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Modernization of Diagnostic Methods for Oil Transformers

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Key words and phrases: analysis; device; Fourier transform; harmonics; model.

Abstract. The aim of the paper is to improve the reliability of operation of power oil transformers by improving the method based on the analysis of parameters of transformer oil and diagnostics of oil transformers.

The main research tasks are modeling the operating modes and faults of transformers and investigate the relationship between operating modes, the technical state of a power oil transformer with the parameters obtained in the analysis of transformer oil.

The main tasks of diagnostics of transformer equipment are detecting damage and defects, assessing the functional health of the equipment, determining the possibility of extending the service life without carrying out repairs, determining the scope of repair work if necessary, assessing the remaining service life and making recommendations for extending the service life.

A lot of research has been carried out on the chromatographic method of analysis of dissolved gases; this is the determination of parameters to check the reliability of the results of chromatographic diagnostics and the development of a radial diagram image as an accessible form of visualization of the results of the technical state of power transformers.

However, the development of a radial diagram image based on the results of chromatographic diagnostics does not give an idea of the rate of growth of gases in oil; therefore, it does not give an idea of the dangerous development of a malfunction.

It is supposed to supplement the radar diagrams, which have shown themselves as a convenient tool for perceiving the results of the analysis of transformer oil by the CADG method with diagrams for the rate of rise of gases. The results obtained will make it possible to use the rate of growth of gases in oil to determine the degree of danger of a

developing defect.

Today, environmental pollution is a serious problem all over the world. Environmental and health advocates point to problems related to certain foods and the current food system that have caused a large ecological footprint on the planet. The issue of food has gone beyond focusing solely on food security to include the context of human well-being and the sustainability of our planet [1].

Consider the malfunctions of power oil transformers and methods for diagnosing power transformers. The use of diagnostic methods makes it possible to assess the condition of entire transformer parks, thereby allowing ranking transformers by condition, which leads to a decrease in operating and repair costs.

We have created a model of operating modes and faults of transformers. The model will reveal the presence of regularities connecting the parameters of the harmonic components of currents and voltages with the parameters of the transformer.

Fig. 1 shows the forms of currents and voltages of the secondary winding of the transformer in a two-phase short circuit.

In [1–5] it is shown that efforts are needed to improve the method of chromatographic analysis of the composition of gases in oil in order to reduce the labor intensity and high cost of examining a transformer.

Based on the results of CADG, a radial diagram is constructed according to the rate of rise of gases. As can be seen from the studies [4–8], the resulting image of the radar diagram is a flexible diagnostic tool that allows you to both add the necessary parameters (rays) and remove parameters (rays) that are not involved in the analysis when considering specific problems, moving towards the goal.

Conclusion

For the purpose of improvement, it is proposed to supplement the radar diagrams, which

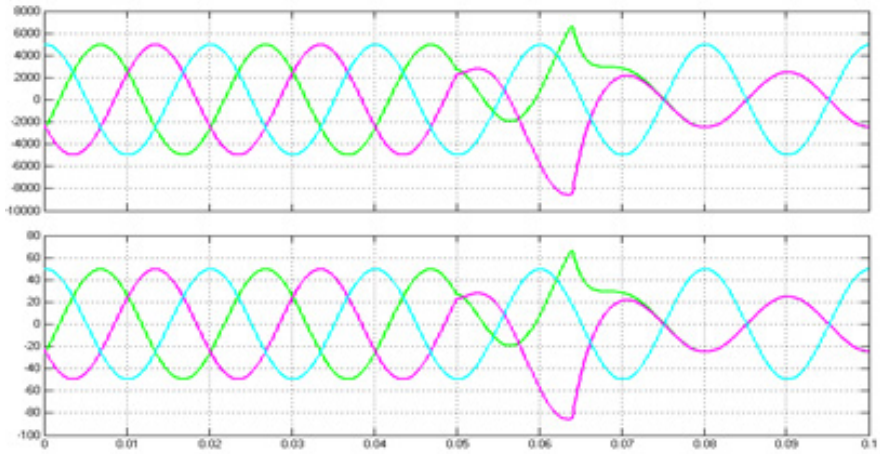

Fig. 1. Forms of currents and voltages of the secondary winding of the transformer in a two-phase short circuit

have shown themselves as a convenient tool for perceiving the results of the analysis of transformer oil by the CADG method with diagrams for the rate of rise of gases. The criterion for the rate of growth of gases in oil determines the degree of danger of a developing defect. The degree of danger of the development of a defect is established by the relative speed. If the rate of gas rise exceeds 10 % per month, then this indicates the presence of a rapidly developing defect.

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Модернизация методов диагностики масляных трансформаторов

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Ключевые слова и фразы: анализ; гармоники; модель; преобразование Фурье; устройство.

Аннотация. Целью работы является повышение надежности работы силовых масляных трансформаторов за счет совершенствования метода, основанного на анализе пара-

метров трансформаторного масла и диагностике масляных трансформаторов.

