated, and the soil structure has been destroyed.

The State Oil Company of the Azerbaijan Republic (SOCAR) is taking decisive steps in improving environmental safety management systems in accordance with international requirements, as well as in solving existing environmental problems, protecting public health and the rational use of natural resources. Prevention of pollution as a result of onshore oil and gas operations, elimination of the consequences of pollution is a priority task of SOCAR's environmental policy.

The analysis of the current state of environmental and economic risk management at SOCAR showed that, despite all the positive changes in the field of reducing environmental pollution, the company still needs to enhance the effectiveness of measures to manage these risks.

In particular, despite the successful implementation of a number of measures to reduce air pollution, the amount of air emissions from stationary sources at the company's enterprises remains significant.

A number of extremely important, environmentally oriented initiatives does not sufficiently cover the oil and gas production by onshore enterprises and are mainly focused on offshore enterprises, which are being developed independently and jointly with foreign companies.

In order to enhance the effectiveness of risk management, it is proposed a departure from a centralized, at the company level, form of management and the formation of a risk management system (RMS) directly at the enterprises themselves. To implement this approach, some changes in the organizational structure of enterprises are recommended, including the creation of a department for managing all risks to which the enterprise may be exposed. The creation of such a department directly in Oil and Gas Production Asset will allow more efficient use of the potential and real capabilities of the enterprise in the face of uncertainty and associated risks, the necessary optimization of the directions and methods of risk management, which are reflected in the risk minimization program, developed with the aim of ensuring the sustainable development of the enterprise.

Keywords: environmental and economic risk, oil and gas company, environmental pollution, economic damage, risk management system.

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ПІДВИЩЕННЯ ЕФЕКТИВНОСТІ УПРАВЛІННЯ ЕКОЛОГІЧНИМИ І ЕКОНОМІЧНИМИ РИЗИКАМИ НА ПІДПРИЄМСТВАХ, ЩО ВИРОБЛЯЮТЬ НАФТУ І ГАЗ В АЗЕРБАЙДЖАНІ

Анотація. Апшеронський регіон є основною нафтовидобувною областю Азербайджану. Однією з головних проблем, що зародилися тут з початку експлуатації нафтових родовищ, є забруднення ландшафтів нафтою і нафтопродуктами. В даний час значна частина земель сильно забруднена нафтою, пластовими стічними водами, погіршений гідрологічний режим території, зруйнована структура ґрунту.

Державна нафтова компанія Азербайджанської республіки (ДНКАР) приймає рішучі кроки в удосконаленні систем управління екологічною безпекою відповідно до міжнародних вимог, а також у вирішенні існуючих екологічних проблем, охорони здоров'я населення та раціональне використання природних ресурсів. Запобігання забрудненню в результаті нафтогазових операцій на морі і суші, усунення наслідків забрудненню є пріоритетним завданням екологічної політики ДНКАР.

Проведений аналіз поточного стану управління еколого-економічними ризиками ДНКАР показав, що, незважаючи на всі позитивні зрушення в сфері зменшення забруднення навколишнього середовища, в компанії все ще існує необхідність в підвищенні ефективності заходів з управління даними ризиками.

Зокрема, незважаючи на успішну реалізацію цілого ряду заходів щодо зменшення забруднення повітря, величина викидів в атмосферу від стаціонарних джерел по підприємствах компанії залишається все ще істотною.

Цілий ряд надзвичайно важливих, екологічно спрямованих ініціатив в недостатній мірі охоплює нгд підприємства суші і сфокусований, в основному, на підприємствах, що розробляють родовища моря, як самостійно, так і спільно з закордонними компаніями.

З метою підвищення ефективності управління ризиками, пропонується відхід від централізованої, на рівні компанії, форми управління і формування системи управління ризиками (СУР) безпосередньо на самих підприємствах. Для реалізації даного підходу рекомендовані деякі зміни в організаційній структурі підприємств, що включають створення відділу по управлінню всіма ризиками, яким може бути піддано підприємство. Створення такого відділу безпосередньо в НГВУ дозволить більш ефективно використання потенціалу і реальних можливостей підприємства в умовах невизначеності і пов'язаних з нею ризиків, проведення необхідної оптимізації напрямків і методів управління ризиками, які відображаються в програмі по мінімізації ризиків, розроблюваної з метою забезпечення сталого розвитку підприємства.

