Publication date: August 31, 2022
DOI: 10.52270/27132447_2022_11_19

THE RUSSIAN GAS INDUSTRY AND ITS IMPACT ON THE DEVELOPMENT OF THE TERRITORIES OF THE FAR NORTH

Danilchenko, Sergey Leonidovych[1]

[1]Doctor of Historical Sciences, Professor, Sevastopol State University, 33, Universitetskaya Street, Sevastopol, Russia, E-mail: sldistorik@bk.ru

Abstract

The article discusses the history of the discovery of gas fields in Russia. At the same time, the methods of oil and gas extraction are shown, as well as environmental risks in certain ways of developing territories, which requires a revision of approaches to the problems of nature protection and the use of natural resources.

The new concept of hydrocarbon resources development is based on the principles of environmental regulation, implying the replacement of the "impact control" approach to the environment with the "impact prevention" approach, taking into account the peculiarities of the natural situation.

Keywords: nature, city, society, land, climate.

I. INTRODUCTION

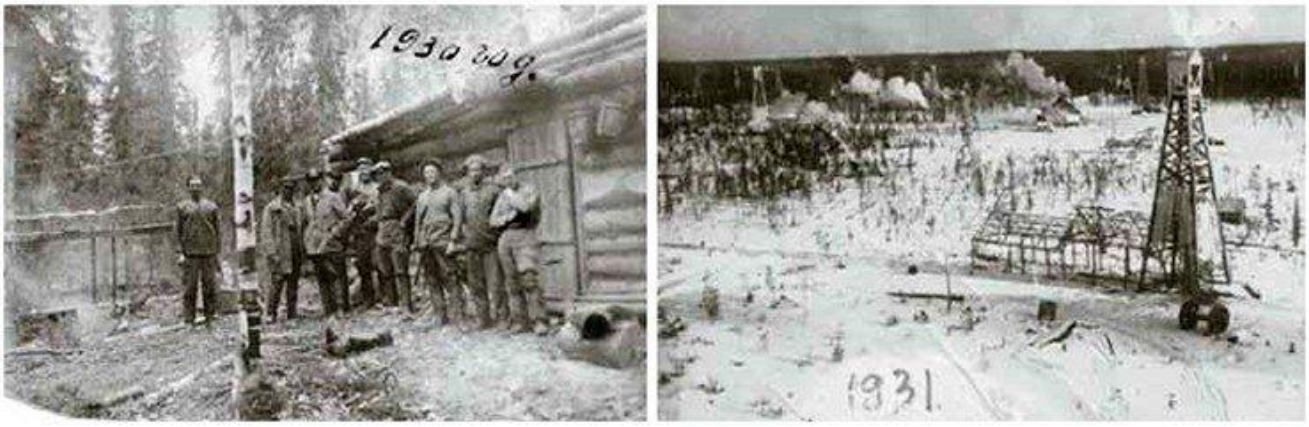
Today, Russia is among the three world leaders in hydrocarbon production: in 2014, 525 million tons of oil and 668 billion m3 of natural gas were produced in our country. At the same time, more than 90% of all our gas and about 10% of oil come from deposits in the Russian sector of the Arctic, i.e. the Arctic regions of Russia. It is not surprising that it was our country that historically led in many areas of development of Arctic oil and gas resources, from exploration to commissioning of new fields, and did it relying on domestic science and domestic technologies.

By the Russian sector of the Arctic, the author understands the territory of the Arctic regions of Russia and the waters of the Arctic Ocean seas under the jurisdiction of Russia

The search for oil and gas deposits in the continental sector of the Russian Arctic was started in the 30s of the twentieth century. Other Arctic countries in those years did not search for oil and gas in the Arctic.

II. DISCUSSION AND RESULTS

The development of oil and gas resources of the Arctic territories of the Soviet Union in the years before the Great Patriotic War and during the war, a great contribution was made by outstanding Soviet geologists N. A. Gedroits, T. K. Emeliantsev, A. Ya. Krems, N. N. Rostovtsev, G. E. Ryabukhin, V. N. Saks, I. N. Strizhov, N. N. Tikhonovich et al. In 1930, the world's first oil field in the Arctic, the Chibyuskoye, was discovered in the Komi Republic. In the same year, its development began. Two years later, in 1932, the large Yaregskoye field was discovered, and in 1935 it was put into development.



Chuta campaign A. M. Romanenko. In 1930, the world's first oil field in the Arctic, the Chibyuskoye, was discovered in the Komi Republic. The photo shows a panorama of Chibyu, 1931 © UMP Museum.