Основные задачи исследования:

– моделирование режимов работы и неисправностей трансформаторов;

– исследование взаимосвязи режимов работы, технического состояния силового масляного трансформатора с параметрами, полученными при анализе трансформаторного масла;

– разработка методики оценки степени опасности развивающегося дефекта силового масляного трансформатора по скорости подъема газов.

Основными задачами диагностики трансформаторного оборудования являются обнаружение повреждений и дефектов, оценка функционального состояния оборудования, определение возможности продления срока службы без проведения ремонта, определение объема ремонтных работ при необходимости, оценка оставшегося срока службы и рекомендации по продлению срока службы. По хроматографическому методу анализа растворенных газов проведено множество исследований: это определение параметров для проверки достоверности результатов хроматографической диагностики и разработка изображения радиальной диаграммы как доступной формы визуализации результата технического состояния силовых трансформаторов. Однако построение изображения радиальной диаграммы по результатам хроматографической диагностики не дает представления о скорости роста газов в масле, следовательно, не дает представления об опасном развитии неисправности. Предполагается дополнить радиолокационные диаграммы, зарекомендовавшие себя как удобный инструмент для восприятия результатов анализа трансформаторного масла методом CADG, диаграммами скорости подъема газов. Полученные результаты позволят использовать критерий скорости роста газов в масле для определения степени опасности развивающегося дефекта.

UDK 338

The Socio-Economic Effect of the Modern Olympic Games Heritage

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Key words and phrases: criteria (indicators) of the assessing of the contribution of the Olympic Games heritage; socio-economic effect of the Olympic Games heritage.

Abstract. The study aims to analyze the impact of the Olympic Games heritage to the socio-economic development of the territories where the modern Olympic Games were held and to create the assessment criteria (indicators) of this effect. The analysis was carried out with the use of statistical and analytical methods. It was found that in order to achieve the most effective positive results after holding the Olympic Games, host cities should plan the implementation of the heritage in the long-term perspective.

Introduction

Preparing, organizing and holding modern Olympic Games in our country and abroad proved how difficult and sometimes impossible it is to use fundamental sports and other infrastructure facilities rationally and cost-effectively in the future. It is also difficult to determine social changes in the territory where the Olympic Games were held, i.e., to analyze the socio-economic effects of the Olympic Games heritage.

Methodology

Much research has been done to assess the economic and social benefits of events such as the Olympic Games. The results are quite contradictory, and when the Olympic Games, as a rule, analytical work is practically not carried out, and obtaining reliable financial, statistical and other data is difficult.

Therefore, it is very difficult to assess the direct economic impact of the Olympics on the economy of the host country, but many researchers agree that the construction of new sports facilities (stadiums, ski slopes, swimming pools, etc.) is often unprofitable, since after the Olympic Games they often remain unclaimed. And states are forced to bear significant costs for their maintenance. But not only economic, but social effect is important, and it is often more positively expressed.

After the Olympics, experts consider two areas as long-term capitalization of the results obtained – this is the material or financial and economic heritage and the non-material heritage,