Ключові слова: еколого-економічний ризик, нафтегазодобивуюче підприємство, забруднення навколишнього середовища, економічні збитки, система управління ризиками.

Introduction. According to the statistical data published in 2018 by analysts at Wood Mackenzie, a global energy, chemicals, renewables, metals and mining research and consultancy group, 70% of total oil volume in the world was produced by old, mature fields. Since the current average oil recovery for mature fields varies between 30-35% at a relatively high ultimate recovery factor, there are quite large volumes of residual oil in the reserve of world companies, which can and should be developed. The analysts also focus readers' attention on the fact that the chances of discovery of new promising fields fall year by year noting that in 2018 the world companies discovered only 10% of the reserves that they had discovered since 1960. Therefore, recovery of residual reserves from mature fields by enhancing the efficiency of their development, will be a significant factor for maintaining a stable level of oil production in the world companies in the near future. Increasing attention to old fields by some companies already has allowed the oil reserves to grow almost one and a half times over the past 25 years.

Moreover, it turned out to be more profitable and efficient than the planning and execution of an expensive exploration activity for discovery of new fields [1].

Azerbaijan, thanks to its centuries-old oil history, has made a huge practical contribution to the development of the world oil and gas industry. Unfortunately, Azerbaijan, which has been known for its oil wealth since the middle ages, has never been its rightful owner, but has also been on the verge of an environmental disaster [2]. At the times of tsarist Russia the lack of technologies for wells start-up, the absence of sealed systems at the surface for collecting of oil and gas led to the fact that as a result of a powerful open flow of wells and zero sandface back pressure, oil escaping from the wells flowed through the territory of fields, releasing associated gas into the atmosphere. The penetration of gas-bearing reservoirs led to even more powerful open flow of wells, which lasted for weeks, polluting the atmosphere with a huge number of chemical components contained in the gas [3].

Thus, more than a century of development of Azerbaijan's oil fields has led to large-scale contamination of the surrounding landscape with oil and petroleum products. Huge areas of oil fields were almost completely polluted with oil or flooded with produced oily water, hundreds of hectares of land were degraded, and the level of radioactivity and gas contamination of oil-producing territories increased. The problem of pollution was, and still is, particularly acute in Apsheron peninsula, whose territory is around 222 thousand hectares. The peninsula is the site of concentration of almost all old fields, the share of oil fields accounts for 30 thousand hectares, or 13.5 % of the entire territory [4]. The remaining recoverable oil reserves of the old fields are still significant, and therefore the state and foreign companies have quite serious plans for their further development [5]. In this regard, the problem of assessing the possible technogenic impact and managing environmental risks for the old fields of Azerbaijan, in order to improve the environmental safety of the territory where these fields are located, is becoming more and more urgent.

The object of this study is the environmental risks that can occur during development of onshore fields of Azerbaijan, the realization of which can exacerbate the negative processes of environmental quality changes, as well as reduce the profitability of Oil and Gas Production Assets (OGPAs) – the enterprises that develop the fields.

The purpose of the study is to analyze the environmental and economic risk management activities carried out at the oil and gas producing enterprises of the State Oil Company of the Azerbaijan Republic (SOCAR), and provide recommendations on further enhancement of the effectiveness of managing those risks.

Theoretical and methodological background. The information basis of the research consists of scientific monographs and articles on assessment and management of risks, in general, and environmental risks, in particular.

The concept of any risk, as noted in [6], includes two elements - assessment and management. The risk assessment is a scientific analysis of the nature and scale of the risk in a specific situation, while the risk management is the analysis of the risk situation and development of a solution aimed at minimizing the risk.

