

A Unique Thru-Tubing (TT) Milling Challenge in North Africa with Outstanding Results

Recent operational successes in North Africa highlight the advanced capabilities of Wellbore Integrity Solutions (WIS) milling tools, TT Motors, and TT Double Acting Jars.

Thru-Tubing frac plug milling solutions in a horizontal well with a 4½ inch 15.1# fracturing completion.

The WIS North Africa team was contacted to bring their expertise to a frac plug milling operation. The customer advised that the competitor’s performance did not meet expectations due to additional trips and lengthy plug milling times. A key consideration in this operation was also frac sleeve diameter restrictions in the completion, which increased the risk of the BHA becoming stuck.

WIS worked closely with the customer to analyze the application, assess the operational risk and determine the best solutions.

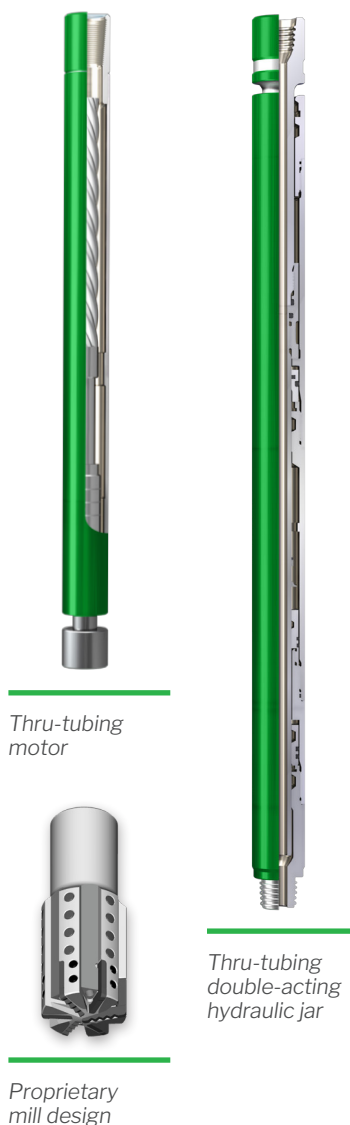
Implementation of Best Practices:

The implementation of best practices were essential in achieving operational success.

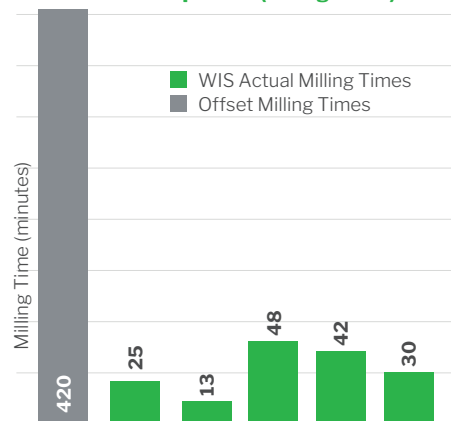
- A proprietary WIS mill design was used for the type of frac plug. Using this mill design reduced the milling time per plug from 7 hours to 30 minutes.
- The fluid system was optimized to maintain the desired underbalanced conditions and provide good hole cleaning.

Operational procedures and parameters were also reviewed to include:

- Constant weight on mill (WOM) and motor differential pressure to optimize ROP and minimize the cutting size. The WOM applied was also adjusted to reduce the risk of plug spinning.
- Exercising caution while passing through frac sleeve restrictions.
- Using the WIS TT double-acting hydraulic jar with high impact forces as an essential part of the BHA.



Performance Comparison (Milling Times)



CHALLENGE

- Improve frac plug milling time and efficiency in a horizontal multi-stage fracturing completion.
- Minimize risks of BHA sticking incidents while passing through completion ID restrictions..

SOLUTION

- Definition and implementation of best practices in terms of job planning and operational procedures.
- BHA design optimization with the inclusion of a proprietary mill design for the type of frac plug.
- Comprehensive local support with experienced personnel.

RESULTS

- Reduced average milling time with WIS proprietary mill design per frac plug from 7 hours to 30 minutes.
- Demonstrated reliability and consistency of performance.
- Reduced rig time and cost, exceeding customer expectations.

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