

## IMPROVED TORSIONAL STABILITY & DRILLING EFFICIENCY FOR ROTARY STEERABLE APPLICATION

Eddy County, New Mexico USA

**2,769**  
ADDITIONAL  
FOOTAGE DRILLED

**-61%**  
TORSIONAL  
INSTABILITY

**-95%**  
VIBRATION  
RISK

**-59%**  
MSE

TAQA's patented Threlix® is designed to assist operators in mitigating drilling dysfunctions in rotary steerable applications. Threlix balances downhole torque against weight on bit to a consistent depth of cut while eliminating stick slip and HFTO, responsible for bit DBRs, RSS, MWD and LWD failures, and unnecessary trips.

### THE CHALLENGE

An operator drilling a 6.125" lateral section in the Delaware Basin experienced elevated vibration levels which resulted in inconsistent drilling efficiency while running a competitor's torsional mitigation combo tool.

As lateral length and frictional loading increased, torsional instability became the dominant dysfunction, first evidenced by rising Surface Stick-Slip Index (SSSI), followed by increasing axial and lateral vibration risk.

These dysfunctions degraded effective energy transfer to the bit, resulting in elevated mechanical specific energy (MSE) requirement, limiting achievable footage per run despite acceptable early-section rotary performance.

### THE SOLUTION

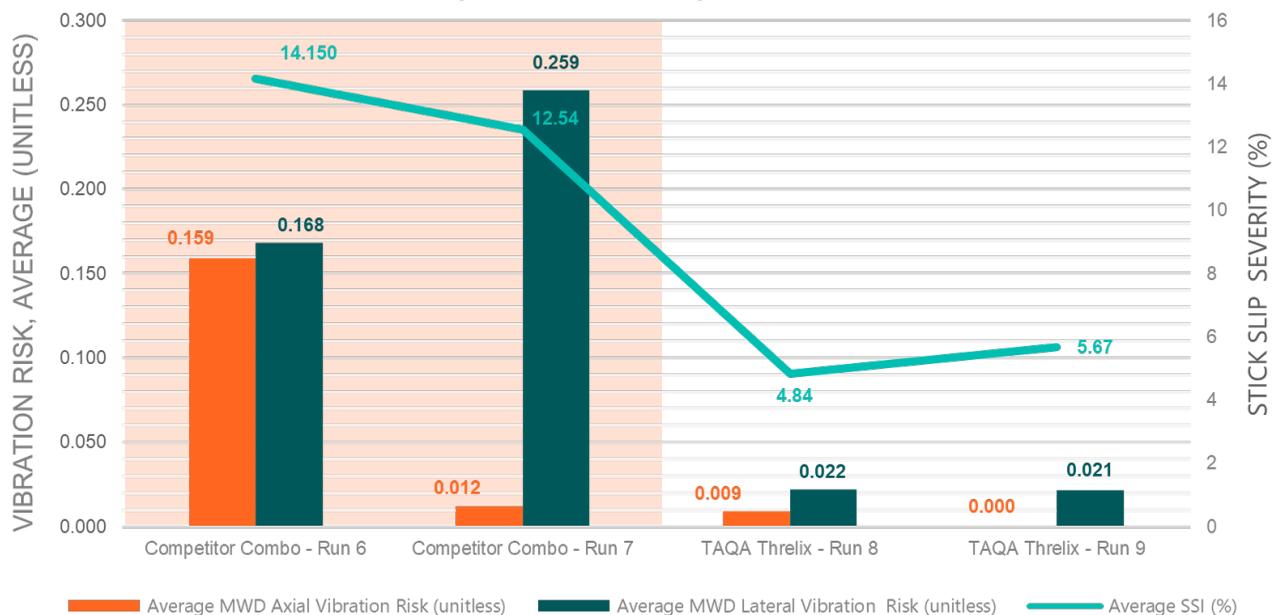
TAQA Drilling Solutions' Applications Engineering team identified torsional instability as the primary performance limiter through run-by-run analysis of drilling efficiency, vibration behavior, and mechanical response.

Based on offset performance trends, the competitor's combo tool was replaced with TAQA's Threlix to directly address torsional dysfunction while maintaining compatibility with the existing BHA architecture.

Performance was validated through direct, same-well comparisons across consecutive runs under comparable operating conditions.



Drilling Dysfunction Mitigation Overview



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### THE RESULT

- Threlix delivered higher consecutive footage, lower mechanical specific energy, and significantly reduced torsional, axial, and lateral vibration risk, while maintaining a stable rate of penetration in the 90–110 ft/hr range across the lateral interval—demonstrating effective torsional control under increasing lateral length and frictional loading
- Threlix drilled 6,586 ft across evaluated runs versus 3,817 ft with the competitor’s combo tool, delivering a net footage increase of 2,769 ft while operating farther into the lateral.
- Average SSSI decreased from 13.35% with the competitor’s combo tool to 5.26% with Threlix, representing a ~61% reduction in torsional instability, confirming improved torque control as lateral length increased.
- Threlix reduced axial vibration risk by approximately 95% and lateral vibration risk by approximately 90% (≈ 10× lower) relative to the competitor’s combo tool, indicating effective suppression of torsional-driven vibration propagation.
- Average MSE was reduced from ~141 ksi with the competitor’s combo tool to ~82 ksi with Threlix—representing a ~59% reduction, reflecting reduced torsional- and vibration-related energy losses and effective energy transfer to the bit, despite Threlix drilling farther into the lateral where increasing MSE is typically expected.

### BHA

6.125" Bit + RSS + MWD + Threlix + Motor

Footage Drilled / Run vs. Mechanical Specific Energy (MSE)

