

Middle East

Deeper ESP placement increases production in nearly depleted unconventional reservoir

Optimized system stabilizes performance and extends run life in low-pressure conditions

CHALLENGE

- ESP underload conditions triggered frequent shutdowns
- Low submergence reduced intake pressure and stability
- High motor temperatures increased failure risk
- Dogleg severity of 7°–8° per 100 ft restricted installation
- Elevated intervention frequency increased cost

SOLUTION

- Set ESP deeper in 7 in. liner
- Replace 3 1/2 in. tubing with 2 7/8 in. tubing
- Deploy Tiger Shark® low-range pumps
- Install Hydro-Helical® gas separators
- Apply XR flange sleeve technology for gas handlers

RESULT

- Increased pump intake pressure by 150-200 psi
- Reduced ESP shutdown frequency
- Extend equipment run life by 3x
- Lowered tubing cost by 30%
- Sustained production above 600 BOPD

Overview

A Middle East operator struggled to maintain stable production in an unconventional reservoir with rapid pressure depletion. The decline of reservoir pressure reduced inflow and forced the electric submersible pump (ESP) system into underload conditions which triggered shutdowns, increased motor temperature, and caused production losses. High dogleg severity (DLS) within the 7 in. liner added complexity and limited deployment options for standard ESP systems. The operator required a reliable artificial lift solution that could sustain production, improve stability, and reduce operating costs in a low-pressure, low-flow environment.

Challenge

Reservoir pressure decline created persistent instability in ESP performance. Low inflow reduced submergence and decreased pump intake pressure, which led to frequent gas lock events and high motor temperatures. The ESP system shut down repeatedly, which disrupted production and increased intervention frequency.

The well trajectory added further complexity. DLS values of 7° to 8° per 100 ft restricted tubing movement and increased installation risk. Standard ESP configurations could not navigate these conditions without added mechanical risk.

The operator faced increased operational costs, unstable production, and limited confidence in system reliability.

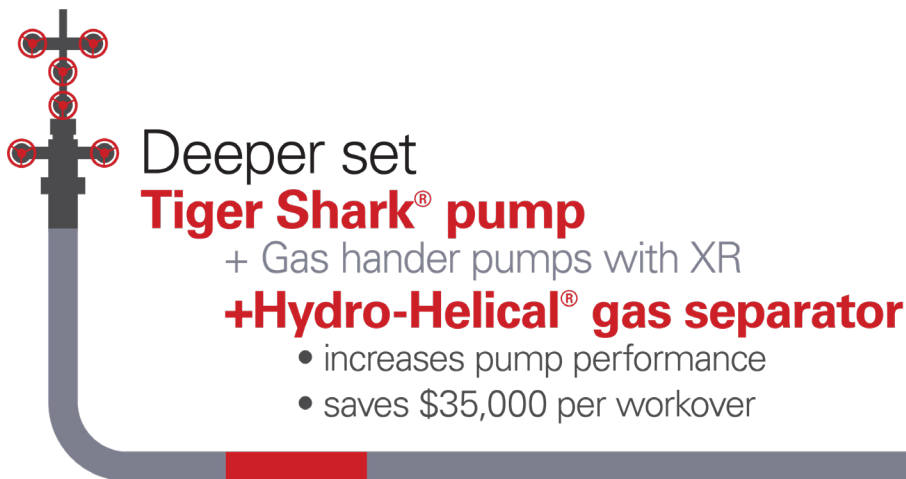


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Solution

Summit ESP®, a Halliburton service, designed a deeper ESP placement strategy to increase submergence and stabilize intake pressure. The team set the ESP at the second tangent inside the 7 in. liner, which increased pump intake pressure and improved operating stability. To address high DLS, the operator replaced the existing 3 1/2 in. tubing with slimmer 2 7/8 in. tubing. This change removed casing restrictions, reduced mechanical risk amid installation, and lowered tubing costs.

Halliburton configured the ESP system with Tiger Shark® low-range pumps, Hydro-Helical® gas separators, and gas handlers with XR flange sleeve technology. This design improved gas handling performance, provided downthrust protection, and maintained efficiency at low flow rates. The integrated system increased intake pressure by 150 to 200 psi, reduced temperature-related shutdowns, and improved overall system reliability.



Results

The optimized ESP setting depth increased submergence and stabilized intake pressure, which improved system performance and reduced downtime. The operator achieved more consistent production and reduced intervention frequency. The deeper placement and redesigned system tripled equipment run life, which reduced workover requirements and associated costs. The smaller tubing reduced material cost and simplified deployment.

Sustained daily production rates exceeded 600 BOPD, which provided a stable revenue stream and improved field economics. The operator adopted this configuration as the standard design for similar wells.

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