Remote Wellhead Monitoring

EXECUTIVE SUMMARY

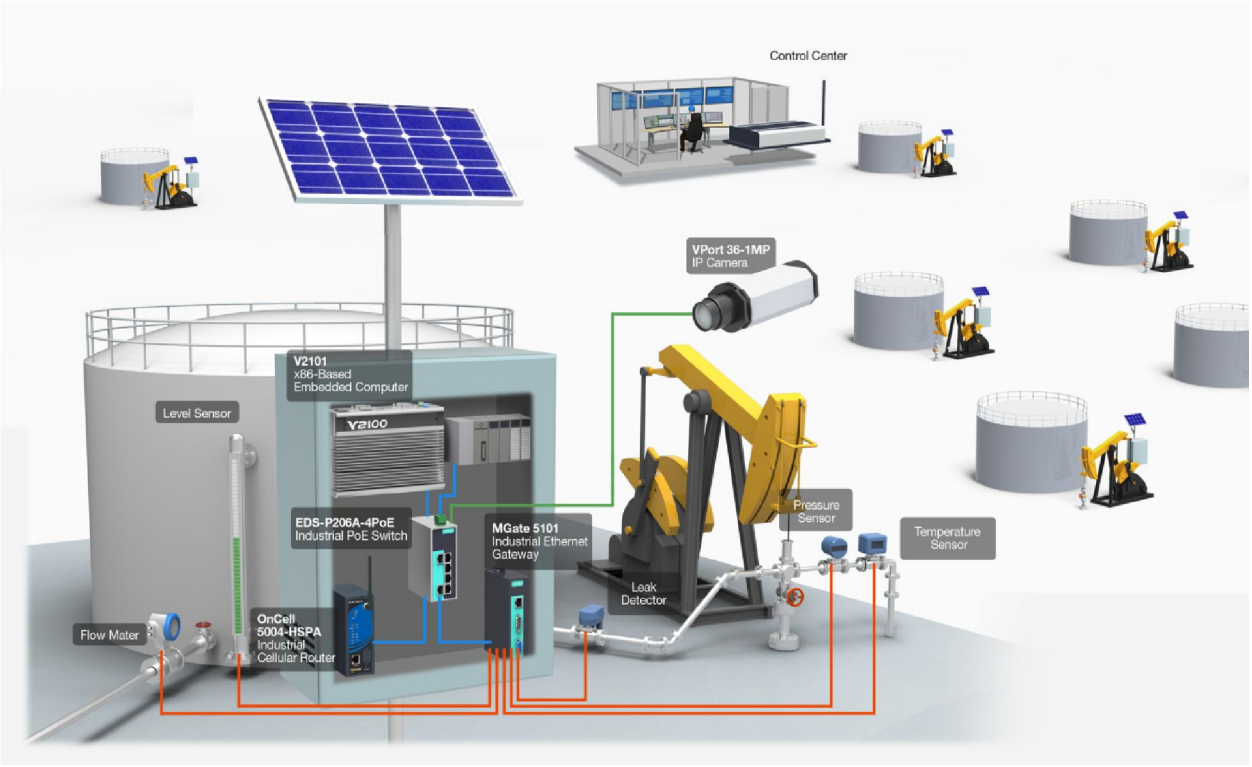
Terra Ferma was challenged with bringing remote video surveillance and data acquisition to multiple wellheads scattered throughout the cold, harsh Rocky Mountains of the Central United States. They required asset management, remote control capabilities, data logging for remote surveillance, and alarm notifications. Terra Ferma turned to Moxa to meet their networking demands with an enterprise solution spanning in-the-field sensors at the very edge of the network all the way up to remote data acquisition and SCADA integration.

> *"Because of the mission-critical nature of our systems, we rely only on best-of-breed in technology. For that reason, we have complete confidence in Moxa components to protect our customers and our reputation."*
>
> - Dennis Roark, President of Terra Ferma

THE CHALLENGE

Each wellhead was equipped with various sensors and meters that needed to be monitored and controlled from a central HMI, often miles away from the assets in the field. Redundant solar and wind generators were installed at each wellhead to support the electrical needs of the pump-stations, temperature meters, cameras, and cellular modules. In addition to asset management and remote control capabilities, data logging for remote surveillance and alarm notifications was a key demand from the customer. Terra Ferma's solution needed to be power efficient, reliable, and capable of supporting high-bandwidth data-feeds.

