

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

Field in the 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%.

The project in the Republic of the Congo, Central Africa is the place, where we have conducted one of our most successful optimizations projects. The field has high sand and gas content, unstable inflow and high DLS which all contribute to particularly complex conditions.

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

Client has been developing the onshore oilfield 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, For this reason, Client reached out to us to optimize their well operation by:

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

Following a detailed analysis, we proposed installing **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™**.

To mitigate the extreme weather conditions experienced in the Congo, we developed special design of the surface equipment to maintain the temperature of the VSD internal electronics This solved the issue of failure due to overheating.

Installation of the **UHS ESP™** took an hour, which is around eight times faster than previous installations at this well. This is possible because the **UHS ESP™** system is fully assembled and tested at the manufacturing facility, before being delivered direct to the field. At this point only MLE connection and protectolizers positioning are required.

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