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СПОНСОР НОМЕРА

22

Эмоции транзит не остановят

Политический конфликт Москвы и Таллина не приведет к серьезным экономическим последствиям



62

Вместо НПЗ в Китае

Как и с какой целью «Роснефть» может увеличить загрузку АНХК



121

ШЕЛЬФ

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The last segment

New bitumen produced by Nizhnekamsk Oil Processing Plant (NPZ) will find a new customer. If not in Tatarstan it may be in Kazakhstan.

In early summer, the first production line of air-blown asphalt unit at Nizhnekamsk oil processing plant of «TAIF» Group companies, put into operation in the middle of February, must reach its full annual capacity of 120 thousand tons. The bitumen unit allows solving simultaneously two problems: to increase the feedstock processing level and to meet in full Tatarstan demands for road and construction bitumen.

To tell the truth, the cost of high-quality Biturox bitumen produced by the Austrian technology is 5-7% higher than traditionally produced ones in Russia, and local road specialists don't like it. They will not rush to buy new generation bitumen without a single stimulus for construction of «long-playing» roads. Their colleagues from Kazakhstan are acting in contrast to them. In 2008, there will be initiated a project of a transit highway from Russia to China. This highway will be constructed under high requirements as per the quality and service life of pavements. In case Kazakhstan demands go over the capacity limits of the first production line, there may be installed the second reactor within half a year and the output of bitumen plant will increase up to 240 thousand tons per year, it was mentioned by «NiK» in «TAIF».

The demand for bitumen is in direct proportion to the volumes of construction, primarily of road engineering. In post Soviet period Russia did not make enough roads, especially, after liquidation of road reserves in 2000. According to the Ministry of Transport, the share of expenses for road facilities in 2005 decreased down to 1.1% of gross domestic product (GDP) – more than 2 times in comparison with 2000. In 2002-2004 the road facilities were financed through the budgets of Federal entities, on average not more than 30% of the needed volume, under-financing reaching approximately 225 billion rubles. The quality of existent roads has long become «the talk

of the town». Rosavtodor data indicates 56 % extension of federal highways which is only about 5% of all Russian roads (see «Fields of activity») have unsatisfactory coating strength, 37% don't meet the requirements of surface evenness standards. Except assets shortage this state of things was forced by inoperative system of building and operation of roads financing, when a contractor was interested not in durability of road surface but in its annual repair process. Thus, road specialists were not interested in bitumen quality, which was a by-product with a limited market for the most part of domestic Oil Processing Plants. In recent years the state of a motor-vehicle

transport system has become a serious obstacle for the economy development. In his message to Federal Assembly Vladimir Putin emphasized, that inefficient transportation system results in annual losses in the amount of more than 3% GNP, which was more than the aggregate expenses of the country for defense. Though, as the President put it, the federal budget road expenses were practically doubled since the year 2005, still it was not enough: In the current year he offered to allocate extra 100 billion rubles for the development of street and road network, as well as to develop new modern financing methods of construction and operation of roads. Building of

high-quality federal routes and reconstruction of highways is the absolute priority, as they are forming international transportation corridors North-South and Centre-Ural in the European part of Russia, as well as in directions providing realization of economic potential of the Far East and Siberia.

Global problems of highway engineering solution opportunity could move the owners of domestic oil processing plants to modernization of existing bitumen units and construction of new modern ones. This tendency fits well into «TAIF» plans of bitumen production development at Nizhnekamsk: new federal routes shall pass through Tatarstan territory, and at the same time it is planned to increase highway engineering within the Republic.

The false start

Production of road asphalt and construction bitumen is a natural component of the deep oil refining production net. Bitumen is produced of fuel oil, which nowadays makes more than 30% of marketable products of the most Russian oil processing plants. Such «deepening» is profitable for producers, as it provides for the added value: in April a ton of fuel oil cost approximately RUB 4,500-5,000 in the Volga region, a ton of road bitumen cost about 6,000, and construction bitumen – more than RUB 7,000. To tell the truth, only a negligible part of fuel oil (less than 10%) turns into bitumen, its production is limited by domestic demands.

The approximate annual demand in road bitumen in Tatarstan at present amounts to 200 thousand tons; five years ago it was lower – approximately 100 thousand tons. Nevertheless, at the beginning of the century there was an unoxidized road bitumen production unit (grades BNN 50/80 and BNN 80/120) with the annual capacity of 350 thousand tons among the priority projects

Field of activity

BY ROSAVTODOR DATA as of January 1, 2005, according to the current classification, there are 899.8 thousand km of motor roads in Russia, including 600.6 thousand km of general use roads (47.1 thousand km of federal roads and 553.5 thousand km of the roads under the RF regional administrations). Besides, today there are more than 550 thousand km of motor roads and streets in Russia, not included into the general use road network, though actually they fulfill their function. Among them nearly 145 thousand km represent the city street-road system.

of Nizhnekamsk oil processing plant (NNPZ), at that time under construction. The technology and plant capacity were determined by «Tataneft», until 2005 controlling Nizhnekamsk oil processing plant. The basis of technology is the method of vacuum distillation of fuel oil, produced from heavy high-sulphur oil in Tatarstan and Bashkortostan. This method was developed by Ufa Institute of petrochemical processing problems. «Tataneft» administration reported that the quality of unoxidized bitumen used everywhere in Europe might three times increase the life of road surface; and the unit capacity would provide 10% of Russian bitumen production.

