

Advanced Drill String Mechanics

Ref: SI05

Objectives

- Determination of T&D&B conditions with a detailed stress analysis in all BHA components of the drill string
- Determination of critical RPM vibrations and safe operating parameters
- Reduce the occurrence of stick-slip and whirling and improve drilling performance by combining [SI01 & SI02] with a unique time domain vibration analysis
- Post-analysis of stick-slip and whirling to identify cause for failure and/or underperformance

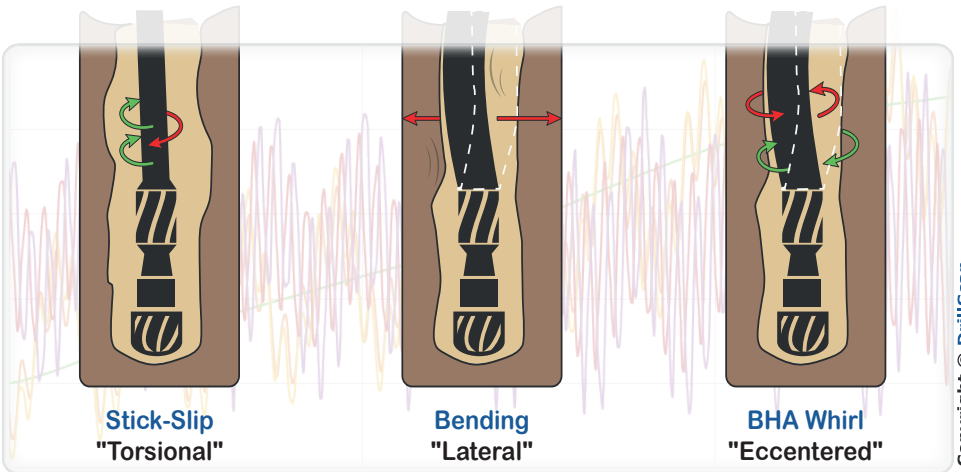
Benefits /

Pre-Well

Real Time

Post-Well

- Avoid increased drill string fatigue and associated personnel and operational safety
- Reduce number of trips due to bit failures and/or underperformance
- Improve ROP performance by ensuring optimum operational parameters (RPM; Torque; WOB)
- Reduce risk of major failures such as back-off and twist-off issues
- Improve hole condition and mitigate casing wear due to whirling and stick-slip effect



Mechanical effects of torsional and lateral vibrations on the drill string

Includes

- Unique time domain based stick-slip and whirling simulation model
- Stiff-string model including unique contact point management and side force calculation
- Mechanical and vibrational drill string - borehole interactions assessing additional torque due to whirling
- Applicable to any type of drill string (Rotary, VGS, RSS, Motor, URWD)

Deliverables and Timing

- Earliest result delivery within 20 days after reception of full and usable set of data
- Delivery of final PowerPoint® or written report within 6 weeks, intermediate reports on demand
- Result support from our most experienced Drilling Champions, upon request
- Result presentation in client's office (optional)
- Real-time support available onsite or remotely (optional)