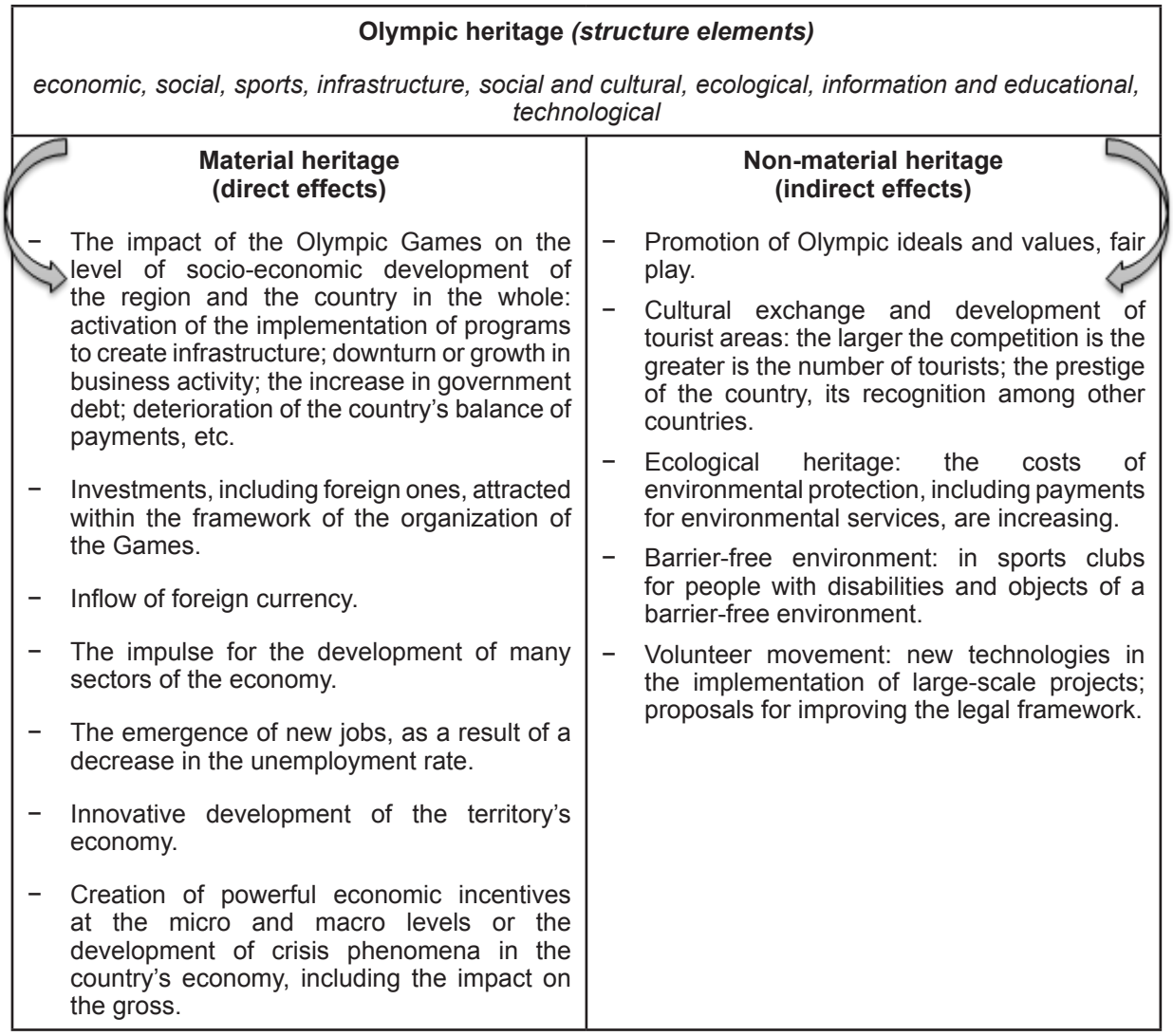

Fig. 1. The main elements of the structure of the Olympic heritage

which includes the promotion of Olympic ideals and values, fair play, the development of tourist zones, etc.

Fundamental scientific works on the economic and social effect of the Olympic heritage are presented by many authors – A.V. Varnaeva, K. Gratton, N.E. Zlokazova, D. Cashman, Z.M. Kuznetsova, B. Leopkey, J.A. Mangan, E.V. Markina, J. Matten, R.M. Nureyev H. Preuss, I.V. Pilipenko, H. Preuss, K. Tuhey, J.-L. Chapplet, L. Chalip and others.

In the attempt to systematize the segments of the Olympic heritage, we have compiled the structure based on the previously indicated approaches (Fig. 1).

Different scientists use a wide variety of methods for assessing the Olympic heritage, the differences between them are determined only in the choice of indicators, their further systematization, determination of effectiveness and generalization of results.

The Olympic Games are the most expensive sporting events in the world. About half of the Games are cost-beyond the planned budget. As it is shown in the Oxford Olympics Study 2016, on average, the amount for their implementation was $ 8.9 billion over the past 10 years. As a rule, the Summer Games are more expensive – their average cost is $ 5.2 billion, the

Table 1. Cost of holding the Olympic Games from 2000 to 2018

Year of holding	Venue	Cost of holding of the Olympic games	% from GNP per year of holding
2000	Sydney, Australia	4,2-6,6 billion of Australian dollars ($1,1 billion)	1.1
2002	Salt Lake City, USA	2,25 billion of dollars	0.0002
2004	Athens, Greece	15 billion of dollars	7
2006	Turin, Italy	4,36 billion of dollars	0.002
2008	Beijing, China	40 billion of dollars	0.3
2010	Vancouver, Canada	3,28 – official data, 6 billion of dollars – expert assessment	0.4
2012	London, Great Britain	9 billion pounds ($30 billion)	0.7
2014	Sochi, Russia	51 billion of dollars	0.03
2016	Rio de Janeiro, Brazil	4,6 billion of dollars	0.02
2018	Pyeongchang, China	12,6 billion of dollars	0.1

Table 2. Criteria (indicators) of the assessing of the contribution of the Olympic heritage to the social and economic development of territories

Social block	Economic block
− Unemployment rate. − The ratio of living wage and average per capita money income. − Number of registered crimes. − The level of criminality of the territory. − Volunteer movement. − Influence of sports and healthy lifestyle on the growth of popularity (the increase in the number of people involved in various sports)	− Surplus (+), deficit (–) of the budget of the considered territory. − Profit (loss) before taxation of the reporting year of enterprises in the considered territory. − Average monthly level of salary. − The volume of investments in fixed assets. − Price growth index and inflation rate, which determines the purchasing power of currency. − The level of income of the population

Winter Games – $ 3.1 billion. The most expensive Summer Games were held in London in 2012, and the most expensive Winter Games were in Sochi in 2014 (Table 1).

