

# Meeting Siberian Oilfield's Challenges

VERKH-TARSK OIL FIELD, SIBERIA – Generating electricity using field-gas-fired engines at this oil field presents a triple challenge – low quality gas, wide variations in weather and a remote location, without roads or power lines, far from a repair shop or service center.

It's a challenge that Dresser Waukesha and its Russian distributor Energoteh successfully met with the installation of two VHP9500GSI Enginator® gensets. The success of this project is all the more gratifying because the Waukesha units were installed after power generating units supplied by several competing manufacturers were unable to perform at expected levels.

The story begins around 1970, when the Verkh-Tarsk field was discovered. Commercial extraction of oil by OJSC Novosibirskneftegas began in 2000. In the first several years, the field produced modest amounts of oil, but more recently, output has grown to more than 6 million barrels annually.

*Waukesha engines' reliability - and ability - to operate on widely varying fuel quality makes them ideally suited to remote oil field power generation applications.*



## Location

Verkh-Tarsk oilfield, western Siberia

## Engines

Two Waukesha VHP9500 Enginators® rated at 1.1 MW each

## Story

Two Waukesha Enginators have been the only units able to produce rated output operating on low quality associated gas for this on-site oilfield power generation installation.

It is just one of many fields in this resource-rich country that have helped to fuel Russia's recent economic expansion.

With an estimated 224 million barrels of recoverable oil (32 million tons), the Verkh-Tarsk field is one of the largest in the northern Novosibirsk region. This is western Siberia – a remote, rugged land with cold winters with recorded lows of -40°F (-40° C) and hot, dry summers with recorded highs of 100°F (40°C). It lies several hundred miles east of Moscow at on latitude slightly north of the Russian capital. A 110 mile (180 km) pipeline is needed to transport the oil to the nearest refinery at Barabinsk.

## Case Study #1420, Siberian Oilfields

Initially, power for the site was provided by five diesel gensets rated at 1 MW each. As the rate of oil extraction increased, so did the amount of associated gas that was recovered with the oil. Site management saw an opportunity to put the associated gas to work to generate electricity for the site. Up to that point, the associated gas had been unused and was simply being burned off into the atmosphere.

The decision was made to install gas-engine-driven generators, despite the fact that gas quality was very low, with a detonation index of just WKI® 53.

Between 2003 and 2005, orders were placed three times for gas-engine gensets, twice from CAT and once from Jenbacher to meet the growing need for power at the site. However, once installed, none of the units could demonstrate stable operation at their rated power outputs due to the low quality of the gas. As more pumps were added to move increasing amounts of oil, the operations at Verkh-Tarsk were faced with an “energy gap” – a need for power greater than their plant could supply.

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— Kirill Kryuchkov,  
managing director, Energoteh

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This time, when the specifications were drawn up for additional power generation units, the request for proposals specifically called for new units that would run on associated gas from the site, without power loss.

Enter the Energoteh team, the Moscow-based engineering firm that is one of Dresser Waukesha’s distributors in Russia. Energoteh presented a proposal that specified Waukesha VHP® engines. A guarantee that the units would perform at rated power levels, along with a relatively short lead time from order through installation, convinced Novosibirskneftegas to award the project to Energoteh.

“We were confident that we could meet the terms of the contract,” said Kirill Kryuchkov, Energoteh’s managing director. “The Waukesha VHP engines have time-tested technology that made them ideal for this project.”

“These engines were developed expressly for operation on heavy fuels such as associated petroleum gas,” he said. “They are distinguished by their ability to operate steadily on a wide range of gaseous fuels.”

In addition, Kryuchkov pointed out, the engines are designed so that they can be modified from original operating specifications in the event that gas composition changes after the engine is commissioned and in operation. The Waukesha’s reputation for high reliability and longevity was another important consideration because of Verkh-Tarsk’s remote location.

In addition to supplying the engines, Energoteh was responsible for engineering the system that integrated the new gensets into the onsite utility and commissioning the engines once they were installed.

Both units were successfully started up within 10 weeks’ time. Most important, when the engines were tested, each delivered the 1.1 MW of power that Dresser Waukesha and Energoteh promised, despite the poor gas quality.

The success of these two Waukesha units prompted the site engineers to turn to Waukesha again, purchasing three of the company’s new APG3000 units.

*Waukesha Enginator® gensets were installed at Verkh-Tarsk in the bitter cold of a Siberian winter*

