

70% energy saving, 50% total cost of ownership economy

Field in Republic of the Congo, Middle Africa

Complicating factors

- Narrow operating range of existing ESPs on unstable inflow
- Gas content at pump intake is above 79%
- Sand content is above 1,500 ppm (1,500 mg/l)
- High DLS

Results

- Operating point of the UHS ESP™ was shifted to BEP.
- SPC was reduced by 3.3 times (from 39.1 kW*h/m³/day to 11.78 kW*h/m³/day).
- MTBF was increased to 676 days. Dismantling has been carried out due to inflow absence.
- Lex UHS ESPTM provided the adaptation to instable inflow replaced 3 units of standard ESPs.
- The compact (total length is 4 times shorter) and Plug&Play design reduced on-site installation time to 1 hour.
- Total cost of ownership has been reduced by 50%.

There is a case of successful optimization of well production in complicated conditions (high gas and sand content, high DLS, unstable inflow) at field in the Republic of the Congo (Central Africa) operated by the largest oil and gas company in Italy.

The project was targeted to increase the run-life of submersible equipment and energy-saving while holding the optimum production level.

An onshore field has been developing in the Republic of Congo (Central Africa) since 2007. The reservoir is located at 6,880 ft TVD (2,097 m TVD). Downhole temperature is 216 °F (100 °C). The operated well is completed with 7" (177,8 mm) API Casing.

The previous standard ESP's MTBF was 246 days and did not provide the required fluid production. For this reason, the client has reached us to optimize the well operation:

- 1) reduce power consumption from huge 39.1 kW*h/m³/day,
- 2) steady production rate,
- 3) increase the run-life of equipment.

After a detailed analysis, we proposed installing a power-efficient **UHS-600** system designed for an NP flow range of from 280 to 720 bblpd with 500 bblpd at BEP (from 45 to 115 m³/d with 80 m³/d at BEP).

In February 2019 Lex team arrived Congo to perform a pre-installation check, train the local engineering team and conduct an installation of the **UHS ESP™**.

Due to extreme outdoor temperature in Congo, we

developed a special design of the surface equipment to maintain sufficient conditioning of the internal electronics of the VSD, because previously the client already faced the problem of overheating of interior elements and its failure.

The **UHS ESP™** installation took only 1 hour, which is 6-8 times faster than previous ESP installations on this well. This short term became possible because **UHS ESP™** is always tested at the manufacturing facility being fully assembled. After testing, **UHS ESP™** is delivered to the well site and ready for installation, consisted of MLE connection and protectolizers positioning.

The obtained results proved the high potential of Lex UHS ESPs to optimize production and provide operational advantages in harsh well conditions.