Our analysis made it possible to formulate criteria (indicators) for assessing the contribution of the Olympic heritage to the social and economic development of the territories where the modern Olympic Games were held (Table 2).

Conclusions

Summarizing the above, it should be noted that the following city (capital) of the Olympic Games, in fact, relies on the previous one, improved from one Olympics to another “economic, social and technical package”, which determines the perspective of the following heritage. This

package forms both the conditions necessary for the organization of sports and cultural events, and the forms of economic, social, infrastructural and other transformations.

Thus, in order to achieve the most effective positive results after the Olympic Games, host cities must plan the implementation of the heritage in long-term perspective.

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Экономико-социальный эффект наследия современных Олимпийских игр

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Ключевые слова и фразы: критерии (индикаторы) оценки вклада Олимпийского наследия; экономико-социальный эффект олимпийского наследия.

Аннотация. Целью исследования является анализ, который позволил сформировать критерии (индикаторы) оценки вклада Олимпийского наследия в экономическое и социальное развитие территорий, где проходили Олимпийские игры современности. Данный анализ осуществлялся с помощью статистического и аналитического методов. В результате исследования было выявлено, что для достижения максимально эффективных положительных результатов после проведения Игр принимающие города должны планировать реализацию наследия в долгосрочной перспективе.

UDK 337

The Essence and Significance of the Economic Potential of the Environmental Management Enterprise

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Key words and phrases: economic potential; economic potential management system; environmental management enterprise; domestic producers; free competition; market economy; socio-economic progress.

Abstract. In order to study the essence and significance of the economic potential of an environmental management enterprise in modern conditions, theoretical approaches to determining the economic potential of an enterprise were considered. Now the economic potential of the environmental management enterprise is becoming a crucial prerequisite for the socio-economic progress of the country. The methods of generalization and synthesis were used in the article. As a result of the research, it is revealed that the efficiency of using the economic potential of an enterprise largely depends on the success of the market transformation of the economy, the use of factors of free competition, the growth of the competitiveness of domestic producers in the domestic and foreign markets, the creation of a system of economic management of the economic potential of an environmental management enterprise corresponding to the real market economy.

The economic potential is the most important essential characteristic of the environmental management enterprise. In modern conditions, the economic potential becomes a decisive prerequisite for the socio-economic progress of the country and, in turn, depends on the success of the market transformation of the economy, the activation of stimulating factors of free competition, increasing the competitiveness of domestic producers in the domestic and foreign markets, creating a system of economic management of potential adequate to the market economy [1].

According to publicly available sources, in the process of studying the content of such a concept as “potential”, scientists and practitioners give an ambiguous interpretation of this concept. In addition, there is almost no definition of this concept in dictionaries, as a result of the impact of something on a certain object. Basically, the sources reveal various special cases of such a concept as “potential”. In economics, this concept is used in various aspects, for example, in order to evaluate capital investments, evaluate the implemented technological

Table 1. Matrix of options for assessing the potential of the organization of environmental management, depending on the objectives of the study

Nominator	Numerator		
	Needs (ensuring the enterprise operation in a break-even environment)	Goal (profit)	Result (effect)
Result	Satisfaction		
Needs		Expediency	
Goal			Efficiency
Costs			Profitability

processes and their improvement, evaluate the rationalization of production. For example, from the point of view of V.V. Korshunov [2], the potential is an improvement of one state in comparison with another state.

Almost all economic reference books disclose the content of such a concept as “economic potential”. Its content is mainly reduced to an assessment of the ratio of the final positive result to the costs of achieving it.

We can cite the following common definition of potential: it is identified with the productivity of using resources to achieve some goal [3].

Some authors identify the potential with the ability of the subject of market relations to perform work and achieve goals with the least expenditure of all types of resources [4, p. 181].

Some practitioners believe that potential as a category includes the following 3 parameters: efficiency, efficiency, productivity. Moreover, taking into account the specifics of the activity of the audited enterprise, only some of the above factors can be evaluated [5, p. 107].

Depending on the objectives of the study, it is possible to consider the potential as satisfaction of needs, expediency, efficiency or effectiveness of the organization’s functioning (Table 1) [6, p. 308].

From an economic point of view, the potential should be called a comparison of the results (including side and indirect) of the economic activity of the enterprise with the resources spent: natural, labor, material, with fixed assets [8, p. 3092].

The economic potential includes aspects of socio-economic and technical and economic efficiency, in other words, it reflects not only the level of use of the productive forces of society, but also the degree of achievement of the production goal [9, p. 512].

It is possible to present the essence of the economic potential in the form of a diagram (Fig. 1) [10, p. 361].

