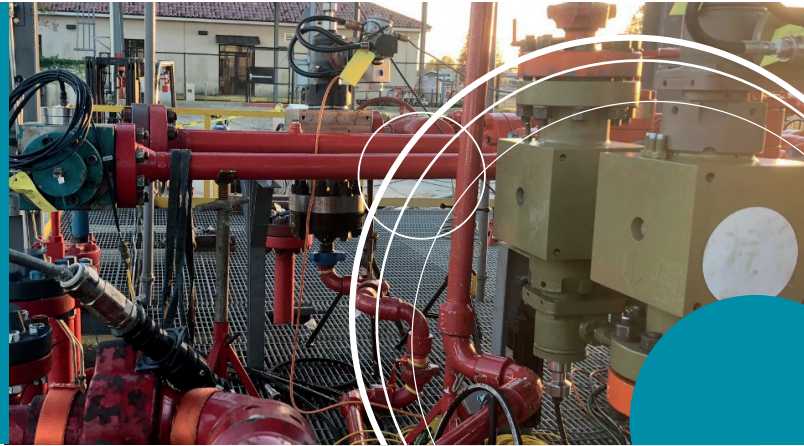




/ Expro Excellence PowerChokes®

Expro tests innovative technology solutions



Objectives/background

- Expro has developed a number of technological innovations in the PowerChokes product line, which have the capability of integrating with our existing product solutions
- These developments were tested in a flow loop environment to mirror actual well conditions
- The testing was carried out at Louisiana State University utilising a well with rig mud pumps

Expro Excellence

- Expro tested the following hardware:
 - 3" electric choke
 - 4" hydraulic choke
 - 4" electric choke
 - New choke trims for improved pressure and flow control
- As part of the testing, the following software upgrades were carried out:
 - Automated controls for electric chokes
 - Automated controls for hydraulic proportional valve control
- ABP software upgrades
 - PRV system integration
 - Auto tuning
 - Dual choke mode
 - Pressure relief mode

Value to client

- Expro successfully tested the electric choke with 3" and 4" trim, with less than 10 seconds for opening and closing with both 230 VAC and 480 VAC power driven options
- Pressures of up to 3,000 psi were applied to all equipment at flowing conditions containing debris. The electric choke and the 4" choke had no alteration in performance in terms of precision or speed under the flow and pressure conditions. The chokes successfully held pressure between the gate and seat throughout all testing
- The test also demonstrated the very tight pressure control (within ± 10 psi). With extreme fine tuning of pressure the choke movements were under 0.1%
- Pressure control from 100 psi to 3,000 psi was used in both the manual and automatic control mode
- The Pressure Relief Valve (PRV) and its HPU were integrated effectively into the ABP panel. This also proved that the PRV functionality prevented over pressure and loss in all pressure in emerging situations
- Dual choke mode was also tested to prove that a second choke could be used to switch over if the first choke experienced excessive flow rate pressures or plugging
- The pressure relief mode was tested which showed that a secondary choke could be used to help maintain setpoint pressures in the case of severe changes in flow or fluid properties while flowing
- The test demonstrated that different trims helped control the pressure and flow more uniformly with a pressure control from the 5% open position

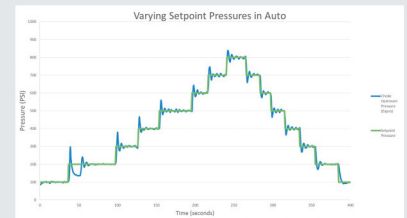


Fig 1:
3" electric choke being tuned in auto mode

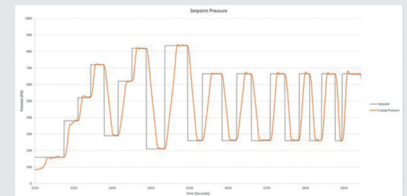


Fig 2:
4" hydraulic choke holding varying setpoints

Contact

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