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Severneftegazprom Reduces Operating Expenses by Using PIPESIM Software

Gas production network model used to identify hydrate-forming wells

CHALLENGE
Identify wells not subject to formation of gas hydrates; reduce or eliminate methanol injection for those wells.

SOLUTION
Use PIPESIM* production system analysis software to tune the field gas production network model and identify target wells.

RESULTS
Identified nearly 100 wells not subject to gas hydrate formation; reduced methanol consumption by 30% per day; significantly reduced operating expenses.

> "Usage of PIPESIM helps our production department specialists to target practical tasks of field development optimization. As a result, we improve the economic effectiveness of our company and increase the profit of company shareholders. We're fully satisfied by our collaboration with Schlumberger Information Solutions and look forward to continuing it."
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> **Alexey Krutoi**
> **Chief of Department of Geology, Field Development, and Licensing Severneftegazprom**

Alexey Krutoi, Severneftegazprom Chief of Department of Geology, Field Development, and Licensing, uses PIPESIM software to make critical decisions for Severneftegazprom assets.

Joint stock company Severneftegazprom, with stakeholders Gazprom, BASF, and E.On, is a base supplier of natural gas for first stage of the Nord Stream global pipeline project, which starts operating in 2011. The company produces from the Cenomanian reservoir of the Yuzhno-Russkoe field. Founded in 2007, Severneftegazprom produces 27 billion m^3/year.

Extraction and transportation of gas is complicated by gas hydrate formation. Without preventive action, these gas hydrates can cause flow issues and affect company operations.

Severneftegazprom routinely injects methanol into pipelines and every well annulus to eliminate gas hydrates. In addition to the significant cost of methanol itself, there are complications and extra costs related to transporting this chemical to the field by seasonal ferry.

To achieve field development cost-effectiveness, the company requires accurate well models, correctly tuned gas production network models, and the ability to determine which wells require methanol injection.

Severneftegazprom selected the Schlumberger PIPESIM solution for automated field development analysis. It initiated a joint project with Schlumberger to create and analyze the PIPESIM field model.

PIPESIM software is a steady-state, multiphase flow simulator for the design and diagnostic analysis of oil and gas production systems. Software tools model multiphase flow from the reservoir to the wellhead. PIPESIM software also analyzes flowline and surface facility performance to generate comprehensive production system analysis. Using the simulation approach helped to optimize well regimes, to decrease daily volumes of methanol injection, and to improve quality control of measured data from wells and well test results.

PIPESIM software was used to build models of all the production wells and the pipeline network, from downhole to processing plant input. Data sources included well test results, pressure/volume/temperature data, daily production reports, and data from the SCADA system. A comparison of model forecasts against observed data determined that the model was of excellent quality.

Using the proven field model, the joint team of Severneftegazprom and Schlumberger engineers analyzed well operating regimes to estimate the rate of gas hydrate formation. The operations detected more than 100 wells with hydrate-free regimes, which resulted in a series of workovers to optimize methanol use. Overall methanol use was decreased by 30%—several hundred tons between April and September 2010.

The PIPESIM field model will be used as part of the integrated model of the field. The integrated model will enable Severneftegazprom to optimally manage the gas production network over the long term. Combining the reservoir model in ECLIPSE* reservoir simulation software with the PIPESIM gas producing network model using Avocet* Integrated Asset Modeler technology will allow Severneftegazprom to make precise forecasts, calculate different field development scenarios quickly, optimize well operating regimes, decrease OPEX and CAPEX, and prolong the life cycle of the field.

The PIPESIM model helped to optimize Yuzhno-Russkoe field operations. (The field name is written on the sign.)

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