

Lab Tests Verify LPAC as Viable Choke System for MPD/UBD

THE PROBLEM

No system existed for controlling low well pressures in MPD/UBD applications.

THE SITUATION

M-I SWACO launched an R&D effort to develop a specialized choke control system for MPD/UBD.

THE SOLUTION

The result of the R&D project was the LOW PRESSURE AUTOCHOKE CONSOLE (LPAC), which was verified in lab tests at Louisiana State University System based on AUTOCHOKE* technology

The Situation

M-I SWACO launched an R&D effort to create a specialized choke control system for Managed Pressure Drilling (MPD) and Underbalanced Drilling (UBD) applications. These applications generally require the control of lower pressures within a tight fluctuation window.

The Solution

The result of the investigation was the LOW PRESSURE AUTOCHOKE CONSOLE* (LPAC). The new technology is based on the existing AUTOCHOKE* system. The LPAC provides clients a simplified, technologically advanced, and cost-effective method to control the relatively low well pressures seen in MPD and UBD applications. The LPAC was developed to deliver a cost-effective solution for controlling back pressure on wells lower than 1500 psi within an operating window of +/- 50 psi.

The Results

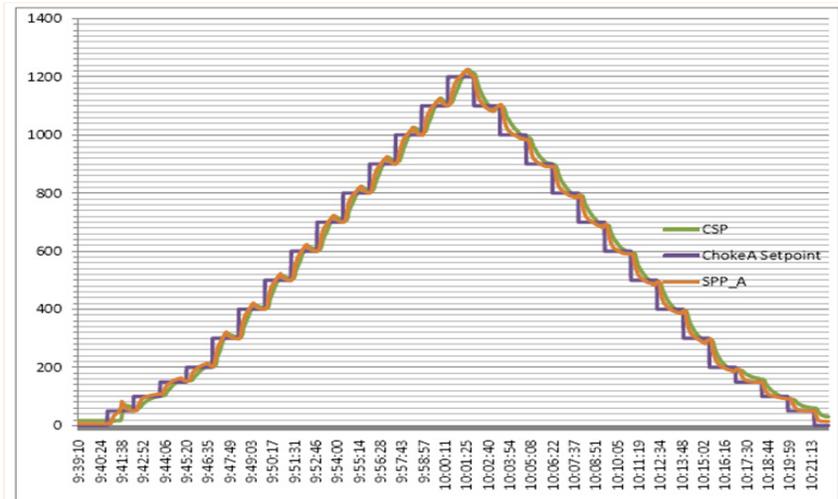
M-I SWACO conducted multiple yard tests of the LPAC at Louisiana State University's Petroleum Engineering Research and Technology Transfer Laboratory. The results showed the technology was able to consistently manage pressure on the casing to within +/- 50 psi while simulating the pump ramp up and ramp down conditions seen regularly on wells during connections.

THE RESULTS

- Consistently managed pressure within +/- 50 psi
- Exhibited 20 psi offset between SPP and CSP.
- Tests showed LPAC superior to other chokes in the market

The Details

This graph shows the results of a step test performed using Electronic Control with third-party input sending new set points at a range from 50 psi to 1200 psi to the LPAC. The test was carried out on the LSU short well of 5280 ft (1609 m) and the pump running at 60 gpm. . An offset of approximately 20 psi is noted between the Set Point Pressure (SPP) and the Casing Pressure (CSP). This offset exhibits hysteresis with CSP lagging the SPP. The CSP consistently is lower than the SPP on ascending pressures changes and higher on descending pressure changes. While this behavior is attributed to the mechanics of the AUTOCHOKE, it is superior to the responsiveness of other chokes in the market. The SPP had a consistent ramp up and overshoot of around 20 – 30 psi during each increasing step change and then would settle down to approximately the Choke A Setpoint value. The reverse was true on the descending side.



Questions? We'll be glad to answer them.

If you'd like to know more about the LPAC product and how it's performing for our other customers, please call the M I SWACO office nearest you.

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