Advances in Social Science, Education and Humanities Research, volume 527
Proceedings of the VIII International Scientific and Practical Conference 'Current problems of social and labour relations' (ISPC-CPSLR 2020)

The Analysis of the External Conditions for the Functioning of Organizations Carrying Out Design and Survey Works for Oil and Gas Companies

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ABSTRACT
Design and survey works (DSW) are an important condition for the effective functioning of oil and gas production enterprises. Currently, research and design institutes (RDI) are faced with high uncertainty in the development of the market characterized by price fluctuations, changing demand and dependence on the world market conditions. In this regard, a detailed study of the multifaceted business environment of the functioning of organizations carrying out DSWs for oil and gas companies is important in order to provide the necessary degree of flexibility and adaptability of organizations to maintain a stable competitive position in a changing environment.
In the course of the study, answers were given to questions about specific environmental factors affecting the activities of RDIs, the degree of influence of these factors, as well as the question of which factors have the greatest impact on the industry.
To assess the influence degree of environmental factors, a PEST analysis was carried out taking into account political, economic, social and process environmental factors that can affect the activities of the RDI. It is concluded that the greatest influence on the activities of RDIs is exerted by political and processing factors that can significantly affect the business processes and results of organizations.

Keywords: *Research and design institutes, Design and survey works, Economic factors, Processing factors, Oil and gas companies.*

1. INTRODUCTION

In the Russian economy, the oil and gas industry is one of the key industries that support the national economy. Oil and gas production is constantly increasing, which requires additional DSWs in the field of exploration, infrastructure development, field development, as well as ensuring industrial safety, protection of subsoil, environment and labor of workers.

DSWs are an important condition for the effective functioning of oil and gas production enterprises. Currently, organizations carrying out DSWs are faced with high uncertainty in the development of the market characterized by price fluctuations, changing demand and dependence on the world market conditions, which justifies the need for the strategic analysis aimed at ensuring an effective planning process that allows organizations to develop in a competitive environment in the long term perspective.

2. RESEARCH OBJECTIVE

Research and design institutes provide scientific and technical support services for projects that not only help reduce exploration and development costs, but also increase the competitiveness of companies through innovation and new technologies. This determines the importance of assessing the factors influencing the activities of the RDIs, both for the institutes themselves and for oil and gas companies that order services. An objective impact assessment of key factors will help reduce the operational risks of RDIs and increase the financial performance of their business.

To improve the efficiency of DSWs for oil and gas producing enterprises, it is necessary to consider them in the future taking into account the increasingly complex economic relations, increased competition, uncertainty, risk, and possible crisis phenomena. Perhaps even new business models should be applied for cooperation with customers as recommended by [1] saying: "...While research already recognizes that the characteristics of transforming economies require firms to use different business models to those found in established economies...".

The purpose of this study is to systematically assess the key impacts on the current and future position of domestic RDIs that provide services to oil and gas complex enterprises (OGC), and to determine their specific impact on the strategic development of institutes.

Taking into account the influence of one factor or another, companies can respond to them in a timely and effective manner in order to increase the sustainability of their operation and development.

3. RESEARCH METHODOLOGY

The study used the systemic and situational analysis methods, the method of expert assessments, observation, comparative analysis of factors affecting the activities of domestic RDIs. Search, systematization, grouping and analysis of the collected data are used as research techniques.

To assess the influence degree of environmental factors, a PEST analysis was carried out taking into account political, economic, social and process environmental factors that can affect the activities of the RDI. When assessing the factors, not only their actual states were taken into account but also a predictive qualitative assessment of possible changes in factors for several years ahead was given.

The experts in the field of DSWs for oil and gas producing enterprises were: specialists of the planning and economic analysis department and the analytical department of RN-BashNIPIneft LLC (in the amount of 5 persons).

The influence degree of each factor on the DSW volume was assessed on a three-point scale: 1 point is a low impact; 2 points are a average impact; 3 points are a high impact. The probability of changing each factor was assessed on a five-point scale: 1 point is a low probability, 5 points are a high probability. The factors considered can have a positive and negative impact [2].

4. RESULTS

Political factors

The introduction of anti-Russian economic and technological sanctions against Russia (restrictions on foreign funding, a ban on the supply of equipment and technologies). The sanctional pressure led to the withdrawal of foreign capital from the Russian oil and gas sector, which suspended the joint scientific cooperation and exchange of developments. The revenue and hence the financial resources of Russian oil and gas companies may decrease in the long term, which will negatively affect the DSW volume. The thing that US sanctions came to us for a long time is evidenced by the fact that "…In July 2017, Congress passed the Countering America's Adversaries Through Sanctions Act. The legislation – which enjoyed nearly unanimous legislative support – contained sanctions targeting Russia, North Korea, and Iran…» [3]. On the other hand, sanctions can have a stimulating effect in the direction of increasing funding for research and development, DSWs and import substitution.

