

Operator Saves 12 Hours Using High-Torque, High-Flow Motor While Milling Cement, Saudi Arabia

High-performance thru-tubing motor enables 210-galUS/min flow rates to effectively remove cement from well, onshore

CHALLENGE

Mill a 2,200-ft [671-m] section of incorrectly placed cement from inside a 4½-in [114-mm] completion liner.

SOLUTION

Use the DynaForce TT* high-performance thru-tubing motor to mill with high torque and high flow rates.

RESULTS

- Milled and circulated the 2,200-ft section in a single run.
- Completed the milling operation 12 hours ahead of schedule.
- Saved time by eliminating stalls.



Mill 2,200 ft of cement in poorly bonded liner

A long portion of liner was incorrectly cemented during completion due to surface equipment failure. As a result, 2,200 ft [671m] of cement needed to be milled inside the 4½-in [114-mm] completion liner. The operator determined that the job would require a 3½-in- [79.4-mm] OD motor with torque greater than 1,000 ft.lbf [1,356 N] to efficiently remove the cement from the well.

The operator predicted that the torque and flow rate that the existing motor could sustain would induce several stalls, increasing the time to complete the job.

Use DynaForce TT motor to generate high flow rate and high torque

Schlumberger proposed using a 3½-in-diameter, 3.3-stage DynaForce TT motor with 7/8 lobes to complete the job. The DynaForce TT motor can provide more than 1,500 ft.lbf [2,034 N] of torque and sustain constant flow rates up to 210 galUS/min [48 m³/h].

Additionally, Schlumberger suggested using the Dyna-Drill NBR-HR elastomer, which delivers up to 30% more power compared with competitors' elastomers while minimizing the risk of premature chunking. Combined with the NBR-HR elastomer, a specially formulated adhesive enables the motor to withstand high temperatures in water-base fluid environments to eliminate the possibility of debonding.

Completed the operation in one run and 12 hours ahead of schedule

The operator scheduled 72 hours to complete the milling operation. After only 60 hours, the 2,200-ft section of cement was successfully milled, and the well was fully circulated in a single run. The cement was milled at a constant ROP of 1 ft/min with a flow rate that fluctuated between 190 and 210 galUS/min. Using the DynaForce TT motor, the operator was able to avoid all stalls and save 12 hours of rig time. Postjob surface evaluation of the motor did not show any damage to the components aside from expected wear.