Summarizing the materials that reveal the content of such a concept as “potential”, it is possible to identify key approaches to determining the content of the potential of environmental management enterprises.

Within the framework of the first approach, individual scientists and practitioners understand the potential as the degree of achievement of the goals set by the enterprise. Moreover, managers recognize the fact that goals are dynamic, distinguish between operational and official goals of an economic entity.

In the second approach, scientists represent the potential of an organization as its (organization’s) ability to use the external one to extract rare resources from it that are necessary for its development.

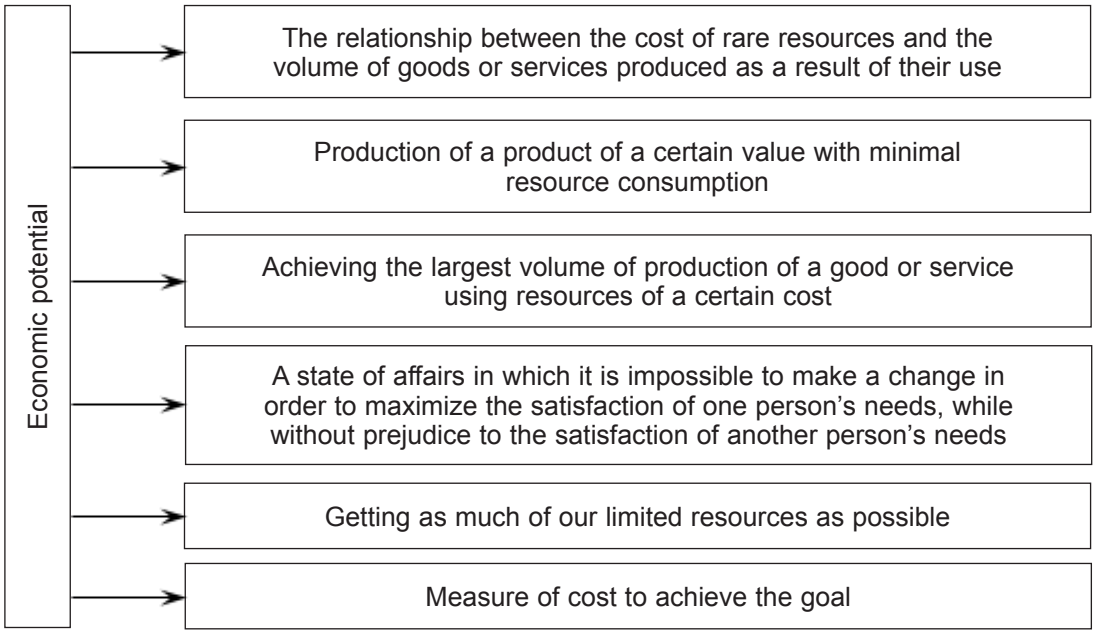

Fig. 1. Essence of the economic potential

In the third approach, the potential is characterized as a set of the subject's abilities to achieve the set goals (results) while minimizing costs. Moreover, the positive results indicated by the managers are achieved.

In the fourth approach, the potential is the level of customer satisfaction with the manufacturer, as well as its final product.

Thus, in the opinion of the authors, the basic component of the potential is to achieve the maximum result with a minimum of effort and costs. The essence of the problem of production potential growth is to increase the economic results for each of the units of funds spent in the process of using available resources.

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Сущность и значение экономического потенциала предприятия природопользования

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Ключевые слова и фразы: отечественные товаропроизводители; потенциал хозяйствования; предприятие природопользования; рыночная экономика; свободная конкуренция; система управления экономическим потенциалом; социально-экономический прогресс; экономический потенциал.

Аннотация. С целью изучения сущности и значения экономического потенциала предприятия природопользования в современных условиях были рассмотрены теоретические подходы к определению экономического потенциала предприятия. Сейчас потенциал хозяйствования предприятия природопользования становится решающей предпосылкой социально-экономического прогресса страны. В статье применялись методы обобщения и синтеза. В результате исследования выявлено, что эффективность использования экономического потенциала предприятия во многом зависит от успеха рыночной трансформации экономики, применения факторов свободной конкуренции, роста конкурентоспособности отечественных производителей на внутреннем и внешних рынках, создания системы хозяйственного управления экономическим потенциалом предприятия природопользования, соответствующей реальной рыночной экономике.

UDK 337

Financial and Economic Performance and the Level of Production Efficiency of PJSC LUKOIL

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Key words and phrases: enterprise performance indicators; financial and economic activity; impact of the coronavirus pandemic in 2020; level of production efficiency.

Abstract. The purpose of the article is to study the financial and economic activities and the level of production efficiency of PJSC LUKOIL. Based on the methods of economic and statistical analysis, the author comes to the conclusion about the significant negative impact of the coronavirus pandemic in 2020 on all financial and economic indicators of the activity and production efficiency of PJSC LUKOIL.