OPEC + deals. The change in demand for DSWs is directly related to the demand for oil and gas products. On May 1, 2020, the OPEC + deal entered into force, which implies a decrease in oil production by 2.5 million barrels (17-18%). Such a massive reduction in production may negatively affect the DSW volume.

Strengthening control by state regulatory bodies (Federal autonomous organization "Glavgosexpertiza of Russia"). When conducting an examination of design documentation and the results of engineering surveys of oil and gas facilities for compliance with sanitary and epidemiological and environmental requirements, it is possible to impose fines in case of violations.

Introduction of new requirements for process engineering, design and detailed design documentation. Amendments to the Decree of the Government of the Russian Federation as of February 16, 2008 N 87 "On the composition of sections of design documentation and requirements for their content".

Economic factors

Growth rates of the world economy. The peculiarity of this factor is a positive impact on demand for hydrocarbons - in the case of positive dynamics and negative - in the event of a slowdown in growth rates. In recent years, there has been a decrease in the growth rate of demand for hydrocarbons associated with a slowdown in the growth of the world economy, and as a result, a decrease in prices for hydrocarbons (long-term trend), which leads to a decrease in income and investment opportunities for oil and gas companies. As a result, investments in DSWs and demand for RDI services are reduced. According to updated OECD forecasts, global GDP will decline by 6% in 2020.

At present, experts differ in their forecasts regarding the economic growth rate for the near future [4]. Despite a gradual recovery due to stimulus measures taken by many countries, the future prospects for the global economy are uncertain due to persisting epidemiological risks [5].

Offer of hydrocarbons in the global energy market. In the short term, supply is expected to grow due to the development of the liquefied natural gas (LNG) market, cheaper and higher production of unconventional hydrocarbons (shale oil and gas, etc.). As a result, there will be a decrease in prices for hydrocarbon raw materials (long-term trend), incomes of companies and investments in DSWs.

Prices for imported equipment and components. Currently, there is an increase in the cost of supply and maintenance of imported equipment and components, a deterioration in the financial performance of oil and gas complex companies.

Increase in the cost of production and transportation of hydrocarbons. This factor is associated with the natural "aging" of existing assets, a decrease in the scale and quality of new fields, and access to remote oil and gas provinces. It leads to a deterioration in the financial performance of oil and gas complex companies.

Tax system. Recent years have been characterized by a tightening of the tax regime. A characteristic feature is the high level of tax burden (MET + customs duties) on the oil and gas complex, which does not allow taking into account the problems of the deteriorating resource base in traditional production regions and the need to develop new regions. The ongoing non-systemic changes in tax regulation as a whole lead to the opacity of the current taxation system, an increase in risks, which entails the problem of reducing investment activities in the oil industry.

Exchange rate. The factor does not have a definite influence. On the one hand, the weakening of the ruble is beneficial for Russian oil and gas companies as exporters of hydrocarbons. On the other hand, companies are constantly involved in the procurement of imported equipment while modernizing the technological base and, therefore, incur losses in the event of weakening the national currency.

The volatility of exchange rates increases the risks for companies operating in the international market, leads to a decrease in business activity, a decrease in the investment level. The exchange rate value is determined by many factors: world prices for hydrocarbons, forcing liquidity into the world economy, interest rates on the dollar, currency interventions on the part of the Central Bank of the Russian Federation. Experts disagree about the future dynamics of the ruble against the dollar.

Inflation rate. It is reflected in the growth of prices for acquired assets, which leads to an increase in costs.

Improving consumption energy efficiency. It leads to a drop in demand for hydrocarbons. The consequences for the oil and gas complex and RDIs are similar to those discussed above.

Technological, industry factors

Development of alternative energy sources, de-carbonization of the world economy. It may lead to a decrease in oil and gas consumption, a drop in demand for RID services in the field of hydrocarbon exploration and production

Activation (curtailment) of investment programs for exploration and development of deposits. It leads to an increase (decrease) in demand for RDI services

Reduction of the mineral resource base of oil and gas companies, depletion of traditional hydrocarbon reserves. It leads to the need to direct significant efforts of oil and gas companies to replenish the resource base through the discovery of new fields in both old and new remote oil and gas provinces, which requires investments in geological exploration works (GEW), services for the design of the development of new fields including application of innovative solutions.

Reduction of reserves of the most accessible and profitable deposits, increase in the share of hard-to-recover reserves (HTR). It forces oil and gas companies to pay attention to the development of HTR and unconventional hydrocarbon reserves (shale oil (gas), oil sands, offshore projects), which requires the use of innovative technologies. As a result, there is a growing need for R&D and DSWs, RDI services.

