

# Case Study



## HI TOOL® Harmonic Isolation Tool run above M/LWD-RSS BHA to decouple BHA from drill string vibrations

A North Sea operator sought a solution to reduce drill string vibrations.

### OBJECTIVE

The Frank's International HI TOOL® Harmonic Isolation Tool was deployed in the 8½" section to mitigate vibration harmonics traveling from the tapered drill string downward into the M/LWD-RSS BHA. The objective was to drill the section from shoe to shoe.

### SOLUTION

It was suspected that the main source of vibrations was caused by detrimental string harmonics traveling down the drill string with the potential to accelerate toward the lower BHA. The HI TOOL® was placed just above the M/LWD-RSS BHA to decouple the drill string interference and prevent vibrations traveling into the costly BHA.

### RESULTS

In this well, with the HI TOOL® above the M/LWD-RSS BHA, both axial and lateral vibrations were greatly minimized. The section was drilled from shoe to shoe with an improvement of 31% ROP comparing to the offset well.

The PDC Bit graded 1-1-WT-A-X-I-NO-TD.

## BENEFITS

- Reduction of axial and lateral vibrations
- Smooth drilling throughout section with no NPT
- Shoe to shoe run
- Protects M/LWD-RSS BHA from drill string harmonics
- Smooth wellbore - liner run to TD without problems



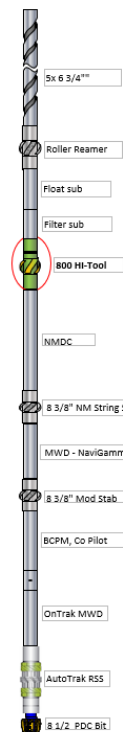
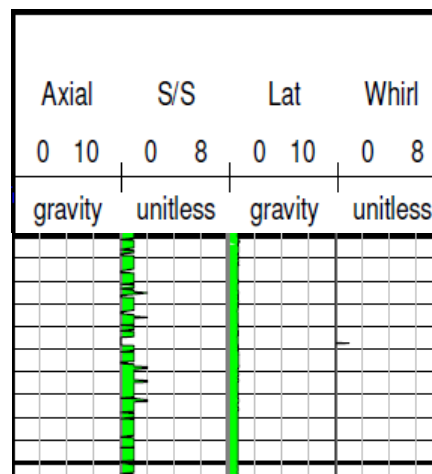
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CoPilot diagnostics overview*											
Lateral vibration			Axial vibration			Torsional oscillation (SS)			BHA Whirl		
Lev el	Cum. hrs.	Criteria	Lev el	Cum. hrs.	Criteria	Lev el	Cum. hrs.	Criteria	Lev el	Cum. hrs.	Whirl type
0	4.8		0	110.6		0	63.5		0	85.1	None
1	78.5	No limit	1	0.0	No limit	1	36.2	No limit	1	6.4	Transitiona l
2	27.3		2	0.0		2	1.9		2	4.9	
3	0.1	No limit	3	0.1	No limit	3	1.2	No limit	3	9.9	Forward
4	0.1	> 3hrs (incl. level 5, 6 and 7)	4	0.0	> 3hrs (incl. level 5, 6 and 7)	4	2.0	No limit	4	2.9	
5	0.0	> 0.23hrs (total for level 5, 6 and 7)	5	0.0	> 0.23hrs (total for level 5, 6 and 7)	5	1.9	No limit	5	0.5	Backward
6	0.0		6	0.1		6	2.4	No limit	6	1.1	
7	0.1		7	0.1		7	0.0	No limit	7	0.0	

\* Be aware that the cumulative hours displayed are estimates generated from real-time measurements ( telemetry dependent), and should be used as guideline. Final vibration/diagnostic data is derived from memory data post run. Torsional oscillation and whirl measured inside casing are omitted due to the influence of magnetic interference.