

30% power saving, the operation of the complicated wells is stabled

Fields in Romania, East Europe

Complicating factors

- Depletion of the field due to long-term oil production (over several decades)
- Unstable inflow
- Low productivity
- Gas content at the pump intake above 40%
- High power consumption

Results

- Installation time reduced by 50%
- Pump operation stabilized with gas content at pump intake around 40% due to improved efficiency of the ultra-high-speed gas separator
- Specific power consumption reduced by 30%

Romanian field is another good example of successful well production optimization in harsh conditions with high gas content and an unstable inflow. We replaced the progressive cavity pump (PCP) with Lex Ultra-High-Speed ESP (UHS ESP™) for the largest Romanian oil and gas producer in East Europe.

The project aimed to stabilize equipment operation in this depleted well complicated by a high gas content. We were also tasked with reducing total power consumption.

Our client, the largest oil and gas producer in East Europe, contacted us to improve the existing equipment operation, optimize power consumption, and decrease the installation time of submersible equipment at their field.

The oil field reservoir is located at 3,600 ft MD (1,100 m MD). The reservoir temperature is up to 194–212 °F (90–100 °C), the operating well is completed with a 7" (177,8 mm) API Casing, and reservoir pressure is below bubble-point pressure (gas forms in the reservoir).

Lex has worked on the project with the client since 2018. The client provided information on well completion, inflow performance and PVT, previous equipment operation, and well intervention history allowing Lex engineers to carefully analyze data and prepare a comprehensive design, developing solutions to solve for each existing well issue.

The previous progressive cavity pump did not meet the client's oil recovery and energy efficiency requirements. So, it was decided to replace the PCP with **UHS ESP™ - UHS-600** ESP system with

flow range from 280 to 720 bblpd at 500 bblpd at BEP (from 45 to 115 m³/d with 80 m³/d at BEP).

The Client approved our recommended approach because of the unique advantages of the **UHS ESP™** system over competitors:

- 40% wider operating range of **UHS ESP™** allows to adapt to inflow changes (avoid intermittent operation and keep it constant)
- More quickly install on-site due to Plug&Play design and 2.5 times reduced length
- Improved gas separator design allows to operate with 75% gas at the pump intake
- Reduced operating current by 1.2 times and heat generation
- Reliable operation with sand content up to 2,000 ppm (2,000 mg/l) is possible due to wear-resistant stage materials.

Following the delivery of equipment to the well by the transport company, our team of engineers supervised the system's installation and commissioning, including pre-installation checks, on-site installation, start-up, and ramping-up and ongoing monitoring to ensure stable and efficient production. Also, to help the client's engineers become more familiar with the unique technology of **UHS ESP™**, we conducted regular training both in the office and in the field

The client was delighted with the results achieved. This project has fully proven the effectiveness of Lex Ultra-High-Speed ESP (**UHS ESP™**) in complicated conditions of the field.