

Intelevate™ Platform Remote Optimization of Proportional Integral Derivative (PID) Mode Improves Uptime

SYSTEM STABILIZED AND DRAWDOWN INCREASED

NORTH AMERICA

CHALLENGE

- » System instability due to various downhole system challenges
- » Undesired shutdowns due to motor fluctuations

SOLUTION

- » Remotely optimize PID mode of operation where the VFD alters its speed to stabilize the system based on a set target
- » Collaboration with field personnel and account manager

RESULT

- » Increased system stability with motor loading variations reduced from 6.5 A to 1 A
- » Consistent motor temperature reduces well faulting and shutdowns, improving ESP system reliability and run life
- » Increased draw down by 20 psi within seven hours of PID implementation
- » Reduced field tech interventions and miles driven, increasing safety

OVERVIEW

Regardless of the well type, challenges in the downhole system can cause unstable electric submersible pump (ESP) operation. These challenges, like paraffin, solids, trash, and more, lead to downtime, suboptimal production, and shortened run life.

CHALLENGE

Operators cannot address the problems of dynamic well conditions by running an ESP at a fixed frequency. The situation is exacerbated when the operator does not have ESP expertise within their team to address these challenges.

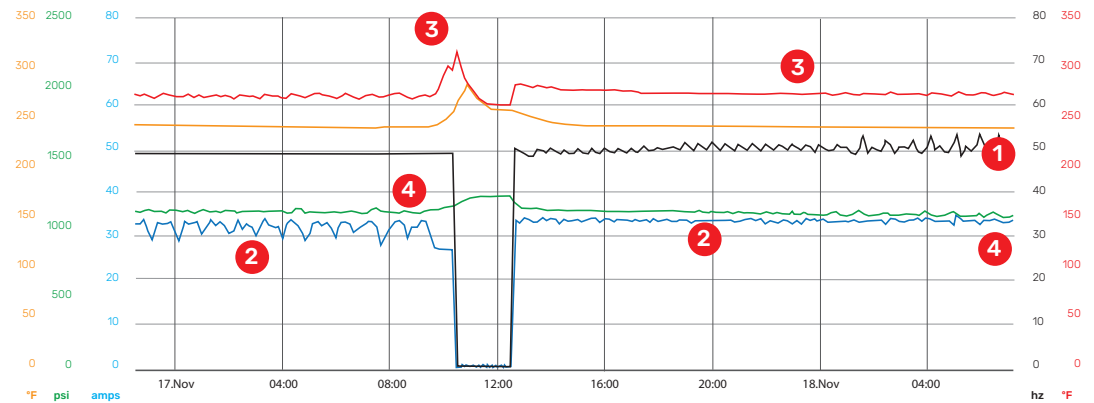
SOLUTION

The Halliburton Intelevate platform team works with field personnel to set up a SummitView™ Proportional Integral Derivative (PID) mode of operation. The PID mode of operation continually operates while the well is running by varying the frequency to maintain a target. Intelevate team members review parameters to select desired target variable frequency drive (VFD) amps, motor amps, and intake pressure with limitation bounds. They also select the mode's reactivity level, fault set points, and the minimum and maximum speeds of operation. The team can then diagnose problems in the SCADA trend analysis and coordinate with field personnel and account representatives to make remote changes in real-time.

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RESULT

The PID mode allowed the Intelevate platform team to constantly monitor and adjust as needed, which decreased stress on the system due to varying operations and shutdowns. This resulted in increased uptime and production by eliminating or reducing field service trips to restart or troubleshoot wells, which reduced operating expenses and minimized environmental and safety risks.



Motor Current - amps
 ~ 0.0 ~ 34.7 ◯ 34.7 ~ 29.9

Motor Frequency - hz
 ~ 0.0 ~ 53.24 ◯ 53.24 ~ 45.23

Pump Intake - psi
 ~ 1072.6 ~ 1224.4 ◯ 151.8 ~ 1117.5

Motor Temperature - °F
 ~ 262.4 ~ 315.9 ◯ 53.5 ~ 274.3

Fluid Temperature - °F
 ~ 240.9 ~ 281.1 ◯ 40.3 ~ 244.0

- 1 PID continually operates while the well is running by varying the frequency to maintain a targeted motor load
- 2 Motor load goes from a ~6.5A variation to a ~1A variation
- 3 Eliminates faulting on motor temperature by providing a consistent temperature across the well
- 4 Drawdown was increased by 20 psi as the intake pressure went from ~1100 psi to ~1080 psi within seven hours of the change to PID mode

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