



SoftSpeed II Plus

Enhance your top drive to reduce stick-slip oscillations.

Stick-slip oscillations are severe, cyclic variations of the drillstring twist and torque, driven by non-linear bit torque and wellbore friction. As the name suggests, the bit and bottomhole assembly (BHA) toggles between a sticking phase with zero rotational speed and a slip phase, where the BHA reaches very high peak levels, typically two to three times the mean surface speed.

Stick-slip often causes inefficient drilling and non-productive time (NPT) due to excessive bit wear, premature tool failure, drillstring fatigue, and poor rate of penetration (ROP).

NOV's SoftSpeed™ II Plus uses the latest technology to cure and prevent torsional stick-slip oscillations in the drillstring. This enhanced software improves performance and mitigates stick-slip over a wide range of conditions, including extremely long wells, where competitive systems normally fail.

The system's analyzer continually identifies, quantifies, and alerts you to torsional vibrations. If stick-slip is indicated, activate SoftSpeed II Plus and use the auto-tuning to mitigate the stick-slip.

Backed by decades of extensive research, including field tests and hardware-in-the-loop simulation tests, SoftSpeed II Plus enables safe, reliable, and improved performance in the most extreme conditions.

Upgrades

- Pipe Tally v2.0: The improved user interface allows you to classify BHA and Drill Pipe sections from the pipe tally page.
- Phase trigger feature to delay SoftSpeed II Plus activation and mitigate stick-slip at an optimal phase of the stick-slip cycle.
- Smart ramp function to avoid inducing stick-slip oscillations when speed command changes with SoftSpeed II Plus active during drilling.
- Stability detector function. The algorithm runs in the background and collects vital drilling parameters to measure the stability of the system, making SoftSpeed II Plus robust against torsional vibration induced by weight on bit (WOB) oscillation and incorrect pipe tally settings. Automatically deactivated by the "stability detector" as needed.
- Backspin mitigation detects situations when the actual shaft torque in the drillstring (i.e., the inertia-corrected string torque) exceeds the torque limit set.



Benefits

- Dampens and prevents torsional stick-slip oscillations
- Reduces axial and lateral drillstring vibrations
- Improves borehole quality
- Minimizes bit wear
- Allows higher WOB to improve ROP
- Reduces Bit/BHA/MWD failures
- Minimizes unnecessary bit trips
- Reduces top drive maintenance and drillstring fatigue
- Can be controlled from a separate screen or integrated into existing NOV control screens

Features

- Analyzer finds the correct stick-slip period
- Auto-tuning finds optimal damping parameters
- Stick-slip severity indication warns the operator of severe vibrations
- Accurately estimates bit/BHA rotation speed
- On/Off button mitigates stick-slip and prevents it from growing back
- Easy configuration with simplified pipe tally
- Trend display

Optional Services

- Daily performance reports
- Real-time data streaming with WellData™
- Monitoring
- WITS0 output

Installation

- Software upgrade of NOV AC top drives
- Interfacing with existing VFD systems
- No additional sensors needed