The risk management process is a complex and multi-level procedure. However, as noted by a number of researchers, it can be divided into a number of stages in accordance with the specifics of conducted actions for risk management. In particular, the author [7] considers the process of the risk management in the oil and gas industry in the form of the following sequence of actions: a) risk analysis (identification and assessment of a risk); b) selection of methods for influencing on the risk based on comparison of their effectiveness; c) making a managerial or other decisions; d) impact on the risk; e) control of the obtained results.

Environmental risk is defined by the author of research [8] as the probability of obtaining certain damage as a result of the manifestation of an environmental hazard factor in relation to a specific object of assessment. Environmental damage is considered as a cost expression of the harm caused to the environment or its individual components by the manifestation of natural and, or anthropogenic factors of environmental hazard over a certain period of time.

Environmental damage to the oil industry, as noted in [9], is expressed through reduced well production rates, oil spills, increased equipment wear, etc. Economic damage associated with environmental degradation is the cost expression of all negative impacts of enterprises on the environment. The latter two categories can be considered together with the environmental costs of production, which are reflected in financial costs and are spent both on repairing the damage and on preventing it in the future.

Environmental and economic risks are defined in [10] as a probability of reducing production efficiency under the influence of anthropogenic and technogenic loads on the territory. So, the deterioration of the environment due to the violation of the established norms, requires additional expenses on measures to eliminate them (risk management) by enterprise management; the growth in production requires an increased consumption of natural resources; the occurrence of an adverse event may cause the violation of financial obligations of the enterprise to partners, lenders etc. Environmental and economic risks are located at the intersection of three areas: environmental, economic and social.

Risk management becomes an integral part of the strategic and operational management of successfully developing enterprises, as noted in [11]. From the concept of “risk measurement”, which implies the development of a model for assessing the value of a particular risk, enterprises tend to move to “risk management” – the development of a management strategy for influencing risks depending on their estimated value. Such a system approach to managing all risks in the enterprise leads to an increase in the effectiveness of risk management and contributes to the growth of production efficiency. The authors [12] note that enterprises that implement a risk management system (RMS) in the process of business planning and evaluation of performance effectiveness, as a rule, achieve strategic and operational goals faster. According to the authors, the introduction of RMS as a key aspect of doing business can transform the perception of enterprises about the relationship between risk and value creation.

The above approach, namely the formation of RMS, is proposed by the authors of this study to improve the mechanisms and methods of managing environmental and economic risks at OGP enterprises of the Apsheron peninsula of Azerbaijan.

The statement of the main material of the research. Currently, a significant part of the land of the Apsheron region is heavily polluted with oil and produced water, the hydrological regime of the territory has deteriorated, and the soil structure has been destroyed. According to various sources, from 20 to 33 thousand hectares of land were contaminated with oil and petroleum products during the development of fields on Apsheron. The total content of petroleum products in the soils of the peninsula is currently 9.3 million tons. Oil pollution is widespread locally, in the form of spots of 0.3-0.5 ha. The most unfavorable territories are the areas where “Bibiheybatneft” OGPA and OGPA named after H. Z. Tagiyev are located [4].

The water extracted with oil is partially injected back into the oil-bearing horizons for maintaining reservoir pressure, but some of it accumulates in ponds, tanks, and deep terrain areas on the territory of oil fields. Water extraction is often accompanied by an increase of the background radiation, which, in some cases, can be very significant [13]. Joint storage of drilling and reservoir water with oil in sedimentation tanks led to an increase in the level of ground water, salinization of soils and, as a result, to the death of almond orchards, vineyards and arable land [14].

SOCAR is taking decisive steps to improve environmental safety management systems in accordance with international requirements. Prevention of pollution and elimination of the consequences of pollution from oil and gas operations both onshore and offshore are priority tasks of SOCAR's environmental policy [15]. Implementation of the environmental policy and management of environmental and economic risks is carried out by the company's Ecology Department and Departments of environmental protection, which are part of the structure of each OGPA under “Azneft” Production Union (PU).

In order to ensure environmental safety and implement operational control during oil and gas operations, the company conducts systematic monitoring twice a year at all OGPAs. In 2018

the number environmental monitoring conducted for all the company's enterprises was 1005. The collected monitoring materials are sent to the integrated research laboratory of the company's Ecology Department for analysis. Note that of the 23283 analyses conducted in 2018, more than 2000 were made for onshore OGPA's.

