

# ESP Flowline Water Boosting Supports Oil Recovery Project

A cost-effective and fast deployable alternative for urgent injection needs

## Challenge

A Colombian customer seeking to support urgent oil production needs, requested an efficient water injection solution as an alternative to the long lead time of traditional surface pumping technology.

## Solution

Levare provided a flexible and efficient early injection solution based on ESP products inside the surface flowline system.

## Results

The early injection of 50K BWPD had a positive impact on the oil production increase, delivering recovery of the investment in the first 30 days

- Production started 5 months earlier
- Easier and fast installation
- 40% of system cost savings
- Easy relocation to other sites

## Challenge

The client faced a 6-month delay because of the long lead times for traditional surface pumping technology, delaying operations and affecting the anticipated oil production increase.

## Solution

Levare in one month delivered an early injection system consisting of specifically configured Electric Submersible Pump (ESP) with a Permanent Magnet Motor (PMM) inside the surface water injection pipeline facility, see Figure 1.

A comprehensive analysis of the field injection requirements was conducted. For this project, it was necessary to inject 50,000 BWPD with a discharge pressure of 1,800 psi. This data was crucial for selecting the optimal ESP system and power requirement.

After performing the simulation analysis, the following design was approved:

- 2 Pumps: ESP 675-27500, 37 stage, compression type
- Motor: PL200PA, 980 HP
- Motor Seal: PB136M
- MLE: flat 562/728 UB-33
- Sensor: SPTX

By using a PMM, the power efficiency was expected to be above 92% while the operating conditions of the ESP were ideal due to pumping surface water at ambient temperatures.

Specially designed MLE exit flange at the middle of the casing allows concentric output from the discharge tubing in the casing section. The immediate availability of the ESP equipment and its straightforward adaptation to this application favored the development of this project.

The surface ESP system was dispatched from the Service Center pre-assembled, hence reducing the installation time in the field.



Figure 1

For a HPS application, the weight of the system components are not equally distributed with most of the load below the motor; therefore, the concrete foundation must be oversized according to this weight distribution.

For this ESP application inside the surface flowline, the weight is distributed more evenly along its length, requiring a concrete foundation less robust and less expensive.

## Results

The Levare ESP flowline water boosting application delivered the early injection of 50,000 BWPD, having an immediate impact on increased oil production, resulting in a full return on investment within the first thirty days.

Levare significantly reduced delivery time to just one month, allowing the customer to regain five months of production while lowering costs.

The PMM further enhanced efficiency by reducing energy consumption. And the system's flexible design, it allowed for the easy relocation to other sites once the primary HPS units arrived.

The system's design provided an initial 40% reduction of the project cost and a reduction of operational maintenance costs in future.

The project's success has led to discussions about expanding the use of this solution, reinforcing Levare's ability to deliver innovative, adaptable, and cost-effective pumping systems to meet evolving industry challenges.