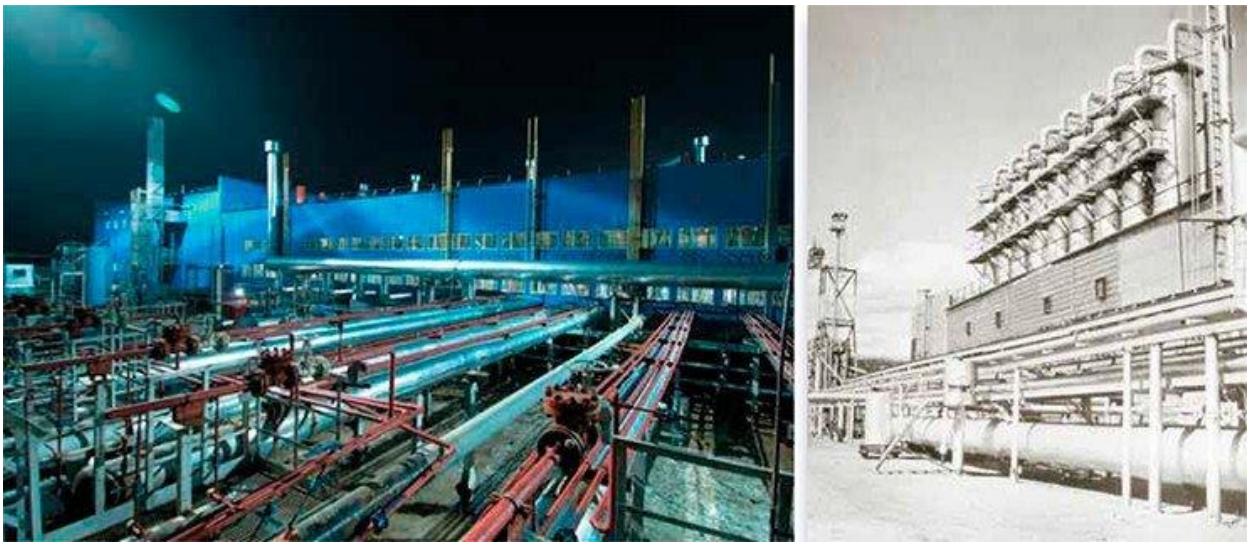
Thus, the Soviet Union was the first state in the world to start prospecting, exploration and development of deposits in the Arctic. The Yaregskoye field is a pioneer not only in oil production in the Arctic, but also in a number of other indicators. Oil from the Yaregskoye field is heavy, with a density of 945 kg/m3, and viscous. Reservoir temperature 6–8 °C. It was one of the first hard-to-recover oil fields to be developed. The mine (1939), and then the thermal mine (1972) method of oil production was first tested on it.

On June 22, 1936, exactly five years before the start of World War II, the Council of People's Commissars of the USSR adopted a resolution on the creation of the Main Directorate of the Northern Sea Route under the Council of People's Commissars (SNK) of the USSR (Glavsevmorput). By the decree of the Council of People's Commissars of the USSR, the Glavsevmorput was entrusted with the following tasks: the final development of the Northern Sea Route from the Barents Sea to the Bering Strait; organization of sea, river and air communications, radio communications and research work in the Soviet Arctic; the development of productive forces and the development of the natural wealth of the Far North, the promotion of the economic and cultural upsurge of the indigenous population of the Far North and the attraction of this population to active participation in socialist construction.

It was determined that the area of activity of the Main Directorate of the Northern Sea Route is the islands and seas of the Arctic Ocean in the European part of the USSR, and the territory north of the 62nd parallel in the Asian part of the USSR. The well-known scientist, academician of the USSR Academy of Sciences O. Yu. Schmidt was appointed the first head of the Glavsevmorput. In particular, the organization of geological work, prospecting and exploration of minerals, as well as the organization of enterprises for the extraction of these minerals, was assigned to the Glavsevmorput. For this purpose, a mining and geological department was created as part of the Glavsevmorput. In the middle of the 1930s. searches for oil were organized in the eastern regions of the Soviet Arctic, in the north of Siberia. In 1935, the Nordvik expedition (T.K. Emelyantsev) described surface oil seeps in the Nordvik region on the coast of the Laptev Sea.

In 1936, in the lower reaches of the Yenisei, the Ust-Yenisei expedition of the Mining and Geological Administration (N.A. Gedroits) discovered methane gas outcrops. Work in these areas continued during the Great Patriotic War. In 1942, in the lower reaches of the river. Yenisei on the Malokheta structure (well No. 13-R) received the first inflows of gas, and then oil. In 1944, in the well. No. 102-P received an influx of oil. During the war years, geological surveys in the very center of the Arctic regions of Western Siberia were carried out by V.N. Saks. In 1945, he recommended the lower reaches of the river as one of the priority areas for prospecting for hydrocarbon deposits.

