

Innovation

One of the priorities for Gazprom Neft's innovative development is technology that ensures the strategic goals of increasing production and enhancing the technological efficiency of oil refining. The Company has introduced a long-term technological planning system that identifies long-term technological challenges and the solutions needed to deal with them.

INNOVATIONS IN EXPLORATION AND PRODUCTION

Gazprom Neft has employed a Technological Strategy for Exploration and Development since 2014 that summarises the Company's technological challenges. The Technology Strategy consists of nine long-term technological development programmes that include projects with specific implementation periods and the anticipated results.

The Exploration and Production Unit launched five long-term programmes in 2015 and plans to launch the other four programmes in 2016. The most important decisions under the Strategy are adopted by the Management Committee chaired by the Company's first deputy CEO. The Technologies Committee handles the monitoring of project implementation.

The main projects to be implemented under the Technological Strategy for Exploration and Development are: the inclusion of hard-to-recover and unconventional reserves in development work, chemical-based enhanced oil recovery methods, the utilisation of associated petroleum gas, the substitution of technological equipment imports and the development of integrated conceptual design tools.

INCLUSION OF UNCONVENTIONAL RESERVES IN DEVELOPMENT WORK AND HARD-TO-RECOVER RESERVES //

RESULTS OF 2015: Production using high-tech wells (horizontal wells, including multi-stage hydraulic fracturing) exceeded 11 million TOE. The first stage of the study of the Bazhenov formation at the South Priobskoye field was completed and confirmed the existence of mobile oil reserves. After hydraulic fracturing operations were performed at all the wells, a flow of hydrocarbons was obtained with varying intensity. In addition to Gazpromneft-STC, the other participants in the programme are the Engineering Centre of the Moscow Institute of Physics and Technology (State University), Lomonosov Moscow State University, Gubkin Russian State University of Oil and Gas, and Skolkovo Institute of Science and Technology.

At the Priobskoye field, LLC Gazpromneft-Khantos has introduced innovative non-spherical hydraulic fracturing technology that eliminates restrictions on the number of stages in a single bore. This technology will enable the Company to develop additional hard-to-recover reserves.

The drilling of the first horizontal well has been completed at the Novy Port oil and gas condensate field with horizontal shafts of 1,000 metres. This marks the first time a dual well has been drilled in Arctic conditions. The drilling of extra-long dual wells intensifies hydrocarbon production while simultaneously reducing infrastructure costs.

SERGEY DOKTOR

CEO
LLC Gazpromneft-Khantos



“ In 2015, Gazpromneft-Khantos was faced with a serious technological challenge at the South Priobskoye field. The difficult geological structure of perspective boundary deposits of the asset and, as a result, the extremely low reservoir properties of the oil containing reservoir rocks meant the traditional approaches to the development of such reserves would be economically inefficient. Taking into account the projected growth in the proportion of this category of reserves in the enterprise's annual production to 80% by 2018, only the selection and introduction of the latest drilling and extraction technologies combined with the maximum cost reduction in related materials and equipment may maintain the asset's current level of production in an economically efficient manner. Utilising the specialised functions of the Upstream Division, we have formed a long-term strategy to search for and test the latest oil production methods and technologies from low-permeability reservoirs, which will not only result in the individual selection of the best method for developing the boundaries of the Priobskoye asset's sections from an economic standpoint and a scientifically substantiated approach for selecting the production method for fields with difficult geological conditions”.

CHEMICAL-BASED ENHANCED OIL RECOVERY METHODS //

RESULTS OF 2015: In the second half of 2015, Salym Petroleum Development completed the installation of equipment and began pumping into injection wells as part of a pilot alkaline-surfactant-polymer (ASP) flooding project. ASP has the potential to increase oil yield through the process of chemically flooding a reservoir with a ternary mixture (consisting of anionic surfactant polymers, soda and polymer).

FLOODING METHOD

One method for enhancing oil recovery efficiency that is commonly used in Russia is flooding where water is employed as a displacing agent. Pumped into the subsoil resources via special injection wells, the water pushes the oil towards the production wells acting as a kind of piston.

The efficiency of the process can be enhanced additionally by pumping special solutions into the formation, which include surfactants that flush away the residual oil by reducing surface tension at the boundaries with the rock and the water as well as a thickening agent – a polymer that allows for levelling out the injection front and increasing the sweep.

UTILISATION OF ASSOCIATED PETROLEUM GAS //

RESULTS OF 2015: In September 2015, Gazprom Neft and SIBUR launched the commercial operation of the South Priobskoye Gas Processing Plant with production capacity of more than 900 million m³ of associated petroleum gas. Due to the launch of the new production facility, the utilisation of APG produced at the South Priobskoye field reached the required level of 95%, thus making it possible to significantly increase the economic efficiency of this asset's development.

The Company has successfully completed the pilot testing of innovative soft steam reforming technology to process associated petroleum gas developed by the Boreskov Catalysis Institute of the Siberian Branch of the Russian Academy of Sciences. The new technology is recommended for introduction at the Company's enterprises in order to enhance the utilisation of associated petroleum gas at small and remote fields.

GAS TREATMENT TECHNOLOGY

Associated petroleum gas is an integral component of oil production at almost all fields. In order to increase the APG usage level, Gazprom Neft is implementing a number of projects that will make it possible to efficiently process it directly in the regions of production. One of the most commonly used gas treatment technologies is the low-temperature separation of APG into natural gas liquids (NGL), dry stripped gas and natural petrol. The petrol can then be used as fuel or gas and pumped into a pipeline, while NGL is used as a raw material for the petrochemical industry.

However, the construction of a gas processing plant and infrastructure to transport NGL is a project that would only be economically justified if significant volumes of APG are utilised. Cost-effective processing methods such as soft steam reforming technology are needed for small amounts of raw materials. Such technology makes it possible to convert the NGL contained in APG into methane and obtain a gas that is suitable for use in the power industry and gas pipeline transportation.

SUBSTITUTION OF TECHNOLOGICAL EQUIPMENT IMPORTS //

RESULTS OF 2015: Gazpromneft-NNG has successfully completed the first stage of testing at the Vyngapurovskoye field on the first Russian rotary-controlled system produced by OJSC Elektropribor State Research Centre Concern.

INTEGRATED CONCEPTUAL DESIGN TOOLS //

RESULTS OF 2015: A software module called "Surface Infrastructure Development" is being developed and its introduction will help to improve the economic efficiency of projects by optimising the infrastructure development of multiple well platforms and in-field communications.