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GAS FIELDS AND GAS PROCESSING IN BASHKORTOSTAN

On the eve of new century the fuel-power complexes development is the main industrial branch, determining technical progress [1,2].

Oil-gas industry keeps the development of many other branches of industry: power, machine-building, chemical, agricultural and others. At the same time the Bashkortostan gas industry takes the important place in oil and gas branches of Russia. That's why the formation analysis is necessary for definition the development perspectives, because without yesterday there are no today and tomorrow.

Geological-prospecting works in Ural-Volga region had been fulfilled in the second half of the XIX century, but the first unsuccessful attempts led to prolonged works break on this territory.

Under academician Ivan Gubkin leadership five-year (1929-1933) the program was elaborated of reconnaissance and prospecting of oil fields of Ural and Povolgje. The fulfillment of this program brought to creation of Volga-Ural oil basis of our country [3].

The discovery in 1932 of Ishymbai oil-field (under the leadership of geologist A.A.Blochin) was the first giving hope achievement (the oil from lime-stone reef of Permian formation was discovered). Till 1935 there was already large oil-field created, about 500 thousand tons were extracted, and in 1937 – 1 million tons.

During next years the next oil-fields were discovered: Tuimazinskoje (1944), Serafimovskoje (1948), Shkapovskoje (1953), Arlanskoje and Mancharskoje (1955), Igrovskoje (1961), Raevskoje (1970), Urshakskoje (1971), Buraevskoje (1972), Dobrovolskoje (1973), Buzovjazovskoje (1974), Shangack-kul (1975), Gordeevskoje (1976), Orlovskoje (1977), Naratovskoje (1978), Kabackovskoje (1979).

During 1932-1991 there were 245 oil and gas fields discovered in Bashkortostan, 1380 tons of oil and 57 milliard cubic meters of gas were extracted [4].

The first investigation of hydro-carbon gases, dissolved in Bashkirian oil, was made in 1935 – the initial stage of Ishimbai field exploitation [5]. The gas composition study and its quantity extracted together with oil was carried out by Central Scientific Laboratory of Bashkirian Oil-Chemical Group.

In 1935 there was the scientific group of laboratories created in Ufa for decision of appearing problems (structure and bedding conditions of oil and gas containing rocks, choosing of reconnaissance directions and so on). There were geo-chemical, oil, bitumen laboratories, producers' geology department in its structure. Here the prominent specialists of oil-refining industry began their scientific work, such as A.A.Trofimuk, K.R.Timergazin, A.J.Vissarionova, V.A.Balaev, A.F.Shamov, M.F.Mikrjukov, P.S.Porfirjev and others.

Comparative volume of oil and nature gas is given in the next table.

Republic	1965	1970
Russian Federation	5131	11258
Including: Bashkiria	1344	1067
Tataria	2078	3630

The fast development of oil-gas wells' works demanded the deepening and widening of scientific investigations: Ufa Scientific Institute was created on the basis Central Scientific Laboratory in 1947. The litology-stratigraphic scheme of Bashkiria was worked out those years and it was preserved almost without changes till present time.

The oil content perspectives on the territory of Bashkortostan are connected with Pred-Ural rock flexure. Gas and gas-condensate fields are spread to the south from Meleuz, oil fields with small gas content are situated in north regions. The main part of gas, extracted in Bashkortostan, is passing gas of oil fields.

In western oil refining region of Bashkortostan (Tuimazinskoje, Alexand-rovskoje, Serafimovskoje, Konstantinovskoje, Leonidovskoje, Shkapovskoje, Belebeevskoje oil-fields) mainly Devonian small-sulphureous oil is extracted with gas factor 55-60 cubic meters/ton. For southern (Ishimbaiskoje and some small fields), north-western (Arlanskoje, Nicolo-Berezovskoje, Moncharov-skoje, Checkmagushevskoje and others) ones the coal-bearing highly-sulphureous oil of big viscosity is typical with gas factor 100-103 cubic meters per ton (southern) and 16-30 cubic meters/ton (north-western).

The oilgas processing history begins in 1940, when Ishimbaisky gas-benzine work was projected (start working in 1943).

Tuimazinsky gas-refinery blocks were built in 1954.