In the 60-70s. 20th century the main volumes of geological exploration were concentrated in the newly discovered giant West Siberian oil and gas province. In 1962, the first gas field was discovered in the Yamal-Nenets Autonomous Okrug, in the Arctic part of the West Siberian oil and gas province - Tazovskoye. This event was followed by the discovery of new fields: 1964 - large Novoportovskoye oil and gas condensate field, 1965 - large Gubkinskoye oil and gas condensate field, 1965 - unique Zapolyarnoye gas field, 1966 - unique Urengoy oil and gas condensate field, 1967 - unique Medvezhye gas field, 1968 - Arctic gas field, 1968 - Russian oil field, 1969 - unique Yamburg field. Before Western Siberia, the world did not know such gas giants.



Natural gas treatment unit at the Yamburgskoye field. 2007 © OAO Gazprom, 2015. Integrated gas treatment plant №. 5 of the Yamburgskoye field, commissioned in January 1988 © OOO Gazprom dobycha Yamburg.

In the 70s of the last century, the turn of discoveries came on the Yamal Peninsula. In 1971, a unique gas field was discovered – Bovanenkovskoye, in 1974 – Kharasaveyskoye and Yuzhno-Tambeyskoye, in 1986 – Rostovtsevskoye gas and oil field.

In the 80-90s of the last century, oil and gas fields were discovered in the north-east of the West Siberian oil and gas province, in the lower reaches of the Yenisei in the Krasnoyarsk Territory - the unique Vankor and large Tagul, Lodochnoye, Suzunskoye. In the Timan-Pechora oil and gas province, in the Komi Republic, large gas condensate Vuktyl (1964), oil – Usinskoye (1963) and Vazeyskoye (1972) fields were discovered. In the 1970s—1980s, a large group of large deposits was discovered even further north, in the Nenets Autonomous Okrug of the Arkhangelsk Region: Kharyaginskoye (1970), Naulskoye (1979), Yuzhno-Khylchuyskoye (1981), Toboisko-Myadseiskoye (1984), R. Trebs (1987), A. Titova (1989) et al. In total, 20 large and medium-sized deposits have been discovered in the Nenets Autonomous Okrug. The largest of them are Kharyaginskoye, named after R. Trebs, Toboisk-Myadseiskoye. In the early 80s of the twentieth century, deep exploratory drilling was started in the western sector of the Russian Arctic (the Barents and Kara Seas).

The first wells were drilled on the Arctic islands. And one of them immediately gave the result.

In 1982, a sand-lake deposit with oil and condensate gas deposits was discovered on Kolguev Island. Two years later, in 1985, its pilot operation was started.

Bovanenkovskoye giant oil and gas condensate field on the Yamal Peninsula. © OAO Gazprom, 2015.

Search operations were continued in the Barents and Kara Seas. Already by the mid-eighties, 3 deposits were discovered (Murmansk, Severo-Kildinskoye and Pomorskoye). In the second half of the 80s, four more fields were discovered, two of them unique gas fields (Shtokmanovskoye and Rusanovskoye) and two oil fields (Severo-Gulyaev and Prirazlomnoye). In the 1990s, eight more deposits were discovered, of which one (Leningrad) is unique and 6 are large. The total reserves of these fields exceed 10 trillion m3 of gas and 0.5 billion tons of oil. More recently, Rosneft announced the discovery of another giant in the Kara Sea. The deposit was called sacred for every citizen of Russia by the word "Victory". Today, over 90% of all gas reserves and over 45% of oil reserves on the shelves of the circumpolar belt of the Earth are concentrated on the Russian Western Arctic shelf of the Arctic Ocean seas.

Currently, the north of the West Siberian Oil and Gas Province (YANAO) is the largest gas producing region in the world and a major center of oil production.

The huge volumes of oil and, especially, gas produced in the Arctic for more than 40 years create the illusion that this has always been the case. My generation, the generation of the creators of this phenomenon, know that behind the discoveries and exploration, the development of these fields, the creation of transport infrastructure, the creation of equipment for the discovery, exploration and development of oil fields, the creation of comfortable living conditions for the conquerors of the depths of the Russian North was a giant, unique, it would not be an exaggeration to say, the heroic work of several generations of scientists of the USSR Academy of Sciences, universities of the country, branch institutes of the Ministry of Geology of the USSR, The Ministries of Oil and Gas Industry of the USSR and many other ministries and departments, engineers, workers in many sectors of the economy, doctors, teachers. The solution of the super-tasks of forecasting, scientific substantiation of search directions, creation of exploration technologies, development of unique gas fields, creation of transport infrastructure, construction technologies in the most difficult natural and climatic conditions of the Arctic was fully provided by domestic science, engineering corps, industry, using domestic technology and domestic equipment.

