

Petroindependencia Reduces Liner Installation Time for Extended-Reach Wells by More Than 85%

COLOSSUS UNC uncemented liner hanger system enables rapid liner deployment with zero NPT in 25 Venezuelan heavy oil wells, saving operator USD 590,000

CHALLENGE

Streamline completion of uncemented, extended-reach heavy oil wells in unconsolidated sandstone, using equipment suitable for future thermal recovery processes.

SOLUTION

Deploy liners using 7-in × 9 $\frac{5}{8}$ -in COLOSSUS UNC* uncemented liner hanger system fitted with thermal elastomers, together with a hydraulic set and release running tool.

RESULTS

Reduced liner installation time from 10 days to 1 $\frac{1}{4}$ days on average per well with zero NPT, saved operator USD 590,000, and enabled achievement of production goals.

“This is to confirm the excellent results achieved for Petroindependencia with the Schlumberger thermal COLOSSUS UNC uncemented liner hanger system in conjunction with engineering and operational support. Hopefully this will serve to improve the design and execution of our completion operations in other fields, too.”

Luis Mata
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Extended-reach heavy oil wells present completion challenges

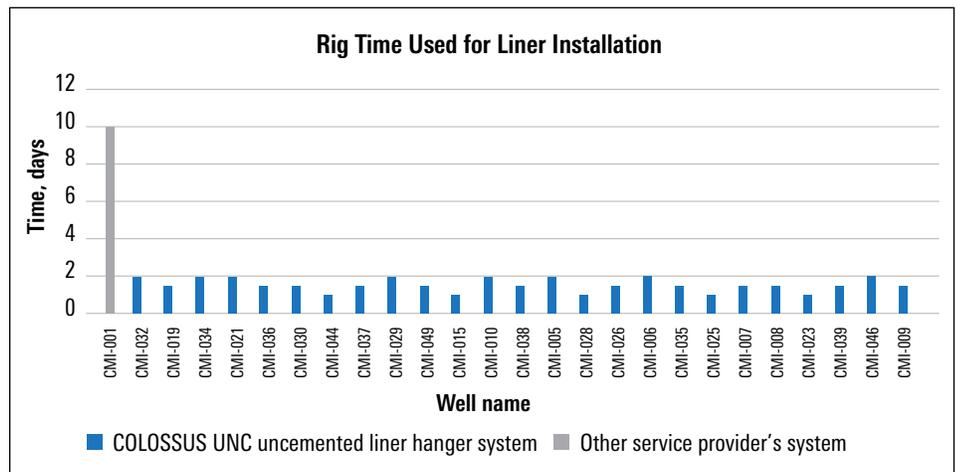
Extended-reach wells drilled through unconsolidated sandstone with shale laminations in the Cerro Negro oil field in Venezuela presented significant completion challenges for Petroindependencia, a Petróleos de Venezuela S.A. (PDVSA) joint venture. The average length of the 8.61-in diameter, open-hole horizontal sections was 4,500 ft and the maximum dogleg severity was 7°/100 ft. Successful liner deployment in these long, uncemented laterals required the ability to rotate, push, and pull the liner.

In addition, production of the heavy oil (9° API) would require steam injection during later stages of development. Consequently, all completion hardware had to be rated for the extreme conditions that were anticipated.

Service quality incidents during completion of the first well had resulted in a fishing operation, which combined with various technical limitations led to a liner installation time of 10 days. With 13 more wells to complete by year-end, the operator was on a tight schedule with little margin for error and approached Schlumberger for the remaining wells. Robust and reliable liner hanger equipment — which would translate into less rig time, lower opex, and successful achievement of completion goals — was required.

Thermal liner hanger system facilitates liner deployment

The COLOSSUS UNC uncemented liner hanger system facilitates successful liner deployment in uncemented vertical and long-reach horizontal wellbores, and it can be easily configured for high-temperature environments. The system’s push, pull, and rotation capabilities enable the liner to reach target depth quickly even in extended-reach wells. At the same time, the hydraulic setting capability avoids excessive workstring manipulation, which can be damaging in highly deviated wells. While running in hole, a large bypass area reduces the piston effect, thereby enabling higher speeds.



The push, pull, and rotation capabilities of the thermal-rated COLOSSUS UNC uncemented liner hanger system, combined with the rapid running-in speeds, reduced liner installation time by more than 85%, from 10 days to 1 $\frac{1}{4}$ days on average per well.

CASE STUDY: Petroindependencia saves USD 590,000 in completion costs, Venezuela

The liner hanger and packer are on the same mandrel and are set simultaneously, maximizing system integrity and simplifying operations. Thermal elastomers suitable for steam-injection applications were used for the packer element.

More than 85% faster liner deployment enables achievement of production goals

The 600-degF rated COLOSSUS UNC uncemented liner hanger system was supplemented with Schlumberger Completions Domain Support, which included torque-and-drag analysis and well preparation recommendations. Operations were conducted by a highly experienced team and wells were placed on production earlier than previously possible, helping the company achieve its production goals for the year. The operator has continued to use this liner hanger system; a total of 25 wells have been completed to date with an average liner deployment time of 30 hours/well and zero NPT, saving Petroindependencia an estimated USD 590,000.

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