

Linking Pioneer's EFM and SCADA Systems to Facilitate Real-Time, Remote Gas Production Monitoring

For the past two decades, Pioneer Natural Resources has been significantly involved in natural gas production in the Barnett Shale, maintaining 42 producing natural gas wells near Weatherford, Texas. Towards the end of 2008, the company decided to increase its investment and purchased 40 additional gas wells in the region.

Integrating Fields after Acquisition

Pioneer had been experiencing communication issues between its existing EFMs and its SCADA system, but the addition of the new field significantly compounded the issue. Each of the company's fields was set up with different EFM technology. While the existing EFMs accurately monitored gas production, they communicated poorly, and often not at all, with the existing SCADA system. As a stop-gap measure, Pioneer's field technicians manually checked each EFM, which added unnecessary risk to the company's field operations (as a result of added drive time), and was an inefficient use of time and resources.

Pioneer began searching for a partner that could integrate its EFM technologies and allow the devices to seamlessly communicate with its SCADA system. This would in turn allow the company to analyze its production data both remotely and in real time, improving the efficiency of its field operations and allowing the company to better maintain profitability in its Barnett Shale fields.

Linking Disparate Technologies and Making them Communicate

Pioneer chose GloboLogix to develop an integrated solution that would enable remote monitoring of all EFMs. The GloboLogix team immediately faced significant challenges, including the disparate technologies involved, and a very tight timeline — Pioneer requested an on-budget project timeline of four months, just a fraction of the typical timeline for similar projects. To minimize costs, Pioneer also requested that its legacy equipment and systems be used wherever possible.

GloboLogix started by developing a path study of Pioneer's fields. This study allowed GloboLogix to determine which wells could also serve as communication towers and what existing equipment could be leveraged. GloboLogix then designed a bimodal communication system that merged a radio and cellular network, this allowed the maximum amount of existing equipment to be used and overcame geographic barriers to an all radio network.

During implementation, GloboLogix built the communication infrastructure at new wells using repeater towers, radios and push-poles to establish connection to a master radio network. Because of the distance and topography between the new wells and Pioneer's back office, GloboLogix created a localized master network among the new wells that was able to link back to a main master network via a cellular connection. The team used a similar strategy to link Pioneer's legacy wells to the master network.

Achieving Automation and Cost-Savings

GloboLogix' flexibility and expertise with myriad technologies enabled the project to be completed successfully, on budget, and within the tight timeframe allowed. GloboLogix integrated between 30–40 percent of Pioneer's existing equipment into the final system, shaving 45 to 50 days off of the total project time and providing an estimated savings of \$250,000.

Pioneer's new infrastructure enables communication between the company's Barnett Shale fields and its SCADA system, allowing Pioneer to monitor real-time gas flow, casing and tubing pressure, and temperature for all 82 of its gas wells.

The automated communication system has also gone beyond achieving the initial goal of linking Pioneer's disparate EFMs to its SCADA system. The new communication technology has also had a significant impact on Pioneer's accounting and financial forecasting. Through real time, remote monitoring Pioneer can now:

- Manage reservoir production and extend reservoir production life
- Remotely detect potential safety issues at the wells
- Detect broken equipment
- Predict new exploration sites
- Check custody transfers
- Determine the cost of production
- Determine future production value of an individual gas well
- Determine future production value of the field

By creating a customized solution for Pioneer, GloboLogix was able to use new and existing automation technology and equipment to help Pioneer work smarter. As a result, Pioneer is increasing its productivity and efficiency by better using the time and talents of its employees while creating a more efficient operation in the Barnett Shale.