The world practice did not have such experience and such results of forecasting, prospecting, exploration and development of gas fields in the Arctic in those years.

Russia is a leader in many areas of development of hydrocarbon resources in the Arctic. Russia was the first to discover hydrocarbon deposits in the Arctic, created unique technologies, explored and began their development, designed and built gigantic transport systems that have no analogues in the world. Particularly impressive are the achievements of our country in the development of unique gas fields in the Arctic regions of Western Siberia (Medvezhye, Urengoyskoye, Yamburgskoye, Zapolyarnoye, Bovanenkovskoye). Neither the United States nor other Arctic countries have experience in mastering such gas phenomena.

In the Arctic, in the search, exploration and commissioning of oil and gas fields, the Soviet Union - Russia has always been the first to rely on domestic science, domestic technologies, domestic industry, and therefore on domestic personnel!

In the coming years, the Russian sector of the Arctic will continue to play a leading role in gas production. Its role in oil production will increase.

In terms of gas production, the main gas base of the country will undoubtedly remain the Yamalo-Nenets Autonomous Okrug. In the YNAO, gas production will be shifted to the Yamal peninsula (Bovanenkovskoye, in the future – Kharasoveiskoye, the Tambeysky group and other fields). Wet gas production will grow in the Nadym-Pursky region of the YaNAO.

In the context of increased competition between gas suppliers to the world markets, it is necessary to carefully and with the obligatory consideration of all risks begin to develop and put into development new gas regions.

Oil production in the Arkhangelsk region, in the north of Western Siberia, in the Yamalo-Nenets Autonomous Okrug and the Krasnoyarsk Territory in the face of declining production in the "mature" regions should increase. The raw material base for this has been created.

In the Arkhangelsk region, if there is demand for oil and investments, it can reach by 2020-2025. 22-25 million tons per year. In the Republic of Komi, the oil company OAO Lukoil plans to increase production at the region's oldest field, the Yaregskoye field. Oil production at this field has been going on for 80 years and has exceeded 20 million tons in total. In different years, the company's specialists call the prospective level of oil production at the field from 2-3 to 5-6 million tons per year. To transport heavy viscous Yarega oil, Transneft and Lukoil built the first stage of the Yarega-Ukhta oil pipeline, 38 km long. Its throughput capacity is 1 million tons of oil per year. A new development technology is being tested, which will bring the oil recovery factor up to 0.85. At the deposit, the volume of construction of mine workings in the next 2-3 years will increase by 1.3 times, drilling - by 1.2 times.

III. CONCLUSION

The energy aspects of the development of the Arctic region are inextricably linked with the problems of climate change. High latitudes seriously affect cyclonic activity in the Northern Hemisphere and affect the functioning of the Gulf Stream and the North Atlantic Current. Oil and gas is available throughout the entire northern border of Russia, but the climatic features of the region, transport problems, financial and technological sanctions of the West, low oil prices, uneven occurrence of oil and gas reservoirs, as well as insufficient knowledge of this region make it difficult to extract oil and gas in the Far North . At this stage, it is necessary to focus on exploration.

The main task for departments and companies implementing projects in the Arctic is the development and use of Russian drilling technologies, as well as the involvement of foreign companies from countries that did not support the sanctions. So, it is necessary to continue to conduct scientific research aimed at creating equipment and technologies for prospecting, exploration and development of oil and gas fields on the shelves of the Arctic seas, in areas of year-round ice, etc.

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РОССИЙСКАЯ ГАЗОВАЯ ОТРАСЛЬ И ЕЕ ВЛИЯНИЕ НА РАЗВИТИЕ ТЕРРИТОРИЙ КРАЙНЕГО СЕВЕРА

Данильченко Сергей Леонидович[1]

[1]Доктор исторических наук, профессор, Севастопольский государственный университет, ул. Университетская, 33, Севастополь, Россия, E-mail: sldistorik@bk.ru

Аннотация

В статье рассматривается история открытия газовых месторождений в России. В то же время показаны методы добычи нефти и газа, а также экологические риски при определенных способах освоения территорий, что требует пересмотра подходов к проблемам охраны природы и использования природных ресурсов.

Новая концепция освоения углеводородных ресурсов основана на принципах экологического регулирования, подразумевающих замену подхода "контроль воздействия" на окружающую среду подходом "предотвращение воздействия" с учетом особенностей природной ситуации.

Ключевые слова: природа, город, общество, земля, климат.

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