Most rapid development of gas industry of Bashkortostan, as of the whole country, had began in August 1958, after passing the Resolution of Central Committee of Communist Party and Council of Ministers of the USSR "About Further Development of Gas Refinery and Gas Supply of Enterprises and Cities of the USSR".

Shkapovsky gas-refinery plant was put into operation in 1961 [6].

But the richest resources of nature gas were used very unsatisfactory. The reason was not complex building of plants.

All the oilfields of Bashkortostan extracted oil and gas according to self-flowing scheme applying measure-separation plants. The building of gas-gathering systems, especially in north-western region, was noticeably behind the oil gas extraction. Oil fields were put into operation without compressor stations, oil-stabilization plants, consumers were not ready to passing gas reception. As the result the development of gas refining industry was noticeably behind the oil gas extraction. Shkapovsky gas refining plant was built in 7 years after the field putting into operation, Tuimazinsky – in 10 years. The gas looses those years had reached 90%. To 1962 only 40% of extracted gas processed, the rest one was burnt.

To the beginning of 60s years there were 600 gas-petrol enterprises and plants in USA, refining more than 250 milliard cubic meters per year of passing and nature gas, in Canada – 50 gas-petrol enterprises of capacity 55 million cubic meters per day. At the same time (in 1962) there were 4 modern gas-petrol enterprises in the USSR (Tuimazinsky, Shkapovsky, Minnibaevsky and Muhkaevsky) and some small concerns.

Their building permitted to increase the development of gas industry as a self-dependent branch of national economy.

The main produce at the initial period of gas-petrol enterprise exploitation was dry gas. The problem of liquid gas rational use was not solved yet. For example, the big quantity of liquid gas was burnt because of consumers lack.

The project of Central gas-petrol enterprise with oil absorption and artificial cooling was worked out for oil gas processing of Arlansky and nearest fields. But it was proved, that more expedient is to use compact plants, giving opportunity to begin gas raw processing practically simultaneous with putting the field into operation, without considerable expenditure on gas and produce pipe-lines.

For effective mastering of Saratovsky and Isymovsky gas-condensate fields (Kugarchinsky region) the complex enterprise creation of gas extraction and refinery was recommended. The principal technological scheme of gas extraction and refinery, gas and condensate cleaning, sulphur receipt, gas and condensate transportation was worked out.

In the middle of 50s gas pipe-lines were built: Tuimazy – Ufa, Shkapovo – Ishimby, Ishimby – Magnitogorsk, Shkapovo – Tubankyl. Further the next ones were built: Kumertau – Ishimby (1960), Magnitogorsk – Sterlitamak (1966), Ishimby – Ufa (1967). All these pipe-lines provided the gas necessity in Bashkortostan.

Rapid development of "Bashtransgas" enterprise began in the beginning of 80s, when gas main lines were built with compressor stations. Now there is a lot of modern equipment installed. In prospect the obsolete equipment is to be changed.

"Bashtransgas" has built 1139 kilometers of new gas pipe-lines in Bashkortostan during last ten years. It makes up 80% of the common number of pipe-lines built. Only for 5 last years the number of gas-distributing stations has increased from 96 till 127. It's not by accident that Bashkortostan may be compared with Moscow and Leningrad regions. Bashtransgas continue now to build gas-distributing pipe-line network in order to lead the gas directly to consumers.

Now we can say that to the beginning of 90s there had large-scale oil-gas complex appeared.

From the very foundation of this complex the scientists and engineering staff of our republic together with oil workers have worked out, mastered and put into production tremendous number of technical and technological inventions on oil extraction.

Complex and modern decision of scientific and technological problems allowed to receive substantial results on different stages of the oil complex development. First the priority was given to intensive methods of fields exploitation, such as selection of wells' optimum network, watering the seams by sewage, forcing of liquid selection and so on. Further, when the main fields have come to finishing exploitation stage, the main attention was paid to oil output rise, because traditional ways of oil fields exploitation don't provide even the half of oil output. Scientific-research institutes have devised more than 100 technologies of oil output increasing, which can give to 20% increase.

CONCLUSION

Present time one must over-think the development strategy of oil and gas industries of the Republic Bashkortostan, increase the works of environment keeping, widely introduce energy-saving technologies and determine the oil minimum output.

Powerful scientific and industrial potential of our republic favour to solve many of these problems. It allows to look in future with great optimism on the eve of XXI century.

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