PJSC LUKOIL is one of the largest public vertically integrated oil and gas companies in the world in terms of proven reserves and production of hydrocarbons, as well as the second largest oil producer in Russia. It was established in 1991 and currently operates in more than 30 countries around the world.

The company's sales revenues in 2019 increased by 68.1 % compared to 2018 and amounted to 444,471 million rubles.

However, in 2020, it was followed by a reduction of 17.4 %, and it amounted to 322,812 million rubles in this period. This is due to the effect of negative factors in 2020. The decline in economic activity due to the pandemic and the unprecedented drop in demand and prices for hydrocarbons that followed had a negative impact on the company's operational and financial indicators for 2020.

Among the consequences of the pandemic for the company's operating indicators in 2020: a reduction in oil production at the company's fields in Russia and for some foreign projects in connection with the new OPEC+ agreement, a reduction in gas production in Uzbekistan due to a temporary decrease in demand for Uzbek gas from China, a reduction in refining volumes due to a decrease in refining margins due to a drop in demand for petroleum products, a reduction in sales of motor fuel at gas stations due to a decrease in demand.

The main impact of the pandemic on the company's financial performance in 2020 was due to lower prices for oil and petroleum products and a reduction in production volumes.

In the structure of sales revenue, a large share is taken by revenue from the sale of oil and gas processing products. In the second place, there are revenues from the sale of oil and gas condensate. The revenues from the sale of gas are minimal.

Along with the decrease in revenue volumes, the company's expenses decreased from 20.625 million rubles in 2018 to 15.899 million rubles in 2020.

The company operates with a profit. Thus, the profit from sales in 2018 amounted to 211,380 million rubles, in 2019 393,966 million rubles, in 2020 it decreased to 275,873 million rubles.

The company's net profit changed similarly. In 2018, it amounted to 219,484 million rubles, increased in 2019 to 403,071 million rubles, decreased in 2020 to 197,558 million rubles.

Also, in 2020, the value of assets is decreasing, the return on equity is falling. In 2020 it was only 0.4 %. A negative trend is also characteristic of the dividend yield of shares.

The production of oil and gas, as well as the volume of their processing, is decreasing due to the impact of the pandemic on the economy in general and PJSC LUKOIL in particular.

The company's staff in 2020 amounted to 101.4 thousand people. In comparison with 201, the number of personnel remained unchanged.

Thus, PJSC LUKOIL is one of the largest public vertically integrated oil and gas companies in the world, accounting for more than 2 % of global oil production and about 1 % of proven hydrocarbon reserves. The company is operating at a profit, but due to the impact of the pandemic in 2020, financial indicators tended to decline.

The value of the company's balance sheet in 2018 amounted to 218,264.7 million rubles, in 2019 it increased to 2,219.229 million rubles (+1.7 %), in 2020 the balance sheet currency sharply decreased to 1,728.328 million rubles (22.1 % compared to 2019).

The company,s assets are represented by non-current and current assets. The company's fixed assets as the main part of non-current assets increased in dynamics in 2019–2020. Their cost in 2020 amounted to 15.441 million rubles.

The growth of assets in 2019 was mainly due to the growth of current assets from 543.532 million rubles in 2018 to 700.829 million rubles in 2019. In 2020, assets decreased both due to a decrease in fixed assets and due to a decrease in current assets.

Based on the data for the period from 31.01.2018 to 31.01.2020, we can draw the following conclusions.

1. The value of the organization's assets decreased, which indicates a reduction in the financial potential of the organization of PJSC LUKOIL.
2. The fall in the value of property was accompanied by internal changes in assets: there is a drop in current (2020) and non-current assets in the period under study.
3. Accounts receivable were reduced from 346,210 million rubles in 2018 to 211.650 million rubles. Cash also decreases from RUB 157.287 million to RUB 15.963 million.

The data of the analysis of liabilities indicate the following: during the study period, the following changes were observed (from 31.01.2018 to 31.01.2020).

1. The company's own funds in 2018 amounted to 1,007.643 million rubles, in 2019 and 2020 the company's own capital significantly decreased due to a decrease in profit.
2. The amount of the authorized capital amounted to 17 million rubles.
3. The Company resorts to long-term borrowed funds, the value of which in the study period increases from 278.833 million rubles to 334.495 million rubles.
4. The short-term liabilities of PJSC LUKOIL are represented by both borrowed funds and accounts payable. These liabilities grow in 2019 and then decrease in 2020.

In the structure of assets in 2018, 24.9 % were current assets. In 2019, the share of non-current assets was 68.4 %, current assets 31.6 %. In 2020, this ratio was 80.2 % and 19.8 %, respectively.

In the structure of the company capital, equity held the following shares: 2018 46.2 %, 2019 43.5 %, 2020 44.7 %. The decline in the share of equity is assessed negatively. This change was due to a decrease in retained earnings.

