**Monitoring: Oilfield Generators**

**By: Doyle Taylor, President & CEO**

An application we work with regularly is monitoring for generators used for power generation on Drilling Rigs. Many of the most popular genset models have only a very basic local monitoring system, and no generator controls. In most applications, there is no monitoring of the engines by the rig control system. There is tremendous value to monitoring the generator engines to maximize fuel economy, minimize downtime, and drastically reduce rig blackouts.

In the Onshore Drilling Rig market in North America, Monico has approximately 1500 gateways installed that integrate the power generators into the rig automation system or provide remote monitoring capabilities for predictive maintenance or for managing fuel consumption. Our first application was to provide remote fuel consumption monitoring capability of generators for EnCana Oil & Gas in cooperation with the Pason EDR system. They operated about 20-25 large drilling rigs in the Haynesville Shale in 2008 with a minimum of three gensets per rig. Each of these rigs burned 2500-3000 gallons of diesel fuel per day and they were looking for ways to reduce operational cost. After 12 months of testing and procedural development, EnCana was able to reduce fuel consumption by approximately 50%. This project turned out to be the highest rate of return operational cost savings project for EnCana over the next few years. This application has spun off to provide real value to many customers. Because of this experience, over the next few years we became standard equipment on all new rigs for several major drilling contractors, and one major contractor retrofitted approximately 150 existing rigs with our Gateways. In addition we have added many different types of data analysis to cover much more than just fuel consumption. Again, the quality of our product, the expertise to make the product work in this extremely difficult environment, and our Support Team are the keys to success.

A number of drilling contractors are now installing Monico Gateways to integrate the engines into the overall rig automation system. One major drilling contractor reports that engine integration has virtually eliminated rig blackouts and significantly reduced fuel consumption. Another major Natural Gas E & P company is installing a custom engine monitoring system on all of their Mid-Continent rigs to monitor and reduce fuel consumption, and yet another major E & P company is using Monico gateways to monitor not only the engines, but additionally the GTI Bi-fuel natural gas injection system, pre-catalyst and post-catalyst pressure and temperature, and a hazardous gas detection system. Selected data is logged on a 2GB Compact Flash card and presented to the contractor via our Virtual HMI using only Internet Explorer. The contractor's customer is also allowed to view certain information via a separate custom HTML web server.

# Drilling rigs are one of the most challenging applications for communications. Typically, we are forced to run communications wires in the same raceway as extremely high current power wires into the power house which contains several variable frequency drives that create a huge amount of electrical noise. Our experience in this environment has forced us to learn how to properly wire these installations to operate with rock-solid reliability. We will typically install an isolated repeater to eliminate any noise collected in the wiring run from affecting the engine operation, and proper grounding of the engine and the drain wires is critical.

# Genset data is brought in via the dedicated port, which leaves (2) RS-232 ports, (1) RS-485 port, and (1) Ethernet port for gathering data from other system components, such as Woodward controllers. Each serial port can communicate via one protocol independently, either master or slave. The Ethernet port can communicate via four protocols simultaneously. The addition of I/O modules for analog and digital I/O provides a powerful monitoring solution. The ability to push all data to PLCs such as [Allen Bradley](http://www.monicoinc.com/products/CDLGateway/allen-bradley.shtml), [GE Fanuc](http://www.monicoinc.com/products/CDLGateway/ge_fanuc.shtml), Siemens and Omron is very important.