REMOTE
Site & Equipment Management

October/November 2009 www.RemoteMagazine.com A Webcom Publication

Networking

...on page 10

Cano Petroleum's Cockrell Ranch Waterflood Project: What Wireless Network?

The Cockrell Ranch Waterflood project is an ambitious enhanced oil recovery project, located in the Texas panhandle. Cano Petroleum uses state of the art technology and methods to successfully recover oil from wells that would have once been considered 'tapped'. The waterflooding process uses pressurized water to move through the formation, driving raw crude oil out of the ground from wells.

Boss Automation of Spearman, Texas was brought in to design and install the discrete automation platform and a control network to monitor pressure and flow of this water into the wells. With their experience in automation, control and process optimization, the project evolved into the design and implementation of a new, fully automated, self-monitored SCADA system. The system was designed to gather, assemble, and transmit data from the wells and injectors and ultimately bring it back to a master station. This allowed the day-to-day operation of the field to be monitored and controlled from these sites, and allowing the collected data to be used to produce detailed production models.

Considerations for the system included: reliability, maintainability, ease of use, as well as the ability to obtain local support. With the aid of Rexel, the local Allen-Bradley distributor, Boss Automation decided on a winning combination of Allen-Bradley hardware, Rockwell Automation software, and ProSoft Technology wireless communication solutions. Boss Automation's familiarity and past success with these automation products made them confident in the combined solution.

The SCADA system consists of one ControlLogix at a Main Master Station tied to four ControlLogix slave sub-stations and over one hundred custom-built Remote Terminal Units (RTUs), each comprised of an Allen-Bradley MicroLogix 1100 programmable logic controller (PLC) and a ProSoft Technology Industrial Hotspot radio. The main master station and four sub-stations represent the backbone network of the project. Each of the four sub-stations acts as a master for its respective sub-network. All communication from the wells and injectors to the sub-stations, and from the sub-stations to the main master station, is handled wirelessly using ProSoft Technology's Industrial Hotspot solution.

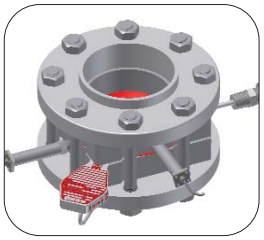
Please see Prosoft continued on page 2

Semaphore Shipping Wireless Monitor that Can Halve the Cost of Wireless SCADA

...on page 4

Enabling the Smart Grid with Cutting Edge Electrical Load Measurement

...on page 6



Overpressure Protection with Enhanced Plant Efficiency From Wireless Communications and Data Driven Device Management

...on page 8

Onsite Power Research: Nanospears Could Lead to Better Solar Cells

...on page 12

Prosoft continued from cover

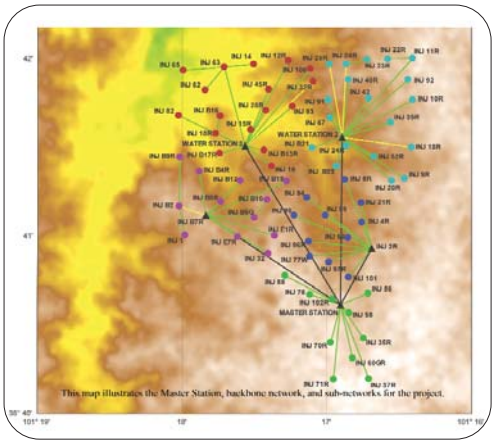
Paul Brooks, business development manager, Networks Portfolio, Rockwell Automation said, “For this application, ProSoft’s wireless technology provides the backbone communication for the integration of this system creating a reliable, industrial and transparent network which allows Cano Petroleum to successfully monitor their process data remotely."

At the main master station, a human machine interface (HMI) application for the system was developed using Rockwell’s RSView 32 software. The graphical interface screens have proven to be user-friendly, and the Messenger Pro feature provides the operators with detailed information about alarm conditions in human voice, by automatically calling the cell phone of the person on call. ProSoft Technology’s RadioLinx OPC Server is used on the remote access computer to monitor the status of the radio network.

An impressive amount of data, over 3,500 discrete input/output as well as 1,000 analog points, is gathered and moved across the wireless network at about 11 Mbps to the main master station where it is then assembled into data log models, then interfaced by Cano’s own proprietary modeling software.

Rexel was instrumental in providing logistical as well as technical support for the project. With respect to this large-scale wireless network, ProSoft Technology provided engineering support throughout the length of the project.

Patrick Haga, ProSoft Technology wireless engineer said, “From the technical side of the project, the main reason this is a success story is because of the planning and care taken before starting the project. I probably spent close to 80 hours all told working with Boss Automation control engineers on a path study using ProSoft’s Pathloss software. We worked very closely together, before and throughout the installation of the project, not only on the layout of the network but on the strategy for PLC messaging.”



This map illustrates the Master Station, backbone network, and sub-networks for the project.

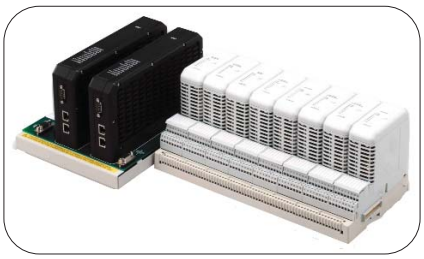
The overall network covered approximately twelve square miles with the longest link being only about two miles, and a bulk of the radios were positioned in an area of about three square miles which presented a concern. “In a radio network of this size it is imperative that care be taken in setting up the PLC messaging,” said Haga. “If all radios are trying to communicate at the same time, you can quickly swamp your bandwidth with RF collisions and retries.”