In 2018–2020 a low share in the company's liabilities was occupied by long-term borrowed

funds of 12.8 % and 19.4 %, respectively.

The share of short-term liabilities in the capital structure of the company was as follows: 41.1 % in 2018, 48.0 % in 2019, and 36.0 % in 2020.

The profitability of sales of PJSC LUKOIL in 2018–2019 was very high. Thus, in 2018, for every 100 rubles of revenue received by the enterprise, the enterprise received 80.0 rubles of revenues from sales. In 2019, an increase in this indicator to 88.6 rubles for every 100 rubles was a positive moment revenue. In 2020, the indicator decreased to 85.5 %.

Another indicator of profitability – return on assets – also had a high value in 2018 of 24.5 % due to the small size of assets. In 2019–2020, this indicator increased its value due to a reduction in the value of assets.

The profitability of the company's current assets increased from 40.3 % in 2018 to 57.7 % in 2020. This means that current assets were used effectively during this period.

The profitability of the company's non-current assets in 2019 increased from 13.4 % to 26.5 % compared to 2018, in 2020, with a decrease in net profit, the profitability of non-current assets decreased to 14.3 %.

The structure of fixed assets was dominated by structures and transmission devices 43.4 % in 2018. The share of the cost of machinery and equipment in the total structure of fixed assets in 2020 was 29.7 %, in 2019 32.0 %, in 2018 10.6 %. The share of vehicles in the total cost of fixed assets is the smallest: 2018 4.4 %, 2019 8.2 %, 2020 8.2 %.

The share of equipment with a service life of up to 5 years in 2018 was 4.7 %, in 2020 it increased to 8.0 %, the share of equipment with a service life of 15.1 to 30 years also increased by 1.8 % in 2019. Compared to 2018, the share of equipment with a service life of more than 45 years increased in 2018-2019, and slightly decreased in 2020.

The negative aspect of the company's performance was the reduction of the indicator reflecting the ratio of sales revenue to the number of employees of the company in 2020. In 2018, this indicator for PJSC LUKOIL was 2,579.1 million rubles/person, in 2019 it was followed by an increase of 1,804.2 million rubles/person, in 2020 the indicator was reduced. Its decrease in 2020 amounted to 1,199.7 million rubles/person, or 17.4 %. The dynamics of this indicator indicates a decrease in the efficiency of using the company's personnel.

The revenues from sales per employee did not have an unambiguous trend. In 2020 it fell by 1,164.7 million rubles/person compared to the previous period, whereas in 2019, it was noted that it increased to 3,885.3 million rubles (+1,823.1 million rubles/person, or by 88.4 %).

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Финансово-хозяйственная деятельность и уровень эффективности производства предприятия ПАО «Лукойл»

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Ключевые слова и фразы: влияние пандемии коронавируса 2020 г.; показатели эффективности деятельности предприятия; уровень эффективности производства; финансово-хозяйственная деятельность.

Аннотация. Целью статьи является изучение финансово-хозяйственной деятельности и уровня эффективности производства предприятия ПАО «Лукойл». Опираясь на методы экономического и статистического анализа, автор приходит к выводу о значительном отрицательном влиянии пандемии коронавируса 2020 г. на все финансово-хозяйственные показатели деятельности и эффективности производства предприятия ПАО «Лукойл».

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Macroeconomic Consequences of Unemployment in Russia

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Key words and phrases: current state of the world and Russian economy; economic crisis of 2020; macroeconomic consequences of unemployment; nature of unemployment in Russia.

Abstract. In order to study the macroeconomic consequences of unemployment, the article considers the features of the current state of this phenomenon in the world and Russian economy. The use of methods of economic and theoretical analysis, generalization and expert assessments allowed us to draw conclusions that the economic crisis of 2020 had a strong impact on the change in the nature of unemployment in Russia.

The key problem of the development of the economy of any country is the problem of employment and unemployment. Each country has a certain level of unemployment. If this indicator is high, it can lead to the destruction of the economy. The standard of living of the population will begin to fall, crime will increase, and the migration of the economically active population to other countries will increase. In this regard, the priority task of the Government is to minimize the unemployment rate. This is carried out as follows: creating new jobs; reforming the education system; creating favorable conditions for the development of small and medium-sized businesses (support programs, subsidies, etc.).

The problem of unemployment is a macroeconomic problem. The loss or inability to find a job puts a strong psychological pressure on a person. Most people have a falling standard of living. Unemployment is understood as a socio-economic phenomenon in which there are a certain number of people of working age in the country who can and want to work, but cannot find a suitable place of work. According to the definition of the International Labour Organization, any person who is currently not working, but is in search of work, is considered unemployed.

