CASE STUDY

HALLIBURTON

New Mexico, United States

ESP performance improved in severe gas slugging conditions

Hydro-Helical Slugger™ gas separator and Intelevate® platform restore well stability and increase production in Delaware Basin

CHALLENGE

- Severe gas slugging from undulating well path
- Motor overload due to liquid starvation
- Untuned VSD and back-pressure controls
- Short ESP run life and low production

SOLUTION

- Use tapered Tiger Shark® pumps
- Deploy Hydro-Helical Slugger™ gas separator
- Add pneumatic back-pressure valves
- Configure PID control loops
- Apply Intelevate® platform remote optimization

RESULT

- Increase oil and gas production
- Extended ESP run life 325%
- Reduce field visits and downtime
- Minimize safety exposure
- Improve cumulative revenue
- Stabilize motor

Hydro-Helical Slugger™ gas separator

Overview

An operator in the Delaware Basin struggled to maintain stable production from a well with gas–liquid ratios that exceeded 1,000 SCF/STB. The first electric submersible pump (ESP) installation produced 21 BOPD and 353 MCFPD and failed after 110 days due to extreme slugging. The operator required a solution that could manage rapid inflow fluctuations, protect ESP components, and extend runlife to make the well economically viable.

Summit ESP®, a Halliburton service deployed a new system design centered on the Hydro-Helical Slugger™ gas separator and managed ongoing operations through the Intelevate® platform. The combination improved fluid availability during slug events, stabilized motor loading, and restored consistent production.

Challenge

Severe gas slugging resulted from undulating well geometry and long horizontal sections that allow gas and liquid to separate and form large slugs. The recurring slugs deprived the gas separator of liquid, which caused wide swings in motor temperature and current. The operator lacked the variable speed drive (VSD) programming expertise required to counter these fluctuations, and back-pressure controls were not tuned to the well's behavior. As a result, short run life and limited production threatened the well's economic viability.

SUMMIT ESP

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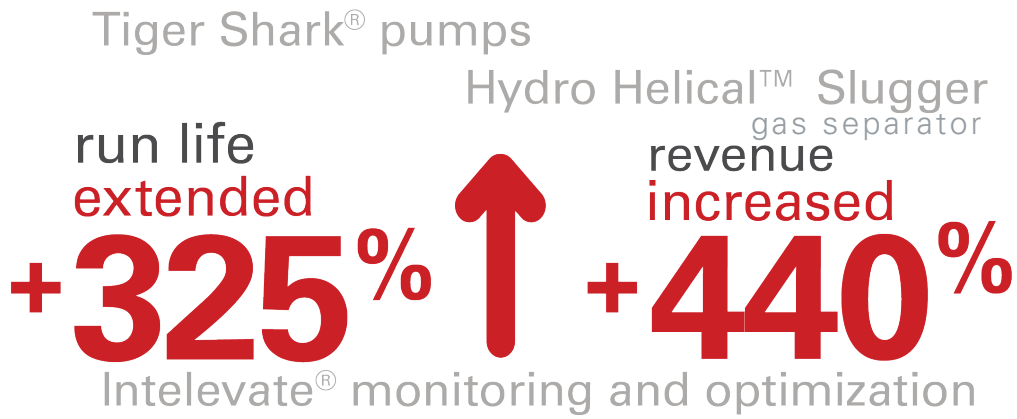
Solution

Halliburton designed an ESP system featuring tapered Tiger Shark® pumps and tandem gas separators. A 400-series Hydro-Helical Slugger™ gas separator with internal reservoirs increased liquid availability at the pump intake, which allowed for stable separator performance during severe slug events.

The Intelevate® platform team supported operations with remote surveillance and optimization powered by the Summit Knowledge® digital ecosystem. Engineers installed pneumatic piston back-pressure valves and configured proportional integral derivative (PID) control loops to regulate motor current. Continuous remote monitoring and optimization provided automated responses that reduced unnecessary downtime and eliminated no-flow events.



Result

The redesigned ESP system and remote optimization program delivered substantial gains in well stability and economic performance. Oil production increased 43%, from 21 to 30 BOPD, while gas production rose 113%, from 353 to 758 MCFPD. ESP run life extended by 325%, from 110 days to 468 days.

More than 1,250 remote operating changes reduced field visits, lowered equipment-related downtime, and minimized exposure to safety risks. Cumulative revenue improved from USD $225,000 to more than USD $1.2 million. Stabilized motor current and temperature increased operational uptime by 5%.

The operator gained a more resilient ESP system that withstands severe slugging and delivers sustained long-term production.

For more information, contact your local Halliburton representative or visit us on the web at www.halliburton.com

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