

Oman

Operator completes longest cement milling operation to date with SPECTRUM[®] real-time hybrid coiled tubing service

SPECTRUM[®] real-time coiled tubing service helps set new global benchmark

CHALLENGE

- Reservoir access blocked by 4000-m cement plug
- Conventional milling required 90 days, which increased cost and risk
- Need to avoid multiple motor stalls and excessive trips
- Minimal industry precedent for milling large-volume cement removal

SOLUTION

- Deploy SPECTRUM[®] real-time hybrid coiled tubing service
- Capture real-time WOB, torque, differential pressure, depth correlation
- Allow continuous surface access to downhole data
- Optimize BHA designs based on downhole response

RESULT

- Milled 4077 m of cement, longest CT milling operation globally
- Completed in 15 runs over 30 days, 60 days faster than conventional methods
- Increased ROP sevenfold
- Achieved 87 h of continuous milling without motor stalls
- Reduced intervention cost and time by 70%

Overview

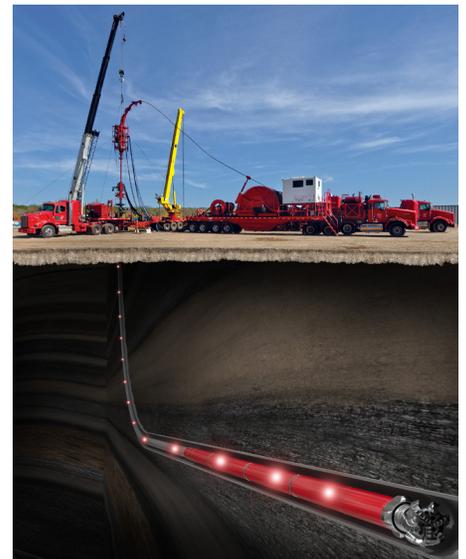
An operator in Oman encountered a major setback when an unsuccessful cement placement left a 4000-m of cement plug inside the wellbore. This obstruction jeopardized reservoir access and delayed a planned hydraulic fracturing treatment, which put the project schedule and investment at risk. Traditional coiled tubing (CT) milling methods could take up to 90 days, require multiple trips, and introduce significant operational risk.

To accelerate the operation and reduce uncertainty, the operator worked with Halliburton to deploy the SPECTRUM[®] real-time hybrid coiled tubing service. The technology integrates intervention capability with real-time downhole diagnostics, which allows the team to adjust milling parameters instantly and maintain optimal performance. The approach reduced nonproductive time (NPT), strengthened operational control, and minimized trips and motor requirements.

This project marked the operator's first use of the SPECTRUM service in Oman and set a new global benchmark for CT cement milling efficiency.

Challenge

The operator needed to regain access to total depth through the removal of a 4000 m cement plug without an extension to the project schedule or an increase to costs. Conventional milling techniques would require approximately 90 days and create risk through multiple trips, motor stalls, and elevated water and chemical use.



No industry precedent existed for milling such a large cement volume in a single well, which increased the requirement for precise control, reliable diagnostics, and contingency planning.

Solution

Halliburton recommended the SPECTRUM® real-time hybrid coiled tubing service to deliver continuous downhole visibility and dynamic parameter control throughout the operation. The service provided real-time measurements at surface, which included weight on bit, torque, differential pressure, gamma ray, and casing collar locator correlation. This insight allowed the team to optimize milling performance instantly and reduce the risk of stalls or downhole complications.

The team selected a range of bottomhole assembly configurations based on the real-time response of the well, which included junk mills, bear claw mills, and PDC bits. High-velocity friction reducers improved friction reduction and bolstered returns. A full contingency plan with multiple mill types and retrieval tools would allow the team to address stuck pipe or obstruction scenarios if they occurred.

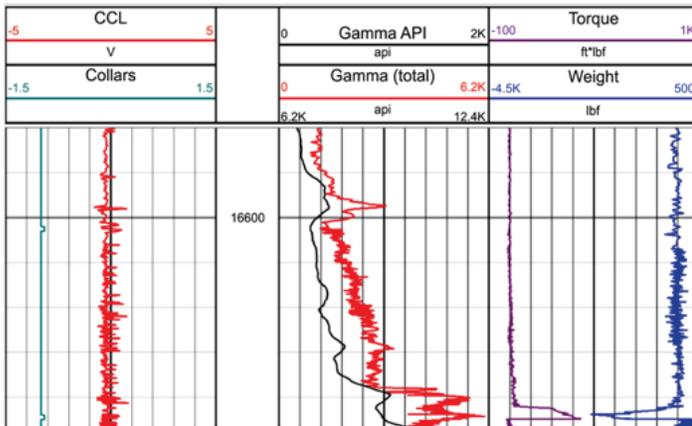


Longest recorded cement milling operation:
4077 m in 30 days



Result

The operator removed 4077 m of cement, which represents the longest CT milling operation recorded globally. The team completed the intervention in 15 runs over 30 days, which delivered a 60-day reduction compared with conventional methods. The operation increased the rate of penetration sevenfold increase and achieved 87 hours of uninterrupted milling without a single motor stall. These improvements reduced intervention costs and time by 70% and restored full access to total depth, which allowed the operator to proceed with the planned hydraulic fracturing treatment and keep the project on track.



Downhole data supplied by SPECTRUM® sensors

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