ORBCOMM®

WHERE DATA DRIVES DECISIONS

ORBCOMM and Numerica deliver satellite-enabled IoT for optimal performance in oil and gas field operations

Petroleum producers from around the globe realize decreased costs and increased efficiencies using satellite-cellular dual-mode IoT solution.

Overview

The oil and gas industry has a significant influence on the global economy with over $4.2 trillion USD in revenue and double-digit compound annual growth rates. For oil producers, technology is playing a key role in ensuring petroleum companies can keep pace with ever-changing demand and increased regulatory requirements.

Since 2009, Numerica and ORBCOMM® have helped digitalize the petroleum industry with industrial IoT applications, hardware, and services. Numerica's WellMonitor Supervisory Control and Data Acquisition (SCADA) solution allows petroleum producers to remotely monitor and control artificial lift systems, optimize oil production, increase equipment lifespans, help meet or exceed regulatory requirements and save on labor and transportation costs.

The Challenge

Oil producers face a wide range of challenges. Petroleum production is expensive, complex, and requires coordination and precision to be profitable. Plus, the petroleum industry is becoming increasingly regulated as environmental initiatives take shape. One of the keys to success is managing costs throughout petroleum production.

For Farid Majana, Real Time Operations Manager at Numerica, this can be accomplished by IoT solutions with connectivity that can be trusted.

"By the very nature of the industry, oil and gas operations are performed in remote, rugged, and environmentally challenging environments. Traditionally, petroleum companies have relied on direct hands-on management of wells by engineers. This requires driving long distances or even boarding ships so engineers can directly observe the status and performance of wells that are operating in widely distributed geographical areas. The operating conditions for wells can change rapidly, yet data is not easy to access since reliable connectivity in remote areas is often limited or unavailable. To remain competitive and optimize production, petroleum companies require more reliable and secure connectivity," says Majana.

The Solution

Numerica's WellMonitor leverages ORBCOMM technology—including dual-mode satellite-cellular services and hardware—to enable its customers to connect to well pumps even when cellular coverage is unavailable. Petroleum industry engineers can access data—including well motor frequency, voltage, current, temperature, intake and discharge pressures, vibrations and more—via a web browser or a smartphone app, making remote field operations more accessible. Plus, it allows engineers to remotely control pump processes so they can react to changing conditions faster without needing to send personnel to a site. WellMonitor can be used to help with remote troubleshooting as well, providing alerts before problems become mission-critical and reducing the time it takes to address issues for improved efficiency, utilization, and production. WellMonitor uses AI to automatically detect unwanted operational events such as the presence of gas at an early stage, which allows the necessary corrective actions to avoid production losses and pump damage.

With ORBCOMM's smart programmable terminals and flexible satellite services, data can be processed at the edge using apps that run directly on the terminals. This can decrease the cost of satellite connectivity as users can choose what specific data is sent—and when— rather than having all the data transmitted to WellMonitor.

ORBCOMM's two-way communication capabilities enable engineers to remotely manage maintenance and operational settings for up to 15 devices per WellMonitor system, reducing the time and cost associated with traveling to well locations. This includes motor frequency changes and turning well pumps and power generators on or off.

WellMonitor provides live operational calculations including oil production and pump performance that engineers can use to ensure optimal output from each well and resolve issues remotely.

"WellMonitor includes an accessible, user-friendly application. It provides full access to data across well operations and provides the ability to start and stop well pumps, change running frequency for pumps and set optimal operating ranges for pumps and generators. The system logs all changes that are made in the field or remotely. The WellMonitor application also sends alerts when equipment is operating outside of set operating ranges," says Majana.

Numerica WellMonitor Benefits

- Improves oil production through efficient pumping system operations.

- Provides operating data to identify optimization opportunities.

- Increases the lifespan of well pumps, generators and other surface equipment.

- Accelerates issue resolution due to immediate notification of any issues.

- Decreases maintenance spending by eliminating the need for maintenance workers to visit each well to determine operating health.

- Improves remote operational visibility with reliable dual-mode connectivity.

Results

Deployed across more than 10 countries in the Middle East, Africa and Latin America, Numerica's WellMonitor has been delivering results for well over a decade and is used to monitor over 1,000 wells worldwide.

"Our plug and play solution makes deployment easy. As a low-size, weight and power solution that works globally and can be installed anywhere in the world to control up to 15 devices in the field per communication system, it can be tailored to unique client requirements," says Majana.

CUSTOMER SUCCESS STORY:

Hocol: "WellMonitor has delivered immediate results for our business"

Numerica customer Hocol, a company with over three decades of experience in oil and gas operations, has realized remarkable results for their operations with WellMonitor. Listen to what Javier Vergara, Hocol Production Technology Engineer, has to say about their experience with Numerica.

"WellMonitor has delivered immediate results for our business. In fact, it enabled Hocol SA to detect shutdowns that would have resulted in over five hours of deferred oil production. Over a period of only three months, we identified stoppages ten times, and we were able to resolve these outages immediately, so oil production continued," says Vergara.

"WellMonitor also allows us to implement aggressive production optimization strategies. We safely maintain minimum pump intake pressures even with variable hydrocarbon viscosity changes due to temperature fluctuations during both daylight and nighttime hours.

"Using WellMonitor, we created a new human-machine interface (HMI) and dashboard that helped us identify production optimization opportunities. We are now finding the ideal balance between how deep the pump's intake is and the midpoint of perforations and tracking opportunities to deepen electric submersible pumps (ESPs) for better production gains. This helps us manage the ESP's lifespan, manage surface-level wellhead pressure readings and calculate annular pressure to ensure proper submergence levels, which helps maximize production while protecting ESP equipment. These data points provide our well engineers with better insights to make smarter decisions and keep systems running smoothly and safely.

"Our measurable results from using Numerica's WellMonitor include the startup, monitoring and surveillance of two workovers that allowed Hocol to extend the life of two well operations through a capitalized expenditure of $2.6 million. This resulted in incremental oil production of 365 barrels per day and reserves of 300,000 barrels while maintaining quality, health, safety, and environment standards" says Vergara.

Learn more about our partnership opportunities:

Email: **info@ORBCOMM.com** | Call: **1-800-ORBCOMM**

Visit our website **www.ORBCOMM.com**

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ORBCOMM is a pioneer in IoT technology, empowering customers with insight to make data-driven decisions that help them optimize their operations, maximize profitability and build a more sustainable future. With 30 years of experience and the most comprehensive solution portfolio in the industry, ORBCOMM enables the management of over a million assets worldwide for a diverse customer base spanning transportation, supply chain, heavy equipment, maritime, natural resources and government. For more information about how ORBCOMM is driving the evolution of industry through the power of data, visit www.orbcomm.com.

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