Since 2009, SOCAR has been operating an environmental database based on the ArcView software, which is supplemented with information obtained during monitoring. The availability of a database allows to quickly track trends in the environmental situation for individual monitoring sites, assess the environmental situation of territories, identify sources of pollution in a timely manner, and issue a forecast for the development of the environmental situation for the observed sites.

In accordance with the results of monitoring, proposals for solving environmental problems are prepared, and projects for managing environmental risks are developed. For example, in 2018, more than 300 proposals were issued for improving the environmental situation and managing risks at oil production facilities, most of which were related to replacing of outdated wellhead equipment and in-field discharge lines that could create a potential risk of oil spills and gas emissions to the atmosphere; using a closed system for disposal of produced water and liquids used during wells intervention and workover, and others.

Since 2006, SOCAR has been implementing projects to clean up oil-contaminated land. As a result of environmental measures, more than 1,300 hectares of land were cleaned [15]. For example, over the past three years around 15 hectares of the territory, where the "Bibiheybatneft" OGPA is located, have been cleaned. However, taking into account that the total area of the OGPA territory is 817 ha, it becomes clear that the process of land reclamation for the enterprise is still far from complete.

SOCAR is implementing a strategy to reduce the impact on climate change by implementing a plan to reduce associated gas emissions to the atmosphere, developed jointly with the GGFR (Global partnership for reducing associated gas flaring) of the World Bank, which assumes the "Zero flaring of gas by 2030". In accordance with the plan, at the company's enterprises over the past decade new gas compressor stations have been put into operation and the compressor fleet has been updated for existing stations. Over the past five years the associated gas volumes of 280, 310 and 350 million m³ have been collected, respectively, from the offshore Oily Rocks and Guneshli fields (operated by SOCAR) and Chirag field (operated by BP) and transferred to the gas transportation system of Azerbaijan [16]. These and other measures allowed not only to reduce the volume of associated gas flaring and reduce environmental risks, but also undoubtedly made a positive contribution to the growth of economic indicators of the company and the Republic as a whole.

However, despite the successful implementation of a number of measures, the amount of emissions to the atmosphere from stationary sources (wellheads, compressors, storage tanks, flare pipes) are still significant for the company's enterprises. As can be seen from Figure 1 [17], the amount of emissions reduced by ~25% as a result of management activities during the period from 2010 to 2013, during the subsequent period up to 2018, remains approximately constant, at the level of 125.4 thousand tons, on average.

Environmental risks, associated with the emission of polluting substances into the atmosphere, accompany the activities of all oil and gas production assets of "Azneft" PU. The most common are releases of low-pressure annular gas to the atmosphere at wellheads; combustion of associated gas, excess amounts of hydrocarbons during the wells' start-up at terminals flare. Note, that in 2017 and 2018, about 1.7 million m³ of associated gas were burned at the flares of PU enterprises [18].