The plant was put into operation in March, 2002, and this allowed the increase of the processing depth at Nizhnekamsk oil processing plant from 35% to 43%. Within

the first year 38 thousand tons of road bitumen was shipped to its consumers from Nizhnekamsk. However, after pompous reports and active advertising companies in spring of 2003, the bitumen complex was temporarily closed down. The «TAIF» Deputy Director General Vladimir Presnyakov, who took NNPZ with all its assets under his control (see «Everything is according to the plan» in «Oil and Capital (NiK)», № 12, 2005), explained the reason.

Production of road and construction bitumen is a natural component in the chain of deep oil refining.

He said, as far back as on the unit designing stage the oilmen made two fundamental mistakes, which became the reason of its inoperability.

First of all, it was designed for a very high capacity, not supported

Geography of Biturox

TODAY, there are 33 projects of bitumen units in the world realized based on Biturox technology. The two first units were built for Mobil and Wintershall in Germany in 1978. Nowadays Mobil operates 4 more bitumen units – two in Australia and two in the USA. In Europe bitumen by Biturox technology is produced in Holland, France, Poland, Austria and Czech Republic. Bitumen units of Porner Company enjoy wide popularity in Asia: three are working in India, three – in Iran, two – in Taiwan, by one – in Thailand and Myanma. Bitumen by Biturox technology is produced by oil processing plants on the territory of CIS in Baku, Turkmenbashi and Lisichansk, in Russia at Yaroslavl oil processing plant of «Slavneft» and at bitumen plant in Vakhrushevo near Chelyabinsk.



Main equipment of the new bitumen unit was installed at Nizhnekamsk NPZ by the end of the previous year

by real demand and lacking any possibility of regulating output volumes. Secondly, the chosen technology was strictly oriented at Tatarstan's heavy carbon oil, but this checkpoint came into a direct conflict with the requirements of the unit's main technological

processes, the basic complex of which started its operation at the end of 2002. Bitumen is the final segment in oil refining. At the same time, the competitive ability of NNPZ main products – motor and straight-run gasoline, diesel fuel, and condensed gases – di-

rectly depend on the quality of raw materials. Thus, the carbon oil which is rich in pyrobitumens and tars does not suit for their production. In its turn, the high-grade fuel oil, produced from the west Siberian and Volga region oil blends with sulfur content not exceeding 1.8%, does not suit for production of unoxidated bitumen.

Buying assets of «Nizhnekamsk NPZ» OJSC, the top-management of «TAIF» tried to exclude the unsuccessful bitumen unit. But it failed. Today the unit worth approximately 779 mln rubles of investments stands idle. The dismantling requires additional funds. Some attempts to reconstruct the plant: to decrease the capacity or adapt it for other purposes did not bring any results: the technology appeared to be very strict. According to the Presnyakov's opinion, this plant is nothing else but a copy of a vacuum unit, operating on AVT-7. Basically, in this capacity it might be operated, if there is raw material to load it. But there is no any.

By an Austrian recipe

At the same time the problem of fuel oil market output volumes decreasing (at present forming the part of NNPZ, the gasoline plant produces 1.9 mln tons per year) by its processing into products of the next process stage, among them bitumen, remained «one of the hottest».

As Vladimir Presnyakov told «NiK», different variants were discussed for bitumen production technology. However, the technology of simple oxidation of road tar, for example, developed by Bashkortstan researchers, did not allow technological process regulation, as well as did not guarantee homogeneity of the mixture, resulting in low quality of products. So, the preference was given to the technology of Biturox oxidized bitumen production of the Austrian company Porner. The company

BITUMEN MARKETING to a great extent depends on the organization of its shipment. Traditionally bitumen is shipped from NPZ to the consumers in special railway transportation tanks with steam «jackets». However, only big consumers, who have their own access roads with the required specialized elevated runways, may take in the train sets of cars. Transportation of bitumen to numerous minor users, fulfilling, for example, the current repair of roads is difficult in the provinces remote from the industrial centers. The properties of the material are those that its small packing, for example, into plastic sacks is not available. It requires the rigid containers.

All over the world the wooden timber pallets are used for this purpose. Bitumen, packed into three-layer sacks from high-tensile polymer films, able to keep the product defusing at any temperature, is placed on those pallets. Thus, builders can store bitumen, and producers – not depending on seasonal demands – can work all year round. However, such type of packing results in price increase by 25%, and that turns to be beyond their means.