Haga continued, “This in mind, we discussed the need to create a polling style network rather than having all the radios trying to communicate at the same time. It takes a lot of planning up front to successfully install a radio installation of this size, and ProSoft’s Technical Support group provides an excellent planning resource.”

Chris Deakin of Boss Automation said, “The process is incredibly reliable, consistent and makes for an essentially self-managed site. From the main SCADA monitoring station, the operators are able to see virtual diagrams of the wells and what is going on within them, as well as all the data collected by the RTUs and control units.”

The project went live in spring of 2008, and has since had near zero downtime. “The wireless network works so seamlessly and reliably that it is virtually transparent to the user,” said Deakin. “When all was said and done I asked the customer how they liked the wireless network. Their response: what wireless network?”

Harry Forbes of ARC Advisory Group said, “The Cockrell Ranch Waterflood project illustrates three important points about industrial wireless. First, wireless is indispensible for this kind of SCADA project to be cost-effective. Second, end users need to select hardened, industrial, field-proven products to provide a lifelong, reliable wireless solution. Thirdly, a well-designed wireless network can deliver data in a SCADA system with very high reliability, in fact so high that end users forget about it.”



GE Fanuc Intelligent Platforms Announces PAC8000 RTU Controller

GE Fanuc Intelligent Platforms has released its new PAC8000 RTU controller, a rugged, field-mountable platform. Combined with the 8000 Process I/OTM, it offers flexible system design, high system availability and it can utilize any off-the-shelf HMI package.

The PAC8000 RTU Controller is well suited for all types of RTU applications, including oil & gas pipelines and wellheads. It is designed for use in the harshest environments, operating over a temperature range of -40ºC to 70ºC, and is resistant to 30 g shock, 5 g vibration and G3 corrosive environments. Access to timely and accurate mission-critical information from fixed assets such as oil and gas wells, compressor stations, pipelines, fluid storage tanks and utility meters, can eliminate critical gaps in oil and gas operations, resulting in higher productivity and long-term growth. The PAC8000 RTU’s relative low power also makes it suitable for applications using solar power.

The PAC8000 engineering software takes advantage of Microsoft Windows-based object-oriented technology, graphical user interfaces and easy to learn software solutions to reduce engineering time. It executes control strategies and manages all control activities for the I/O modules providing a tight control loop response, quickly giving a control output in response to input data. It also incorporates a rigorous redundancy model, HART capability and a fault tolerant Ethernet implementation to manage communications on the control network and deliver reliable operation.

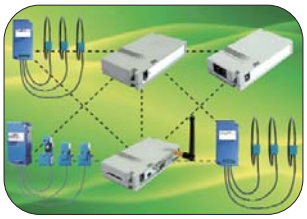
The PAC8000 RTU supports DNP3 Ethernet communication protocol as well as fully supports the five IEC 61131-3 automation languages. Any combination of Ladder Diagram (LD), Sequential, Function Chart (SFC), Function Block Diagram (FBD), Structured Text (ST), Instruction List (IL), plus Flow Chart can be used to develop, download, simulate, debug, monitor and edit application programs.

The PAC8000 RTU Controller has two high-speed Ethernet ports to provide fault-tolerant communication. The RTU supports fault tolerant communications to the control room SCADA, however in the event communications are lost, the RTU can continue to operate autonomously or adopt a user-defined safe state. If the RTU continues to operate, data will be logged for transmission once communications have been restored. The control programs are held in nonvolatile memory so they are retained in the event of a power loss. A new control program can be downloaded to a controller while the existing program is still operating. When the download is complete, the controller will automatically switch to the new program without operation interruption.

LEM Releases New Wi-LEM Wireless Sub-Metering Components

LEM has introduced the extension of its Wi-LEM (Wireless Local Energy Meter) family to allow the remote measurement and monitoring of electricity, water and other metered utilities as well as temperature and humidity. It allows industrial and commercial enterprises to break down energy and water usage and identify areas of efficiency improvement. The Wi-LEM components feature a ten-fold increase of RF power from 1 mW to 10 mW, increasing the distance between nodes compared to the previous LEM generation of components. By using the 802.15.4 wireless communication standard, and the use of split-core transducers, Wi-LEM reduces the time, cost and disruption involved in deploying a sub-metering installation.

The Wi-Pulse is an additional dual-input pulse counter used to count and transmit pulses generated by utility meters. It can be connected to an existing Wi-LEM network thus expanding the range of utilities that can be monitored, in addition to electricity. Wi-Pulse therefore enables readings from existing stand-alone water and energy utility meters and sub-meters with a pulse output to be monitored centrally using a Wi-LEM network. The Wi-Zone is a temperature and humidity transducer that connects to a Wi-LEM network, allowing environmental conditions to be monitored. Both new devices are battery powered, simplifying installation as they require no external power supply. They also both feature an internal integrated antenna, making the transducers compact and well suited for retrofit applications.



The Wi-LEM family of Energy Meter Nodes (EMN) has also been enhanced to offer measurements of high currents up to 2,000 ARMS. EMNs provide more information than a simple sub-meter as they measure active, reactive and apparent energy plus maximum current and minimum voltage. EMNs comprise an assembly of one to three current transducers with an integral signal-processing module. They can be deployed to measure energy consumption at any point in a power cabinet and transmit the data. High-accuracy and compact size is provided by the use of split-core Rogowski coils, which also simplify installation. Additionally, all three units work with LEM’s Mesh Node and Mesh Gate to ensure compatibility with existing solutions.