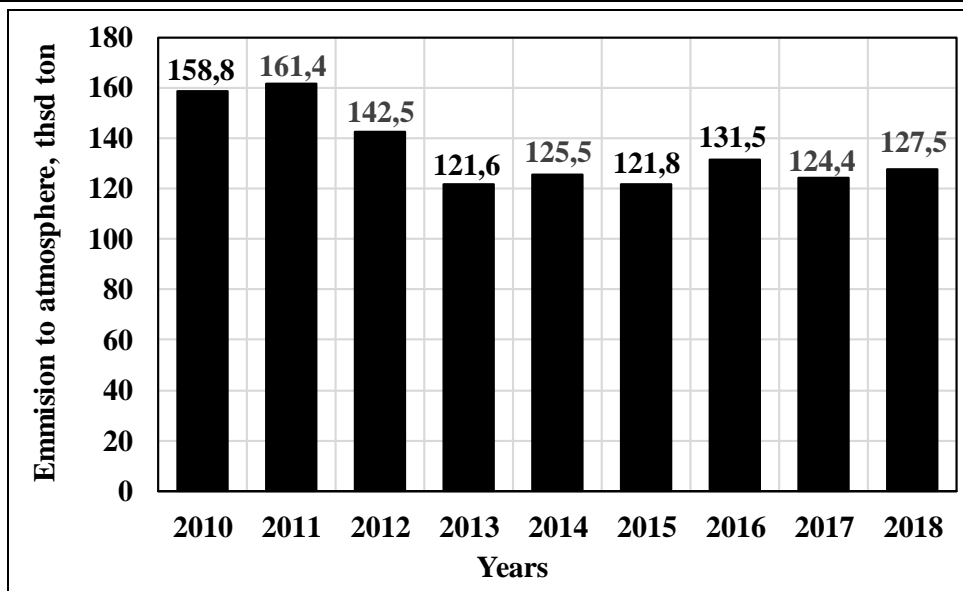


Fig. 1. Emissions to the atmosphere from SOCAR stationary sources

Source: SOCAR Annual Report: 2018 [17]

The activities of enterprises negatively affect the process of climate change as a result of the release of "greenhouse gases" such as methane and carbon dioxide into the atmosphere. As can be seen from Table 1, despite the activities carried out over the past decade, the amount of these emissions over the past three years has remained virtually unchanged and is still significant.

Table 1

Emissions of “greenhouse gases” to the atmosphere by SOCAR in Azerbaijan

“Greenhouse gas”	Years		
	2016	2017	2018
Methane (CH_4), thousand tons	127,7	126,7	130,9
Carbon dioxide (CO_2), thousand tons	3307,6	3231,2	3220,3
Total, thousand tons	3435,3	3357,9	3351,2

Source: SOCAR Annual Sustainable Development Report: 2018 [18]

NO_x emissions generated by gas flaring and electric power generation turbines are insignificant, due to the low content of nitrogen oxides in the gas produced with Azerbaijani oil. However, these emissions can still cause serious environmental damage, falling in the form of “acid rain”.

Emissions of non-methane volatile organic hydrocarbons as a result of evaporation of crude oil during storage, reacting with NO_x , form ozone, high concentrations of which in the ground layer can harm health, vegetation, and equipment.

The environmental factor always negatively affects the profit of companies and enterprises. Environmental restrictions determine the appearance of financial flows, such as fees for the use of natural resources, payments for environmental pollution, environmental fines, environmental protection costs, and the cost of implementing resource-saving technologies. In this regard, environmental risks associated with environmental pollution by enterprises become environmental and economic risks for them.

According to article 79 of the law [19], enterprises that “caused damage to the environment must, in accordance with current legislation, compensate for the damage caused in the amount of

actual expenses necessary to restore the disturbed state of the environment, taking into account losses”. At the same time, damage is understood as actual or possible losses resulting from any events or phenomena, in particular, negative changes in the natural environment due to anthropogenic impact.

The quantitative assessment of losses from pollution, presented in monetary terms, determines the economic damage to the environment. Practice shows [20] that economic damage should be calculated separately for the main elements of the natural environment - air, water bodies, land resources - due to the characteristics of these natural components. The modern system of payments for environmental pollution by enterprises is based on the calculation of economic damage using the method of generalized indirect estimates. According to a simplified interpretation of this method, the total economic damage (D_e) to the environment caused by man-made pollution is defined as a sum of damages caused by pollution of atmosphere (D_a), waters (D_w), soils (D_s), that is

$$D_e = D_a + D_w + D_s \quad (1)$$

The calculation of economic damage for individual components of the environment-the atmosphere, water and soil - can be made using the formula

$$D_e = \sum P_i M_i K_e \quad (2)$$

where D_e — economic damage from environmental pollution, thousand \$ / year; P_i — standard of payment for environmental pollution, \$/T; M_i — mass of the pollutant released into the environment by its individual components, ton; K_e — coefficient of the ecological situation and ecological

significance of the region.

Determine the possible economic damage caused to the atmospheric air from the emission of pollutants for an average OGP enterprise of onshore Azerbaijan.

