Baker Hughes reduced rig time with effective completions design

Benefits
- Decreased risk of electrical interference between ESP and downhole gauge
- Reduced rig time with better completion design
- Increased reliability of motor temperature sensor
- Eliminated need for additional downhole cabling and equipment to monitor ESP system
- Measured additional and redundant parameters

Well background and challenges
- Obsolete equipment
- Electrical interference between the ESP and the downhole gauge
- ESP trips because of bad data

Baker Hughes solution and results
- SureSENS 125 permanent downhole monitoring system
- SureFlo 298 flowmeter system
- WellLIFT E ESP monitoring system
- Reduced risks of ESP downtime

Old equipment
A major North Sea operator has used Baker Hughes electrical submersible pumping (ESP) systems and permanent downhole gauges for more than 10 years. The systems were configured across a venturi flowmeter and used on a project with more than 20 wells.

The downhole gauge instrumentation collected critical pressure and temperature data and used the data to calculate accurate and reliable flow rates. The downhole gauges also protected the ESP systems from failures. They warned the operators when an ESP was either overheating or operating outside of its design parameters.

As anticipated, the equipment had a finite life cycle and began to produce electrical interference between the ESP and the downhole gauge. The instrumentation was also producing bad data that caused the ESPs to be tripped.

New technology
In 2008, Baker Hughes identified the biggest problem was the age of the system and equipment. Upgrading the technology would address the equipment obsolescence and eliminate the other problems that were occurring.

After discussions about new Baker Hughes technologies, the operator selected a downhole instrumentation technology that would also be part of the design of the upper completion.
The operator decided that the existing ESP technology would remain the same, but the downhole gauge architecture would change. The operator selected the following Baker Hughes technologies:

- SureSENS™ 125 downhole gauges to provide accurate pressure and temperature data for the life of the project
- SureFlo™ 298 flowmeter system to give real-time production data without affecting recovery potential
- WellLIFT E™ ESP monitoring system to supply downhole, surface and diagnostic parameters, enhance system management, and prolong the equipment life

Both the operator and Baker Hughes wanted to make sure the proposed new technology would meet the future requirements for the surface equipment. To avoid the problems associated with integration into the nearly full, existing system, a new, separate system was implemented.

The new system used the same Baker Hughes software and allowed the data from the SureSENS 125 gauge and WellLIFT ESP monitoring system to be collected in a single place before being handed off to the client’s control and database systems.

Using the new technologies, the customer has worked over a number of wells and confirmed a significant increase in overall system reliability.