

Qatar

Record-Time Offshore Dual-Casing Cap Rock Restoration with ProMILL Duo™ Milling Tool

Optimized section-milling strategy enabled precise cap rock isolation and saved ~32 offshore rig days in Qatar

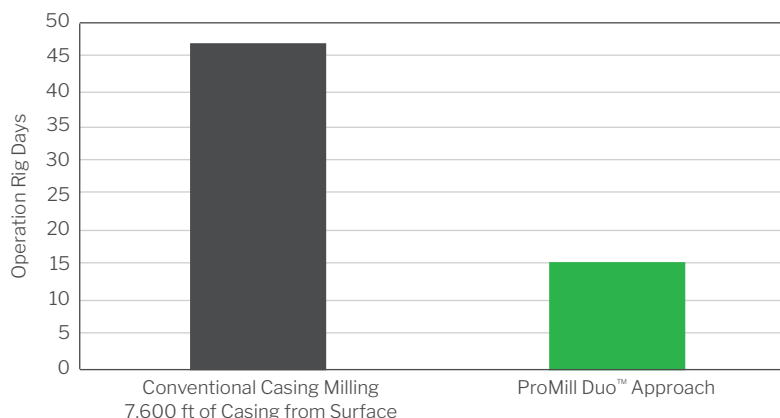
Efficient cap rock restoration is essential to long-term wellbore integrity in plug and abandonment (P&A) operations. Offshore Qatar, an operator engaged Wellbore Integrity Solutions (WIS) to evaluate the technical feasibility of restoring cap rock integrity at 7,570 ft TVD across a dual-casing string consisting of 7 in. 29 ppf L80 inside 9 $\frac{5}{8}$ in. 40 ppf C75, both cemented to surface.

WIS developed an integrated well intervention strategy by utilizing their advanced section milling solution – ProMILL Duo™ dual casing section mill technology and TruEdge™ milling inserts. This approach would improve cost efficiency while ensuring accurate and effective restoration of the cap rock barrier.

The cap rock restoration operation began with section milling 128 ft of the inner 7 in. (29 ppf) L80 casing using TruEdge inserts. The ProMILL Duo system was then deployed to mill 110 ft of the outer 9 $\frac{5}{8}$ in. (40 ppf) C75 casing in a single trip. The milling rate of penetration was optimized with efficient swarf recovery and parameters management. A formation enlargement operation was then performed over a 100-ft cap rock interval to enable effective rock-to-rock plug placement.

The ProMILL Duo system minimized intervention trips and enabled precise placement of the section-milling window across the critical cap rock interval. This benchmark performance allowed controlled milling of both the 7 in. and 9 $\frac{5}{8}$ in. casings, delivering an efficient solution for this deep offshore application.

By reducing trips and ensuring precise window placement, the integrated milling program delivered an estimated savings of approximately 32 offshore rig days compared with conventional casing milling methods.



CHALLENGE

- Restore cap rock integrity at 7,570 ft TVD across a dual-casing string (7 in. L80 inside 9 $\frac{5}{8}$ in. C75), both cemented to surface
- Need for an intervention strategy that minimizes rig time while achieving accurate and effective cap rock restoration
- Requirement to mill both strings and prepare a clean, enlarged interval for rock-to-rock plug placement

SOLUTION

- Deployed WIS advanced section milling solution to mill and underream the cap rock
- Utilized a combination of the 5500 K-Mill™ section milling tool and 6000 ProMILL Duo™ system for dual-casing section milling
- Incorporated advanced TruEdge™ milling inserts for enhanced knife performance
- Applied the 5500 ProMILL® underreamer to prepare the interval for a rock-to-rock barrier

RESULT

- Milled 128 ft of 7 in. casing and 110 ft of 9 $\frac{5}{8}$ in. casing in a single trip
- Maintained optimized milling parameters and effective swarf recovery
- Performed flawless execution of 100-ft formation enlargement to support rock-to-rock plug placement
- Reduced intervention trips while ensuring precise window placement.