



Case Study 1902

Baker Hughes INTEQ's Power Needs are Met with UPQ™ Technology

The Customer

INTEQ, the measurement-while-drilling (MWD) division of Baker Hughes, provides advanced drilling technologies and services that deliver efficiency and precise well placement. INTEQ's MWD technology is recognized as the industry benchmark for performance and reliability. The company's custom-collar MWD systems chart real-time directional measurements in multiple drilling applications. The measurements provide accurate information to help oil companies enhance their drilling performance, optimize well placement and gather quantitative information about the reservoir.

The method of acquiring data through MWD technology is accomplished by connecting a "downhole tool" behind the drill bit. While the drilling is taking place, all pertinent data is transmitted up hole via a series of precisely timed mud pressure pulses resulting in a data stream which is interpreted by sophisticated acquisition hardware located inside of the logging unit. Real time data is used by the customer to make critical decisions during the drill process. Later, when the drill string is brought out of the hole to change the drill bit, experienced field service engineers collect data stored in the tool's memory to provide a more detailed analysis of the hole section drilled. Data collected monitors the density, porosity as well as formation gamma of the formation being drilled through. Additional data on the strata's structure and the bottom hole assemblies' direction and inclination are also collected.

The Challenge

Power quality, durability (certified rugged), serviceability, and price are all important factors in the drilling industry. Drilling requires critical applications in order to function correctly and with precision. A power failure may result in the loss of valuable data, costing days of drilling time, resulting in millions of dollars lost daily.

Hostile environmental conditions often exist in the well, contributing to difficulty in acquiring the downhole data. The drilling tools are pushed down and through the well, subjecting them to high shock and vibration. In spite of these conditions, the cost of drilling compels customers to demand high standards of service with little down time from equipment failure. Meeting these specifications requires the integration of highly trained personnel and advanced technology.

The Solution

INTEQ turned to Power Innovations for a customized version of the company's Q-RX™ (rugged) Uninterruptible Power Quality™ (UPQ™) systems. The rugged systems were designed to withstand extreme shock and vibration, meeting the MWD's critical needs. The Q-RX exceeds the unique rugged environment specifications in shock, vibration, temperature, and humidity standards.

Baker Hughes INTEQ

INDUSTRY SERVED

Oil Exploration & Research

CHALLENGE

The Measurement-while-drilling (MWD) equipment must withstand extreme environmental conditions, while functioning with precision.

SOLUTION

The Q-RX™ System exceeds the unique rugged environment specifications and meets the MWD critical needs.

CUSTOMIZATIONS

- Special Connectors Installed
- Custom Labeling

ADVANTAGES

- MIL-STD-167 -- Vibration Standards
- MIL-STD 810E - Shock Standards
- MIL-STD 810 -- Thermal and Humidity Standards
- Rugged Certified

Advantages of the Q-RX System

Vibration and Shock Testing

MIL-STD-167 (Mechanical Vibrations for On-Ship Board Systems) – Q-RX systems meet or exceed this vibration standard from 4 to 50 Hz. The operational and non-operational vibration tests deliver up to 2g forces for two to four hours.

MIL-STD-810E (Environmental Test Methods and Engineering Guidelines) – Q-RX systems meet or exceed this shock standard. In each axis, multiple positive and negative shocks are induced up to 30g forces for levels ranging from 2g to 30g.

Thermal and Humidity Testing

MIL-STD-810 – Q-RX systems meet or exceed this environmental standard. The systems operate in freezing temperatures of 22° F (-30°C), sweltering temperatures up to 140° F (60° C), and even in condensing humidity.

As part of the qualification process, the Q-RX system was run through shock and vibration testing. The units are approved for durability in the rugged environments where INTEQ operates.

Conclusions

“In our line of work, constant reliable power is critical. It was necessary to find a product that provides quality power as well as one that could withstand extreme conditions. When we began to work with Power Innovations, we quickly realized that our demanding requirements had been met,” says Randy Istre, Team Lead and Surface Systems Reliability Engineer of Baker Hughes INTEQ.

Competing Technology

In the past, the number one issue in dealing with power was backup power for equipment in the event of power failure. The basis of typical UPS systems and generators on the market today is still backup power; however, electrical equipment requires a new level of power quality and management tools that extend and enhance this most critical resource.

Power Innovations

Launched in 1997, Power Innovations has pioneered a revolutionary set of solutions to generate, store, and manage AC power. Power Innovations’ mission is to provide and manage continuous high-quality power in conjunction with, or even independent of, utility services worldwide. Power Innovations is helping forward-thinking companies accomplish this goal through a new class of technology called Uninterruptible Power Quality (UPQ).

Today, Power Innovations’ UPQ systems, coupled with its UPQnet-agent II™ IP management tools, assist organizations of every size in addressing the key issues surrounding power management.

Power Innovations’ long term strategy includes fully integrated power management and control, storage, and generation for total power independence. Power Innovations’ line of power management products is currently being marketed. The company is involved in the development of a spectrum of solutions for power storage. Currently Power Innovations offers a variety of alternative generation options. In the near future, Power Innovations plans to introduce the PowerWell™, a revolutionary solution to provide green renewable energy generation for homes and business, with or without grid interaction.

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- Randy Istre

Team Lead and Surface System
Reliability Engineer
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