

Technologies for the efficient development of small fields. Nestro-TEC Project

The NESTRO-TEC project is being implemented as part of the Technological Leadership strategic focus in order to ensure efficient oil production with minimum capital and operating costs, increase mobility through block-modular manufacturing of site equipment, improve energy efficiency, and introduce new product preparation technologies.

The NESTRO-TEC project includes a set of technological initiatives that aim to develop mobile technological solutions and equipment as well as reduce the cost of existing components, which helps to obtain finished products at the field trial operation stage with the ability to influence the productivity of the technological operations that are being performed.

OBJECTIVES OF THE NESTRO-TEC INNOVATIVE PROJECT:

- ▶ Develop preliminary water discharge mobile units at fields during the early stage of development
- ▶ Generate power using oil instead of diesel fuel
- ▶ Reduce capital and operating costs on preparing APG for power generation
- ▶ Reduce APG flaring
- ▶ Reduce specific electricity costs for the extraction of oil-containing liquids
- ▶ Reduce the operating costs of energy-consuming equipment
- ▶ Ensure better planning of repair operations with surface equipment
- ▶ Efficiently operate wells with a complex profile
- ▶ Reduce capital expenses on field development

The NESTRO-TEC project is already introducing and replicating technologies that were developed in 2016–2018, including the following:

- ▶ The preliminary produced water discharge unit for small fields (NESTRO-KSI/Kickoff Surface Infrastructure) is a modular preliminary water discharge unit that is located directly at the field during pilot operation and can be quickly relocated by road or rail (ZARUBEZHNEFT-Dobycha Samara LLC is operating it with success).
- ▶ A Russian-produced power plant that runs on oil of all categories that consists of a diesel power plant

manufactured by Kolomna Locomotive Works OJSC and Zvezda-Energetika JSC and is equipped with fuel equipment designed by Zarubezhneft for operation on category 3 oil. Pilot tests have been completed. The project has been approved for replication. The Company plans to purchase another power plant and put it into operation in 2021.

- ▶ The Oil and Gas Enterprise Energy Efficiency Analytical Information System (OGEEE AIS) has been introduced at JC RUSVIETPETRO; replication is under way at ZARUBEZHNEFT-Dobycha Kharyaga.
- ▶ The Oilfield Equipment Integrity Management Information System (OEIM IS) is an automated system for oil production, treatment, and transportation infrastructure facilities. In 2020, the Company continued to develop the functionality of the OEIM IS and AWS-mechanics taking into account the needs of production facilities. The Metrologist AWS module was introduced to optimize the maintenance of metrological equipment as well as instrumentation and automation. In 2021, the Company plans to implement the next AWS-power module, which will ensure information systems fully encompass the entire equipment maintenance cycle.

In addition, as part of the project, Zarubezhneft is implementing a R&D project called Creation of Catalytic APG Purification from Hydrogen Sulfide in 2020–2022. The catalytic APG purification technology is based on gas purification from sulfur-containing components with the use of catalysts developed in Russia (Lomonosov Moscow State University). It can be implemented at any isolated field and ensures the purification of the whole volume of APG. It is introduced within a year when the decision is made, and has low capital and operating costs.

Pilot testing was completed on a mobile small-sized unit that purifies gas from hydrogen sulfide at the Kharyaga oilfield. A decision by the Scientific and Technical Council of the Russian Federation approved the results and endorsed the start of the 5th stage of a R&D contract for the development of the design documentation for the modular industrial unit for APG catalytic purification from hydrogen sulfide and mercaptans for JC RUSVIETPETRO at the Severno-Khosedayuskoye field.