At present, specialists from «TAIF» seek for any possibilities to provide an optimal version of similar packing. This opportunity appeared recently: small business enterprises organized production of modern polymer films on the territory of Special economic zone «Alabuga» on the basis of olefin polymers, produced by «Nizhnekamskneftekhim» and «Kazanorgsintez». At present, as «TAIF» informed «NiK», they are choosing the proper film strength.

If this problem is solved, the delivery of small volumes of bitumen to the most remote parts of roads will not be a problem: pallets with sacks might be transported by trucks. More over, they might be stored at the places of location. As a result, the bitumen production will have an additional opportunity to be in operation the whole year round.

provides high quality road bitumen and construction bitumen at the expense of adaptability of production: it is possible to regulate the technological process and temperature in the reactor, as well as bitumen composition during intervals, in compliance with the GOST requirements. In addition, this Austrian company provides the use of vacuum gas oil, available in sufficient quantities at NNPZ for the purposes of bitumen softening.

Rather serious argument in favor of Biturox was its record of service: within more than 25 years bitumen plants with this type of technology have already been efficiently operating worldwide. (see «Geography of Biturox»), including Germany, known by its roads high quality. Since 2001 bitumen in Russia has been manufactured by the Austrian technology at «Vakhrushevsky bitumen plant», built by the local administration in Chelyabinsk suburb. TNK-VR added Biturox into their operation as well; in 2004-2005 it started bitumen production at Ukraine

«LINOS» and NPZ in Yaroslavl. Specialists comment the quality of produced bitumen is very high, and there are no any problems with sales: Biturox bitumen is resistant to discomposing at extreme low or high temperatures, provides long-term service life of roads. The quality of asphalt, produced from this bitumen, allows the decrease of the depth of coating by road construction, the increase of service life at maximum traffic stream load.

«TAIF» bought from Porner the license for Austrian technology for bitumen unit utilization with the capacity of 240,000 tons per year at the beginning of 2006. By the end of the last year, the main equipment was installed, and in the middle of February the first production line was put into commercial operation and the first tons of bitumen BDU 100/130 were shipped.

The annual capacity of the first line is 120,000 tons. «TAIF» supposes it will meet the demand of Tatarstan in bitumen for 2007. At the same time all sup-

ply and management systems of NNPZ bitumen unit are designed with a double capacity. Upon the growth of demand, it is possible to install the second reactor into the technological process within 4-5 months. The second reactor will also provide guarantee for the process in the case of one of the reactors repair. Feedstock for loading these capacities is more than enough available.

Demand is a great issue

The total cost of the realized project amounted to 460 million RUB. The payback term is 2.1 years, provided that beginning from the third month of operation (since June) the plant will be loaded by 100%. However, it turned out, that the final condition was not easy to fulfill because the demand was limited. In April only 27% of the plant capacity was operating, and 54% – in May, when a construction season began. Consumers complained that the new product is 5-7% more expensive than bitumen bought at present at Ufa, Perm, Nizhniy Novgorod and

Syzran NPZ. Road specialists were not accustomed to pay for quality. Besides, evil tongues say that it is uneconomic for road specialists to use the new generation bitumen, providing long-term service life of paving; they are used «to roll» into asphalt some vast budget sums of money annually.

At the same time Byelorussia and, especially Kazakhstan companies show a certain interest in Nizhnekamsk bitumen. As Vladimir Presnyakov told, those countries expressed readiness to take the whole production of the first stage and in some cases even more. In autumn 2006 during his visit to Kazan, Danial Akhmedov-Prime minister of Kazakhstan at that time – offered the Tatarstan Government to establish a joint-venture for the project of building the motor-way Uralsk-Kyzylorda-Shymkent-Khorgos (at the China border), the passage Uralsk-Khorgos: «You have high-grade bitumen and the required engineering, but we have funds». The start of the road building is planned for 2008. It will link by the shortest route the West Kazakhstan with China and, correspondingly, a number of close Russian regions.

At present the demand of Kazakhstan in road asphalt is valued approximately in 500,000 tons per year; at the same time, as in 2006, only 65,000 tons was pro-

duced in the Republic, the rest volume was imported. In the nearest future Kazakhstan will officially determine the desired purchase amounts at NNPZ: if the demand is high enough, Nizhnekamsk is ready to build the second reactor. It is especially important that the Kazakhs are ready to buy bitumen all year round. In this case bitumen unit will be operated not only during the season (from April to November) but permanently, and this will change its economy fundamentally.

At the same time «TAIF» considers its main task is to provide road specialists in Tatarstan with high-grade bitumen. In connection with the latest statements of the President, bitumen might become a need for building of transit segment on federal routes, which will pass through the territory of the Republic. To make up the clear production program taking into account the potential demand (inside and outside), Nizhnekamsk NPZ must know the future plans of road builders. There is a main thing allowing to meet their requirements- huge volumes of raw stock and availability to develop the production.

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