There is also institutional, cyclical and seasonal unemployment. We can say that unemployment is a natural part of macroeconomics, but it requires control and regulation by the state administration apparatus. Okun's law is a law of macroeconomics that establishes a relationship between GDP and the unemployment rate. It shows the deviation of the actual gross domestic product indicator from the potential one due to an increase in unemployment by 1 % relative to its natural level. The quantitative relationship between gross product and unemployment was derived by Arthur Oaken. This law states that the deviation of the total output from the assumed natural level is inversely proportional to the deviation of the unemployment

rate from the natural level.

The peculiarity of the structure of unemployment in Russia is that its volume differs significantly from the volume of production. A decrease in production by 40 % led to an increase in the unemployment rate by 10 %. Like any market, the labor market is regulated according to the laws of supply and demand. In fact, unemployment has an ambiguous impact on the state's economy. The positive effect of unemployment is that it is a side effect of the transformation of the national economy. In his absence, social reproduction will be difficult, for which additional resources are needed. It also increases the efficiency of the use of labor resources involved in the economy.

The most painful problem for many countries is precisely unemployment. Since this is directly related to the production processes, the distribution of labor resources, the level of socio-economic development of society, this leads to the following problems:

– excess in the labor market of employees of a certain specialty;
– reduction of production;
– increase in expenses (unemployment benefits);
– reduction of the qualifications of the unemployed;
– decrease in the standard of living of the population;
– under-production of national income;
– reduction of tax revenues to the budget;
– aggravation of the political situation in the country;
– the increase in the number of crimes.

Labor resources are limited, so it is impossible to restore the lost working time, and the underproduction of goods can no longer be compensated in the future. An increase in unemployment leads to a decrease in demand for goods and services. People begin to save money and buy a minimal and necessary set of goods for basic survival. In the absence of sufficient financial resources to support their families, the society resorts to the search for the salvation of the unemployed.

According to experts of the Institute of Social Analysis and Forecasting of the Russian Academy of Sciences, after the limitation of the production life due to the coronacrisis of 2020, half of Russian workers were subject to dismissal, reduction or delay in wages.

It turns out that about 35 million people were at risk. The Russian labor market tried to adapt not only through layoffs, which provoked an increase in the number of unemployed citizens, but also by reducing the working day, as well as sending employees on unpaid leave.

In May 2020, the unemployment rate crossed the line of the highest level in the last 8 years and amounted to 6.1 %. The last time it reached its maximum value was in March 2012. Since March of the same year, the number of officially registered unemployed has increased more than 4 times. According to Rosstat, the number of unemployed in the country during the coronacrisis exceeded 4.5 million people. Labor market tensions rose sharply from April to mid-summer 2020. The share of unemployed increased from 12 % to 14 % by July. At the same time, the share of employees decreased proportionally from 46 to 44 %.

Thanks to government support, public investment and monetary policy easing, many forecasts of a rapid increase in unemployment have not been fulfilled. Thus, instead of the projected 10 million unemployed citizens, Russia received only 4.5 million people who lost their jobs. Despite such disappointing figures, one of the main goals of the government's "rescue plan" for the Russian economy remains to reduce unemployment. It is planned that by the end of 2021, its level should be no more than 5 %. It is noted that for the start of economic activity, long-term three-year subsidies will be paid as a share of the amount of taxes paid by

organizations to the state.

It turns out that these subsidies will be used to pay off debts to suppliers, to pay wages, as well as to pay taxes and loans. Of particular importance is the project of interest-free lending to small and medium-sized businesses, developed by the largest banks together with the Government of the Russian Federation and the Central Bank. Loans are issued to companies to pay salaries to employees (as of March 30, 2020). The loan amount consists of the total number of employees multiplied by the minimum wage and by six. The rate is 0 % per annum, which greatly facilitates the existence of companies during the state's fight against viral infection and contributes to the speedy restoration of the vital activity of enterprises.

Such a phenomenon as unemployment causes significant damage to people's lives, prevents them from realizing their potential and opportunities and worsens their financial situation. Despite the fact that temporary unemployment of the economically active population has always been an integral part of the market economy and a natural process of economic development, the fight against it is more acute than ever at a difficult time for the entire pandemic. There is a risk that such unemployment will last for more than a year. It may take quite a long time to get out of quarantine and solve the main economic problems. This, of course, will force us to rethink the prospects of a particular industry and restore production to its original state, thereby providing the population with full employment, preventing a drop in living standards, avoiding social disasters and returning the economy of our state to the "normal life".

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Макроэкономические последствия безработицы в России

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Ключевые слова и фразы: макроэкономические последствия безработицы; современное состояние мировой и российской экономики; характер безработицы в России;

экономический кризис 2020 г.

Аннотация. С целью изучения макроэкономических последствий безработицы в статье рассмотрены особенности современного состояния этого явления в мировой и российской экономике. Применение методов экономико-теоретического анализа, обобщения и экспертных оценок позволило сделать выводы о том, что экономический кризис 2020 г. оказал сильное влияние на изменение характера безработицы в России.

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FOR NOTES

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