

Long-Lateral High-Temperature Well in Permian Basin Completed in 12 Hours

DynaForce TT high-performance thru-tubing motor saves 2 rig days and associated costs, West Texas

CHALLENGE

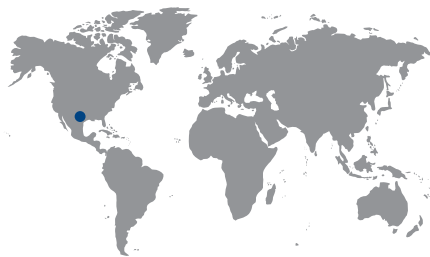
Complete an HT well with a 340-degF [171-degC] BHT and a 4,670-ft [1.4 km] horizontal section with multiple projected debris beds.

SOLUTION

Use a DynaForce TT* high-performance thru-tubing motor injected with proprietary NBR-HR elastomer to complete the job, avoiding chunking and developing debris beds.

RESULTS

- Completed the job in under 12 hours with one run.
- Milled each of 26 plugs 12 minutes per plug quicker than was predicted in prejob design calculations.
- Saved the operator 2 days compared with competitive proposal.



Avoid heat chunking and forming debris debris in long-lateral HT well operation

A customer in West Texas, USA, needed to bring a completed well into production. The final stage of the work was to mill out 26 frac plugs throughout the horizontal part of the 5½-in completion.

The first challenge was that the bottomhole temperature of the horizontal section was 340 degF, and most elastomer-based thru-tubing motors do not survive such a high temperature due to premature chunking. A competitor proposed an option that would complete the job in three runs, milling a maximum of six plugs per run while anticipating a milling time of at least 30 minutes per plug. The customer faced a total projected time of 65 hours.

Additionally, the prejob design projected that the horizontal section was long enough to create several debris beds if the flow was insufficient for debris removal through the annulus. The third party only offered a motor that could circulate at peak 3.5 bbl/min—a minimum possible flow rate. Schlumberger calculated that a successful job should have an optimal flow rate of 4.5 bbl/min.

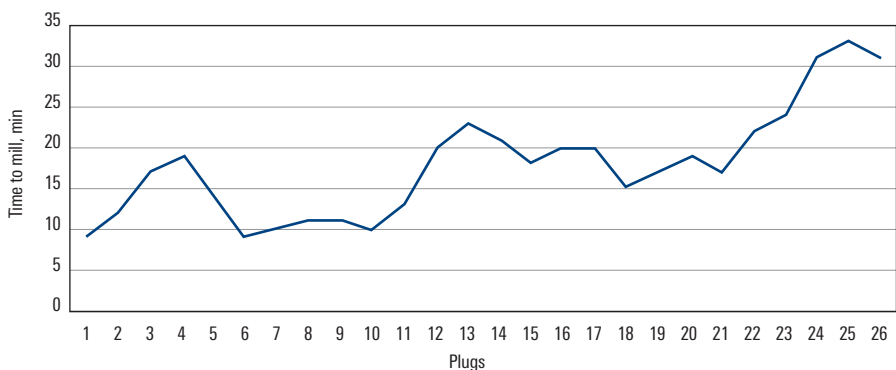
Use DynaForce TT motor assembly with NBR-HR elastomer

Schlumberger proposed a BHA combining a 3⅛-in DynaForce TT motor with a 7/8 3.3 motor injected with proprietary NBR-HR elastomer and a 3-loose fit, 2US rotor, and 10S stator. This configuration improved elastomer swelling conditions at bottomhole, providing the necessary torque for milling plugs. It also enabled the operator to continuously maintain a flow rate of 4.5 bbl/min, with peaks of 5 bbl/min if additional annular velocity is needed.

Eliminated 2 operation days and reduced costs

The operator completed the job in 12 hours with a single run, saving more than 2 days of operation compared with a third-party proposal. All the plugs were milled at an average of 18 min per plug—12 minutes quicker per plug than calculated during prejob design.

The motor experienced no stalls during the job. Postjob evaluation and surface testing of the unit revealed that the motor was in condition to complete a similar job on a subsequent well in the same pad.



On average, the plugs were milled 12 minutes faster per plug compared with the planned time.