

+20% production gain, 40% energy saving

Complicating factors

- Narrow operating range of existing ESPs
- Gas content at pump intake is above 50%
- Sand content is above 1,500 ppm (1,500 mg/l)
- High DLS
- High power consumption

Results

- Oil production has been increased by an average of 20%
- Specific power consumption has been reduced by an average of 40%
- Runlife has been increased by 23%
- The runlife of UHS ESP has reached 15,000 successfully operated cycles in the well with over 2,000 ppm (2,000 mg/l) of sand content
- Total cost of ownership in comparison with competitors has been reduced by 25%

A perfect example of our Ultra-High-Speed ESP Systems (UHS ESP™) in action can be found in the group of fields, where we successfully delivered the mass implementation of this innovative technology.

The client in this case needed a significant improvement to the efficiency and safety of their oil production with the end goal of reducing their total cost of ownership (TCO). Since the start of our project with them, we have successfully installed more than 300 units.

Fields' reservoirs are found at 6,900–8,200 ft TVD (2,100–2,500 m TVD). Oil wells are drilled from well pads, ESP friendly deviated along 8,850–11,500 ft MD (2,700–3,500 m MD) and completed with 7" (177,8 mm) and 6.61" (168 mm) API casing. Downhole temperatures are ranging between 176 and 212 °F (80–100 °C).

After doing research and detailed analysis, we proposed installing several models of Ultra-High-Speed ESPs with a nameplate operating speed of 10,000 rpm:

- Low-flow rate **UHS-200** system designed for NP flow range from 50 to 280 bblpd with 190 bblpd at BEP (from 8 to 45 m³/d with 30 m³/d at BEP)
- Wide-range **UHS-500** system designed for NP flow range from 125 to 560 bblpd with 500 bblpd at BEP (from 20 to 90 m³/d with 80 m³/d at BEP)
- Power efficient **UHS-600** system designed for NP flow range from 280 to 720 bblpd with 500 bblpd at BEP (from 45 to 115 m³/d with 80 m³/d at BEP)

Upon every phase of technology deployment the client evaluated obtained results. They were found stable and consistent with prior results, allowing to development of a solid economic model.

Since 2016 **UHS ESP™** systems are approved for use in group of fields under Lex engineering support and supervision.

We offer a centralized approach to the monthly delivery of equipment for installation and maintenance, due to the compact design of our **UHS ESP™** units and minimum on-site preparation requirements. This allows us to avoid additional field workshops as the preparation of equipment can be conducted at a main repair facility and delivered directly to the field being ready for the installation (plug-and-play design).

Our results consistently demonstrate the high potential of Lex UHS ESP™ to optimize production and provide operational advantages in harsh well conditions.

UHS ESP™ advantages vs. standard equipment:

- Wide operating range provides adapting to inflow changes keeping high efficiency
- Reduction in the total length of **UHS ESP™** (by up three times) allowing passage through high DLS wells;
- Improved gas separator efficiency leads operating with 75% gas at the pump intake
- Reliable operation with sand content up to 2,000 ppm (2,000 mg/l) is possible due to wear-resistant stage materials

Implementation of Lex Ultra-High-Speed (**UHS ESP™**) technology is increasing despite oil prices drop and OPEC+ 2020-2021 restrictions. For today, we installed more than 500 units at offshore and onshore projects worldwide.