From the expression (2)

$$D_e = D_a = (P_s M_s + P_{l.g.} M_{l.g.}) \times K_e \quad (3),$$

where P_s and $P_{l.g.}$ – the standard of payment by the enterprise for the release of solid and liquid and gaseous particles, respectively;

M_s и $M_{l.g.}$ – the mass of released solid, liquid and gaseous particles, respectively;

$K_e = 2$ - coefficient of ecological situation and significance of the Apsheron Peninsula.

Using expression (3) and data from table 2, for an average OGPA we will get:

$$D_a = (10 \times 30 + 5,8 \times 16000) \times 2 = (300 + 92800) \times 2 = 186200 \text{ \$/year}$$

Table 2

Emissions of pollutants to the atmosphere for an average OGPA in 2018

Pollutants	Emission mass, t / year	Standard fee, \$ / t
Solid particles	30	10
Liquid and gaseous particles (nitrogen oxide, non-methane hydrocarbons, etc.)	16000	5,8

Given that there are eight OGPAs subordinated to “Azneft” PU, this figure increases about 8 times, and the annual economic damage from air pollution alone for the UA will be about 1.5 million US dollars.

Thus, despite all the positive developments in the field of pollution reduction in SOCAR, there is still a need to enhance the effectiveness of environmental and economic risks management measures.

It should be noted that in the conditions of a market economy, which is the main engine for the development of economic relations in the Republic at the moment, there is an administrative form of management for all OGPA. These enterprises are characterized by the absence of economic freedoms, and they are completely dependent on the PU. Enterprises do not have the

freedom to sell their products or any other type of economic activity. Undoubtedly, this affects the interest of OGPA employees in the final product of production, and also slows down the implementation of incentive measures when evaluating the work of employees by the management of enterprises. This also affects the effectiveness of risk management measures.

According to article 27 of the law [21] “production control in the field of environmental protection and management is carried out by the environmental service of the enterprise, organization and institution”. In this regard, the Department of environmental protection plays an important role in assessing the environmental and economic risks of OGPA and finding methods for their management. Relatively new in comparison with other divisions of the enterprise, this Department was created in all OGPA of “Azneft” PU as part of the “Plan of comprehensive measures to improve the environmental situation in the Azerbaijan Republic for 2006-2010”. The work of the Department is closely linked to the Ecology Department of SOCAR and is sufficiently effective in implementing of measures aimed at improving the environmental situation in the fields recommended by the Ecology Department.

Based on the above analysis, we can conclude that the state of environmental and economic risks management at OGP enterprises does not fully meet the requirements of the current time. Note that this applies to the management of all risks that may be exposed to an enterprise engaged in the exploitation of old fields and involved in the development of projects on promising oil and gas horizons planned for drilling and production in the near future. Currently, this function belongs to the SOCAR risk management Committee, which is responsible for defining, managing, certifying and approving the risk map. However, risk management for highly productive offshore fields prevails in the activities of the Committee, and insufficient attention is paid to old, high water-cut and relatively low production rate fields.

Enhancing the effectiveness of risk management, in our opinion, can be achieved by eliminating the centralized approach to risk management, and creating a risk management system (RMS) directly at the enterprises themselves. The proposed measures for the formation of RMS for “Azneft” enterprises are described below.

The ISO 31000:2018 Risk management – Principles and guidelines by the International organization for standardization, and the project risk management methodology proposed by the standard of the American Institute of project management RMBOK were used as the basis for the formation of RMS at OGP enterprises.

The main goal of the set of measures to enhance the management of environmental and economic risks for OGPA is to form and integrate the RMS into the process field of enterprises [12]. As a result of the implementation of the proposed changes, the RMS should become the basis for making management decisions and an indicator of strengthening of risk control at the level of all OGPA divisions.

In the theory and practice of risk management, the following main approaches to risk management are distinguished: situational, process-centric, and complex (integrated, system) [22]. For the OGPA oil production process, the most interesting is the complex approach with the emphasis on internal risk management. It is proposed to leave the management of external risks in the area of responsibility of the SOCAR risk management Committee. The complex approach to the risk management is characterized as a continuous process that covers all areas of the enterprise's activities, involving employees at various levels of the management. This approach allows the enterprise to achieve its strategic goals and assumes the unity of the RMS and the overall management of the enterprise.