They needed a multi-link cellular connection to a central server that sustained reliable and redundant monitoring and control of flow meters, temperature sensors, power supply, and event-logging; including video and image files. This open-standard network needed to interface with the existing SCADA and proprietary network management software.



Extending enterprise IT communications from the corporate offices out to remote and harsh industrial environments.

THE SOLUTION

Requiring full integration of SCADA with remote monitoring capabilities, Terra Ferma searched out Moxa to meet their networking demands. The decision was an easy one; Moxa's vertically-integrated oil and gas products provide a variety of end-to-end solutions that all feature strong certifications for harsh environments, low power consumption, and also the industry's only UL Class 1, Division 2 IP video camera.

Twenty wellhead applications link directly to a remote central server and control center, allowing for remote operations control, surveillance, and systems diagnostics from miles (or even continents) away. Field technicians and site managers are notified of critical wellhead events by SMS or email, and may access remote video feeds and sensor readings from the field using any web enabled smartphone, laptop, or tablet. The legacy SCADA is fully integrated with the customer's industry standard flow meters, sensors and IP cameras over both wireless and serial links, allowing for detailed monitoring of site production. Detailed real-time overviews of injection, pipeline, or water and fracturing fluid processes are all available. At the control center, a central cellular modem receives feeds from a network of UL Class 1, Division 2 IP cameras, automatically storing event-driven images and video feed to the network server.

Terra Ferma and Moxa, along with MSI Tec, are extending enterprise IT communications from the corporate offices out to the most remote and harsh industrial environments the oil and gas industries have to face. From in-the-field sensors at the very edge of the network all the way up to remote data acquisition and SCADA integration, Terra Ferma and Moxa are enabling the digital oil field across the globe, pushing industrialized Ethernet, wireless communications, embedded computing, and industrialized IP video out to the harshest extremes the industry has to offer.

RESULTS

Twenty wellheads kitted out with a full array of automated data logging, monitoring, and control devices linked to a miles-distant central server and control room, where remote operations surveillance, system diagnostics, and control routines are collected and acted upon. Live, event-triggered video feeds and complete reports on all available sensor data are accessible using over wired or wireless Ethernet, and may be easily accessed using smart phones, tablets, or laptops.

PACs serve as strongly intelligent RTUs, logging real time pressure, flow-rate, and temperature data, and storing it for analysis of historical trends. These PACs are capable of pushing emergency alerts to system operators over SMS and/or email whenever production anomalies occur. At the control center, a central cellular modem monitors a network of rugged UL Class 1, Division 2 IP cameras, automatically storing images and video feed to the network server and pushing video feeds onto the control center's main HMI whenever certain event triggers are logged. Terra Ferma and Moxa were able to integrate this vertically integrated remote monitoring and control system with the legacy SCADA system already installed on the site, giving the customer significant savings on deployment costs, both in terms of infrastructure outlay and system downtime.

ABOUT MOXA

Moxa is a leading manufacturer of industrial networking, computing, and automation solutions. With over 25 years of industry experience, Moxa has connected more than 30 million devices worldwide and has a distribution and service network that reaches customers in more than 70 countries. Moxa delivers lasting business value by empowering industry with reliable networks and sincere service for automation systems.

ABOUT THE INDUSTRIAL INTERNET CONSORTIUM

Moxa, Inc. as been a member of the Industrial Internet Consortium (IIC) since May, 2014. The Industrial Internet Consortium is a global public-private organization of over 160 members, formed to accelerate the development, adoption and wide-spread use of interconnected machines and devices, intelligent analytics, and people at work. Founded by AT&T, Cisco, General Electric, IBM and Intel in March 2014, the Industrial Internet Consortium catalyzes and coordinates the priorities and enabling technologies of the Industrial Internet. Visit www.iiconsortium.org.