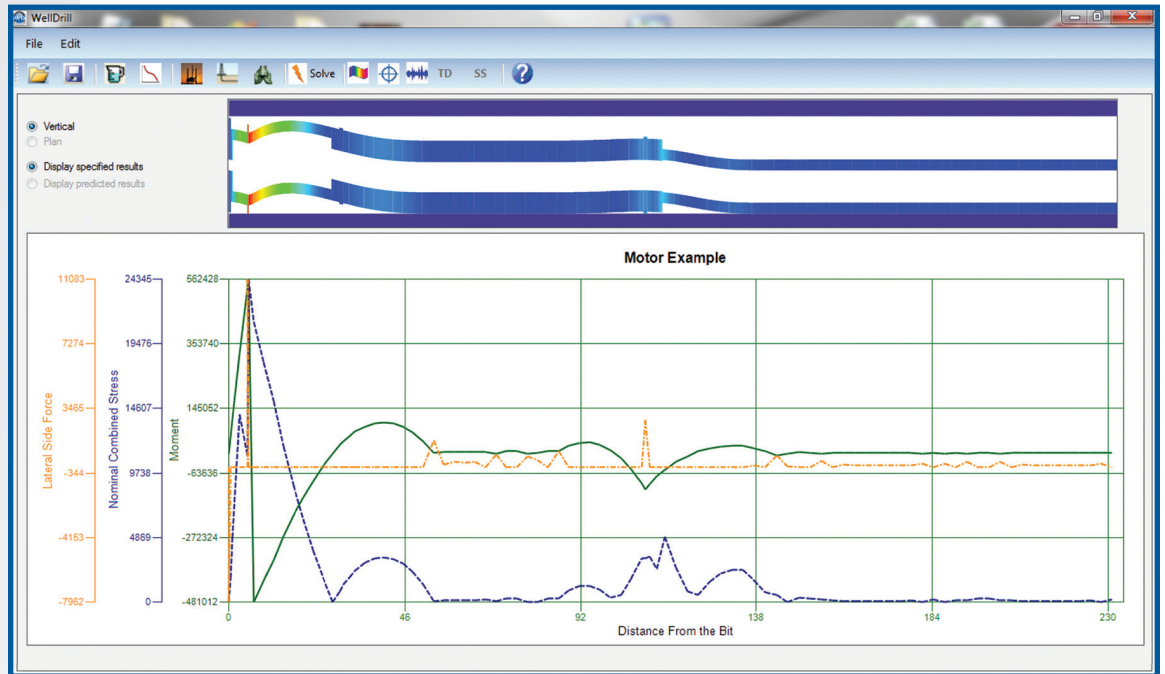


SureDrill™-Apps: WellDrill

APS Technology's WellDrill program is a member of the SureDrill™-Apps family of analytical tools designed for downhole drilling equipment. Applications include designing downhole equipment, establishing tool build rate limits and analyzing failures. Data from standard run sheets provide the necessary input. Output data are presented graphically for ease of interpretation. A comprehensive analysis can be completed within minutes. The complete WellDrill package includes the following modules:

- > **BHABend™** – Bottom Hole Assembly (“BHA”) bending analysis giving deflections, side loads, bending moments and nominal stress
- > **BHAVib™** – BHA critical speed analysis
- > **BHAPredict™** – Predicts the drill ahead drilling tendency of the BHA



BHABend

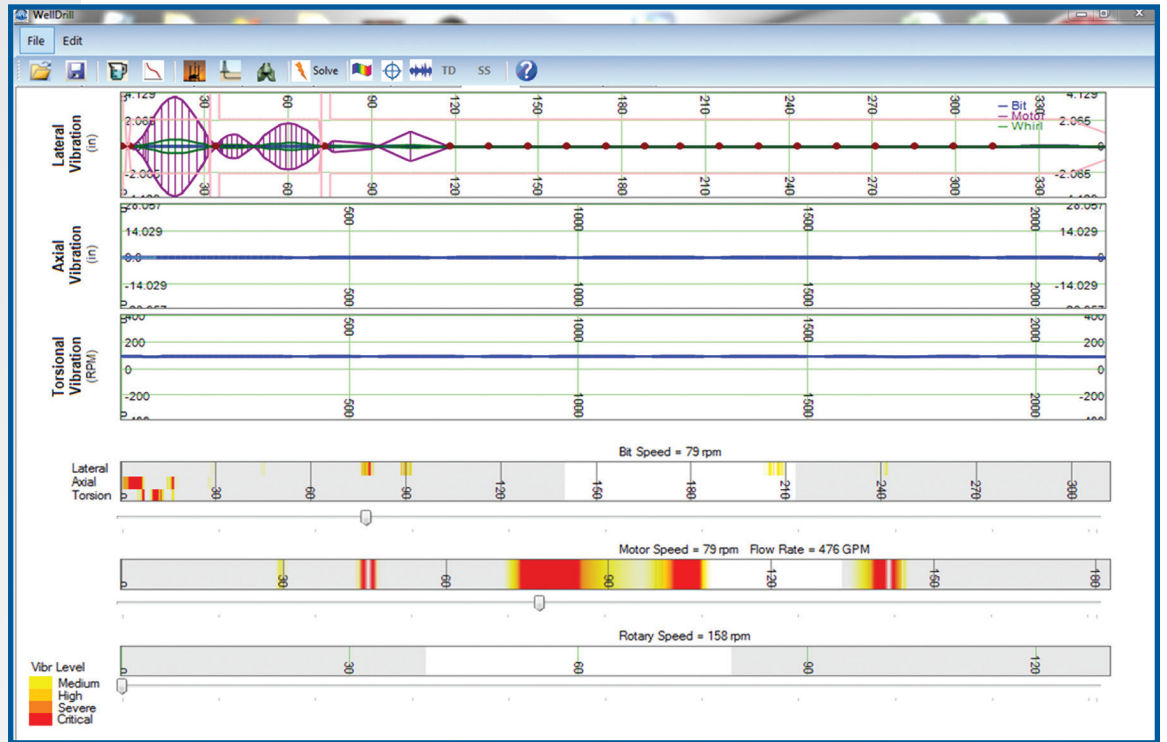
- > Calculates side forces and contact points based on the inclination, weight on bit and build rate
- > Predicts buckling within the borehole
- > Provides required input data for BHAVib & BHAPredict analyses

BHAVib

- > Predicts lateral, axial and torsional critical drilling speeds, enabling reduced vibration damage while increasing ROP
- > Displays the deflected mode shapes and natural frequencies
- > Predicts drill string response to excitation forces developed by the bit, mud motors and drill string rotation

BHAPredict

- > Predicts 3-D drilling tendencies for various types of drilling, including standard rotary drilling, directional drilling with motors and rotary steerable tools
- > Calculates the difference between inclinations and azimuth at the bit, compared to what the MWD sensor sees at a given distance from the bit
- > Includes effect on drilling tendencies due to formation dip angle



Notes:

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Rev. 160418-vC
Specifications subject to change without notice.
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