DAY 1 MAY 2, 2011 RELIANT PARK HOUSTON, TEXAS PUBLISHED BY *WORLD OIL* MAGAZINE

OFFSHORE TECHNOLOGY CONFERENCE

THE OFFICIAL 2011 OFFSHORE TECHNOLOGY CONFERENCE NEWSPAPER

Precision well pressure management

Maintaining tight control of bottomhole pressure is critical to successful application of managed pressure drilling (MPD) and underbalanced drilling (UBD) techniques, especially in MPD applications where the window of operation is often significantly narrower than in conventionally drilled wells. Keeping the bottomhole pressure above the pore pressure and wellbore stability thresholds, as well as below the formation fracture gradient, often requires highly accurate control to avoid losses or damage to the wellbore.

The Low Pressure Autochoke Console (LPAC) system from M-I Swaco, a Schlumberger company, is designed for the low surface pressure applications of MPD and UBD and can control casing pressure within a range of ±50 psi. The console has a maximum working pressure of 1,500 psig and a minimum control casing pressure of 100 psig.

A dual console provides independent control systems to simultaneously regulate the set point pressure for two Autochoke units. The console allows the operator to directly set and maintain the desired back pressure on the well. Adjustments to the back pressure can be made via the electronic touch screens on either the local hydraulic power unit (HPU) console or a remote human-machine interface (HMI) panel near the driller.

A major operator needed a solution that would allow annular back pressure to be held while flow drilling. The well plan was to drill a series of laterals underbalanced, while also holding near-constant bottomhole pressure during connections. M-I Swaco recommended that the operator use its LPAC console system.

During the drilling phase, the LPAC system held 350 psi back pressure on the casing, which allowed the operator to strip to the bottom under pressure. With the ability to hold constant wellbore pressure while drilling, the rig was able to reduce the entire drill time by 10 days, resulting in an estimated savings of $1 million. When the LPAC dialed in on the correct casing pressure, the rate of penetration increased by 15–30 ft/hr.

The LPAC system is designed with field problems in mind because the choke is typically used during critical rig operations where a loss of rig air or electrical power could have catastrophic results. Several backup devices were added, including an internal air tank, hydraulic accumulator and an uninterruptable power supply. Once the backup devices are charged, the LPAC system can operate without rig air for two hours and without rig power for one hour under normal operation. These backup devices work seamlessly so the choke operator can continue operation without any interruption in control.

Both the local and remote consoles are built to withstand the harshest conditions and are made from stainless steel. The local console is skid-mounted for easy installation on or near the rig. The remote console can be mounted in the dog house or control room. Both consoles are ergonomically designed to provide operator comfort.

Whatever challenges a well presents, during mud pump startup or shutdown, making or breaking connections or anytime low pressure conditions require precise control, the LPAC system is designed to make the job of monitoring well pressure through the Autochoke pressure control choke simpler and safer.

The LPAC unit is on display at M-I Swaco Booth 4541. •

Local hydraulic power unit of the LPAC system.