

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 about 40%
- High energy consumption

Results

- Installation time has been decreased by 50%
- Stable pump operation with gas content at pump intake around 40% due to improved efficiency of the ultra-high-speed gas separator
- Reduction of specific power consumption by 30%

There is a case of successful well production optimization in harsh conditions with high gas content and unstable inflow. We replaced the progressive cavity pump (PCP) with Lex Ultra-High-Speed ESP (UHS ESP™) at fields operated by the largest Romanian oil and gas producer.

The project was targeted to equipment operation stability in depleted well complicated by high gas content and reducing power consumption.

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

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).

Since 2018, we have started working on the project. The client has provided information on well completion, inflow performance and PVT, previous equipment operation, and well intervention history. Lex engineers have carefully analyzed provided data and prepared comprehensive design, demonstrating solutions to 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™** - a power-efficient **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 project because of the unique **UHS ESP™** advantages over competitors' equipment:

- 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.

After the transport company delivered the equipment to the well, our team of engineers supervised the system's installation and commissioning, including pre-installation check, on-site installation, start-up, and ramping-up, monitoring to ensure stable and efficient production. Also, to help the Client's engineers be 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.