Social factors

Lack of professional staff. Decrease in the training quality of graduates of domestic industrial universities in the field of DSW-related competencies. This factor can significantly increase the company's risks [6].

Environmental protection legislation. Changes in the legislation on environmental protection (clarification of standards for permissible emissions and discharges of substances and microorganisms, noise reduction, measures to neutralize pollutants, and other negative impact on the environment) lead to a change in the volume of DSWs.

Note that the level of world prices for hydrocarbon raw materials is not singled out as an independent group since it is secondary in relation to such factors as the growth rate of the world economy, increased energy efficiency of consumption, the development of alternative energy sources (they determine the demand for hydrocarbons), the supply of hydrocarbons in the world energy market and geopolitical factors.

Table 1. The results of assessing the significance of external factors on the activities of research and design organizations

External strategic factors	Significance (weight)	Industry readiness assessment to respond to a factor	Weighted estimate
Introduction of anti-Russian economic and technological sanctions against Russia	0.06	3	0.18
OPEC + deals	0.06	1	0.06
Strengthening control from state regulatory bodies	0.06	4	0.24
Introduction of new requirements for process engineering, design and detailed design documentation	0.03	5	0.15
Growth rates of the world economy	0.06	1	0.06
Offer of hydrocarbons in the global energy market (У)	0.03	2	0.06
Prices for imported equipment and components	0.03	1	0.03
Increase in the cost of production and transportation of hydrocarbons	0.06	2	0.12
Tax system	0.06	2	0.12
Exchange rate	0.03	1	0.03
Inflation rate	0.03	1	0.03
Improving consumption energy efficiency	0.03	1	0.03
Development of alternative energy sources, de-carbonization of the world economy	0.06	1	0.06
Activation (curtailment) of investment programs for exploration and development of deposits	0.09	1	0.09
Reduction of the mineral resource base of oil and gas companies, depletion of traditional hydrocarbon reserves	0.09	3	0.27
Reduction of reserves of the most accessible and profitable deposits, increase in the HTR share	0.09	3	0.27
Lack of professional staff	0.09	2	0.18
Environmental protection legislation	0.03	3	0.09
Outcome evaluation	1		2.09

Most of the listed environmental factors are stable trends and, therefore, forecasting them is not difficult. The exception is such difficult-to-predict factors as the growth rate of the world economy, the exchange rate, and the tax system.

It should be noted that the factors considered have for the most part an indirect effect on the RDI activities since they manifest themselves through the results of influencing the activities of oil and gas companies that provide more than 90% of the demand for services in

the field of research and development and design [7]. In general, since 2014, due to the financial and economic crisis and the fall in prices for hydrocarbon raw materials, and as a result of the deterioration in the performance of oil and gas companies, there has been a decrease in demand for RDI services.

Taking into account the direction of action, the listed factors can be assessed as threats (sources of risks), the consequences of which are determined by the readiness of oil and gas companies to resist them.

Further, the significance of external factors was assessed taking into account the assessment of the readiness of the RDI sector to respond to these factors (table 1). The impact assessment of the significance of external factors on the medium term (3-5 years) was based on the following background cause: the indirect influence of external factors on the RDI activities (through the performance indicators of oil and gas companies).

The final assessment (2.09) reflects the low readiness degree of the RDI to respond to current and projected factors of external influence of the macroenvironment.

5. DISCUSSION

In general, we can conclude that political and processing factors have the greatest influence on the RDI activities.

Particular attention should be paid to the group of threat factors "Processing ones", the success of overcoming which requires oil and gas companies to concentrate on solving innovative problems aimed at increasing the efficiency of exploration works, developing technologies and technical solutions that ensure the effective development of unconventional sources of hydrocarbons, such as bituminous sandstones, Bazhenov formation, etc., implementation of shelf projects, increasing the oil recovery factor (ORF) [8].

Research and design institutes "...strive to have comprehensive competencies in the field of exploration, development and operation of deposits, have the competence of engineering services" [Koshovkin I.N, 9].

The complexity of the current situation is aggravated by the fact that the need to develop fields and produce hard-to-recover hydrocarbons "...requires the development of new technologies and significant investments in DSWs and research and development. [Kaverin A.A., Zhabin A.B., 10]. It is necessary to expand cooperation with the largest foreign RDIs. But this is difficult under the current macroeconomic and geopolitical conditions since it does not have resource support [11].

6. CONCLUSION

In the course of the study, it was concluded that political and processing factors that can significantly affect the business processes and results of organization activities have the greatest impact on the activities of RDIs.

The final assessment of the significance of external factors was obtained taking into account the assessment of the readiness of the RDI sector to respond to these factors, which amounted to 2.09 points. This indicates a low readiness degree of the RDI to respond to current and projected factors of the external environment impact, which is explained by the significant dependence of these organizations on the financial performance of oil and gas complex companies.

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