

Shock and vibration suppressor reduces shock amplitude 64% in Permian Basin simulations

HFTO Suppressor* dampening tool simulations on the IDEAS* integrated dynamic design and analysis platform showed up to a 64% reduction in shock amplitude compared with offset wells in the Permian Basin.

Challenge

- Validate HFTO suppressor's impact on downhole drilling dynamics
 - Compare to offset wells with and without dampening tools
- Correlate IDEAS modeling to run data

Results

- Downhole data from continuous high-frequency recording tools correlate directly to predictive IDEAS analysis
- High sporadic shock peak observed in non-HFTO suppressors runs
 - Excessive shock peaks correlate to downhole tool failure
 - Shock peaks decrease by 64% relative to nondampened BHAs
 - Shock peaks decrease by 48% relative to the competition
- Lower shock peaks increase drilling efficiency and ROP
 - Constant bit-to-rock engagement

Improve BHA reliability and performance

Operators drilling shale formations in the Permian Basin experience excessive shock and vibration, specifically high-frequency torsional oscillation (HFTO). Excessive HFTO is the leading cause of downhole tool failures, including cracked drill collars, broken measurement tools, and electronic component failures, which leads to additional trips, time, and costs.

Reduce stress on the drillstring

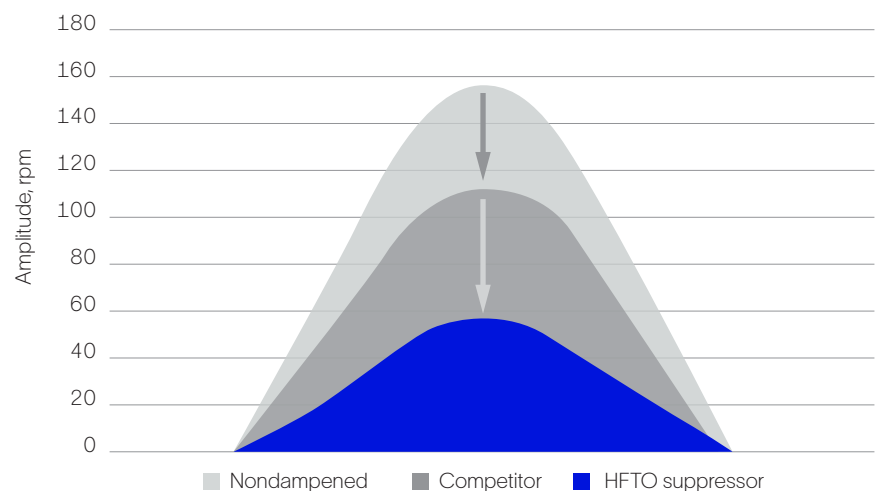
In the past, Permian operators used different types of shock and vibration dampening tools to mitigate the effects of HFTO with minimal success. Field data showed similar spikes in amplitude and frequencies between dampened and nondampened BHAs. These high and sporadic shock amplitudes resulted in costly, fatigue-induced drillstring failures, including twistoffs and broken components in the RSS and MWD equipment.

Optimize BHA for high shock and vibration

SLB developed the HFTO Suppressor tool, a mechanical tool designed to reduce downhole shock and vibration while drilling in challenging formations. Predictive modeling from the IDEAS platform simulated HFTO at various points throughout the BHA, helping SLB engineers determine the ideal location for the HFTO suppressor within the assembly.

Reduced shock amplitude 48–64%

The IDEAS platform verified the HFTO Suppressor tool would reduce shock amplitude by 64% compared with drillstrings without dampening tools. Additionally, the data revealed a 48% reduction in shock amplitude compared with other shock and vibration dampener tools. These promising results will help operators significantly reduce well time and costs by improving BHA reliability, reducing NPT, increasing ROP, and avoiding extra runs.



The HFTO Suppressor tool provides uniform shock and vibration dampening. Simulations show shock amplitude reduction of up to 64% compared with offset wells.

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