

REAL RESULTS

PCP Charge Pump Improves Gas Separation and Multiphase Volumetric Efficiency

Objectives

- Improve gas separation at the pump intake and increase multiphase volumetric efficiency in a well that was running with a conventional progressing cavity pump (PCP) model 110-1600 at 250 rpm, operated at a high gas-oil ratio (GOR), 1200 scf/bbl, and 12% multiphase volumetric efficiency.
- Optimize the PCP system by reducing the temperature and the high cavity pressure at the pump discharge to avoid elastomer detachment.
- Decrease energy consumption.

Results

- Weatherford installed a charge pump model 80-1600/120-200. A downhole gauge set was placed in the wellbore to measure pressure and temperature at the charge pump intake and production pump discharge.
- After the installation of the Weatherford charge pump, the measured casing gas rate increased from 200 Mcf/d to 420 Mcf/d, a 2X increase indicating better gas separation.
- Pump multiphase volumetric efficiency increased from 15% to 80%, with a speed drop from 250 rpm to 90 rpm.

Value to Client

- Eight months after the charge pump installation, the client's well showed an 18% increase in fluid production. This production increase resulted in an additional 20 thousand barrels of oil accumulated in the eight months.
- The higher efficiency PCP system with charge pump led to a drop in operating horsepower from 38 hp to 17 hp, which equated to more than a 50% reduction in energy consumption.



Well performance before and after charge pump installation.



Discharge and intake pressure performance.

Location Venezuela

Flow Rate 270 bbl/d (42.9 m³/d)

Well Type Onshore, deviated well

Formation Eocene

Hole Size 9-5/8 in. (24.5 cm)

Hole Angle 78°

Pump Setting Depth 3,740 ft (1,140 m)

Products/Services Charge pump, MDL 80-1600/120-200

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