A complex RMS for OGPA should be based on the following principles, which will ensure the effectiveness of risk management at the enterprise:

- a single risk management center, i.e. the formation of a structural unit responsible for the risk management at the level of the entire enterprise;
- the RMS should be integrated into the existing enterprise management system, not duplicating existing management systems, but being their complement;
- risk management should be a continuous process;

- the results of the RMS should be taken into account when making management decisions;
- subjects of complex RMS at their level are responsible for analysis (identification and assessment) and continuous monitoring of risks, development and implementation of necessary measures for risk management and controls;
- the principle of methodological unity: risk management is carried out on the basis of standards, norms, methods and rules that are common to all participants in the process;
- optimality principle: the cost of maintaining the risk management system should not exceed the possible negative damage;
- when considering risks, the RMS should take into account the specifics of the time stage at which the field is being developed.

It is proposed to start the formation of the RMS for OGPA by making changes to the organizational structure of enterprises and creating a division whose main task will be to assess the risks and proposed changes for the entire enterprise. Based on the organizational structure of all OGPA, it is most appropriate to create a risk management Department that is directly subordinate to the head of the OGPA. This will undoubtedly require the introduction of additional staff units, the need for which is shown in Table 3.

Table 3

Additional staff units for creating a risk management Department

Name of the staff unit	Number of staff units
Head or Manager of the risk management Department	1
Chief specialist of the risk management Department	2
Leading specialist of the risk management Department	1

This Department will be responsible for identifying and assessing risks, developing a strategy and risk management tactics, which will be assigned such tasks as developing a risk control methodology, determining the level of acceptable risk, establishing ways to minimize risk and constantly monitoring the costs of their implementation.

The main advantage of RMS is an increase in the share of own funds in the enterprise's capital structure. The more risks there are, the more reliable the risk absorber should be, i.e. the greater the share of the enterprise's own funds and the more effective the risk instruments should be. A complex RMS will allow manipulating of all types of OGPA risks.

In conclusion, we note that the effectiveness of the Department will be determined by how much it closely communicates with other divisions of OGPA, representing various areas of the enterprise's production process. Thus, the effectiveness of work in the field of environmental and economic risk management will depend on the extent to which employees of that new Department actively and closely work with the Department of environmental protection of OGPA at the stages of identification and assessment of environmental risks, their prioritization by hazard level, in making decisions on the selected measures to eliminate environmental risk. The role of the Department is not to duplicate the responsibilities of the existing Department of environmental protection, but to integrate the environmental and economic risks into the list of all existing risks to which the OGPA may be exposed, and to make decisions on budgeting of the management activities for those that are most dangerous for the effective functioning of the OGPA.

Conclusions from the study. The analysis of the current state of environmental and economic risk management for SOCAR showed that, despite all the positive developments in reducing environmental pollution, the company still needs to enhance the effectiveness of measures to manage these risks.

In particular, despite the successful implementation of a number of measures to reduce air pollution, the amount of air emissions from the stationary sources at the company's enterprises remains significant. It is shown that the annual economic damage from air pollution alone, in general for Azneft, is about 1.5 million US dollars.

A number of extremely important, environmentally oriented initiatives are not sufficiently cover onshore OGPA and mainly focus on offshore enterprises which are being developed independently and jointly with foreign companies. At the same time, even for these enterprises, the implemented measures still require further enhancement of their efficiency.

In order to enhance the effectiveness of risk management, it is proposed to move away from the centralized form of management at the company level and form a risk management system (RMS) directly at the enterprises themselves. To implement this approach, we recommend some changes in the organizational structure of enterprises, including the creation of a Department for managing all risks that may be exposed to the enterprise. The creation of such a Department directly in the OGPA will allow for more effective use of the potential and real capabilities of the enterprise in conditions of uncertainty and associated risks, the necessary optimization of the directions and methods of risk management, which are reflected in the risk minimization program, developed with the aim of ensuring the sustainable development of the enterprise.

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