



MATURE FIELDS



UNCONVENTIONALS

Summit ESP® Successfully Replaces Rod Lift System in Low-Flow Well

MULTI-TECHNOLOGY SOLUTION GENERATES USD 1.4 MILLION IN REVENUE FOR OPERATOR IN JUST SIX MONTHS

NORTH DAKOTA

CHALLENGES

- » Increase production in low-flow well
- » Solve excessive gas and solids issues

SOLUTIONS

- » Tiger Shark® SF320 pump system
- » Tiger Shark® SFGH2500 gas handler
- » Defender® super sand seal
- » Liberator™ vortex gas separators

RESULTS

- » Increased run life and reduced downtime
- » Improved production, generating USD 1.4 million in revenue in just six months

OVERVIEW

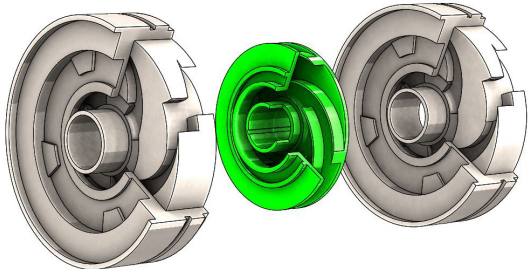
An operator in the Bakken formation initially used an electric submersible pump (ESP) system and became displeased with the costs compared to other lift solutions. The operator switched to rod pumps, but higher gas rates and drawdown issues caused production rates to drop. Given the conditions, the operator chose to use ESPs over rod lift systems to achieve greater production results.

CHALLENGES FOR CONTINUOUS OPERATION IN DIFFICULT CONDITION

Rod lift systems have their own challenges, especially in extreme conditions with excessive gas and high depths. Gas is compressed within the pump itself before actually producing liquid. Solids fallback is also an issue, particularly in the Bakken formation. The client had wells with pump set depth ranges from 8,500 feet to 9,800 feet (2,591 meters to 2,987 meters) and bottomhole temperatures around 190°F (88°C). The desired results were not achieved with rod pumps, so the client reconsidered ESPs using the latest technology from Summit ESP® – A Halliburton Service.

SUMMIT ESP® COLLABORATES WITH CLIENT ON A TAILORED SOLUTION

To achieve production goals, the Tiger Shark® SF320 pump was chosen for its larger shaft diameter. For the flow range, the larger shaft allows for greater torque, thus mitigating shaft breakage. The volute design diffuser provides high efficiency, while the wide vane configuration handles gas and solids more effectively. Liberator™ gas separators were used to separate as much gas as possible from the fluid prior to entering the pump. The Tiger Shark SFGH2500 gas handler was used for its open impeller stage design, which handles a higher percentage of free gas going into the pumps and requires less horsepower than competing gas handlers. For extended reliability, the Defender® super sand seal was added to this multi-technology solution. The super sand seal has exit ports located at the top of the mechanical seal to prevent the swirling effects of abrasives, which destroys shaft seals and radial bearings.



Tiger Shark® SF320 pump



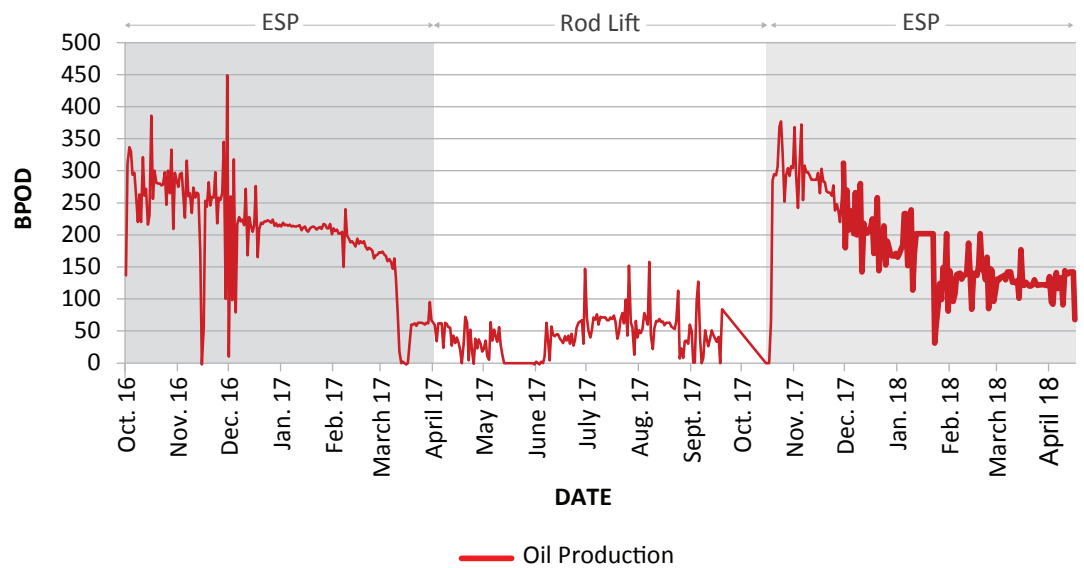
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SUMMIT ESP® SOLUTION STEADILY INCREASES OIL PRODUCTION AND REVENUE

Extensive experience in deep, low-producing wells allowed Summit ESP to achieve well drawdown better than previously used methods and to keep the production numbers up when compared to a rod pump solution. The results shown below illustrate the incremental gains when converting back to the Summit ESP technology solution. In just six months, the increased production due to the Summit ESP solution generated approximately USD 1.4 million in revenue for the operator.

Comparison of ESP and Rod Lift Systems



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