Case Study

Honeywell Improves Gasoline Quality at LUKOIL-Nizhegorodnefteorgsintez Refinery

“Honeywell’s Open Blend Property Control solution optimizes gasoline composition to achieve blend quality in real-time”

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Background
LUKOIL-Nizhegorodnefteorgsintez, part of LUKOIL PJSC, is a leading fuel/lube oil refinery in Russia with an annual production capacity of 17 million tons. Located in Kstovo, the plant gets its raw material for production from a blend of West Siberian, Perm, and Tatar crudes. The refinery makes over 70 product brands. Up to 800 tank cars of oil products are shipped daily, up to 350,000 tons a month are shipped via pipelines, and up to 1 million tons are shipped via tanker during the navigation period. The refinery exports its products to the North-Western European markets.

Challenge
LUKOIL-Nizhegorodnefteorgsintez management has set a goal to improve its marketable gasoline production efficiency and reliability, and to increase profit through process automation and optimization. Blending components have different prices and properties, while marketable gasoline (component blends) must meet strict GOST (gosudarstvenny standart) quality standards.

Solution
The key functionality of blending control and optimization is to calculate and automatically apply an optimal blending recipe according to the selected criteria. To this end, LUKOIL selected Honeywell’s Open Blend Property Control (OpenBPC) solution, a real-time blending optimization solution.

LUKOIL’s OpenBPC implementation project started in 2013 and took six months to complete. The project had several distinct phases, including:
- Development and approval of the functional design
- System configuration and development of blending models
- System deployment on site
- Training
- Integration with the existing information systems
- Pilot implementation
- Full implementation.

LUKOIL ultimately implemented a real-time blending recipe optimization system, which automatically controls the process via the refinery’s Distributed Control System (DCS) and reliably produces gasoline of a preset quality at a minimum cost.

Benefits
Honeywell’s OpenBPC solution enabled LUKOIL to realize a number of crucial operational and business benefits. These included:
- Reduced costs for expensive high-octane components such as Methyl Tertiary Butyl Ether (MTBE)
- Lowered excessive octane levels in standard-grade marketable gasoline
- Increased output of specific products to achieve monthly production targets or satisfy growing demand
- Improved product quality and reduced rebleans.
LUKOIL management was very satisfied with the results achieved through the Honeywell system. Capacity increases and the startup of new process units are currently being implemented at the refinery, which requires updating of the blending model and the system configuration. As such, Honeywell is updating the OpenBPC system with even more sophisticated and detailed blending models. These updates will enable broader application of the system's capabilities for even greater impact and customer benefits.

**System Functionality**

The advantages of the OpenBPC solution are its comprehensive functionality and flexible configuration. For LUKOIL, an important factor was also the availability of a local Honeywell team which ensured successful implementation of the solution.

Key OpenBPC functions include:

- Flow analyzer data validation, consideration and compensation of analyzer dynamics
- Model compensation calculation
- Component and product stream quality data monitoring
- Status monitoring of blends in progress
- Real-time blending data collection for optimal control computation
- Optimization of current recipes
- Automated transfer of optimization results back to the blend unit control system.

The system receives process flows and quality data from several sources, including the flow analyzer, laboratory measurements, the recipe database, manually-entered values, and model predictions.

When configuring the blending objective function, OpenBPC has a number of preset objective functions, which can be combined to obtain the desired blending optimization goal. They include Property Control and Minimum Cost. Where two or more objective functions are used, the system optimizes the blending in several consecutive stages, with the blending objective functions optimized at each stage. The following stages retain the optimum achieved at the previous stage, using any degrees of freedom remaining for optimization of the next objective function.

Lastly, the OpenBPC solution provided improved display call-up and process parameters update rate, as well as improved controller loading by 35 percent with the C300 controller upgrade.

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**For More Information**

To learn more about how Honeywell’s OpenBPC solution can improve performance, visit our website [www.honeywellprocess.com](http://www.honeywellprocess.com) or contact your Honeywell account manager.

**Honeywell Process Solutions**

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