

SureDrill™

Benefits:

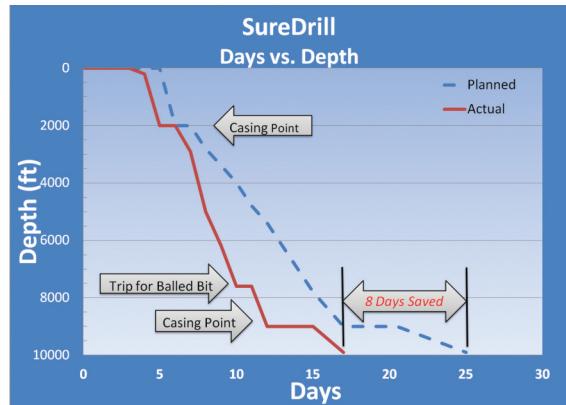
- > Increased ROP
- > Longer Bit Runs
- > Fewer Trips
- > Reduced Wear & Tear
- > Less DBR Charges

SureDrill™ Real Time Drilling Optimization

SureDrill is a drilling optimization service that combines drill string modeling with real time surface and downhole drilling data to optimize drilling parameters.

APS Technology's SureDrill service offers real time predictive, closed-loop drilling optimization that maximizes ROP and extends bit runs, resulting in lower drilling costs. ROPs increases up to 70% have been achieved on several wells. SureDrill identifies drilling dysfunctions early so the driller can take corrective action and avoid unplanned trips.

In addition to cutting drilling time, SureDrill also improves hole quality and reduces wear and tear on drill string components, minimizing redress charges.



Case Study: Drilling plan called for 25 days and two unplanned trips. SureDrill & APS:

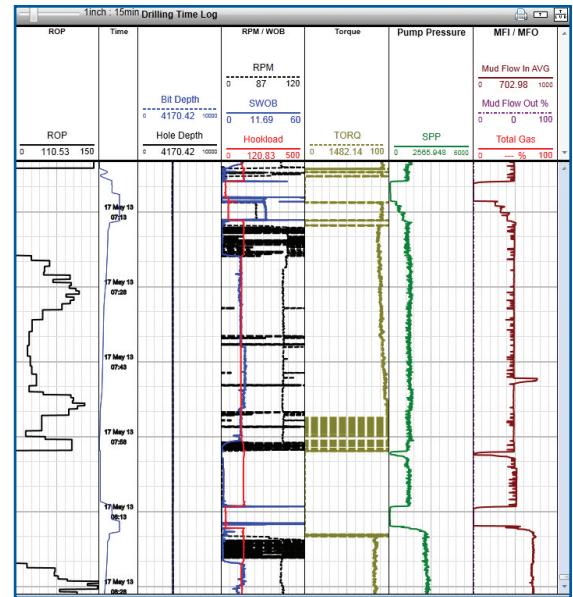
- > Saved eight drilling days
- > Correctly identified balled bit
- > Correctly recommended against bit run



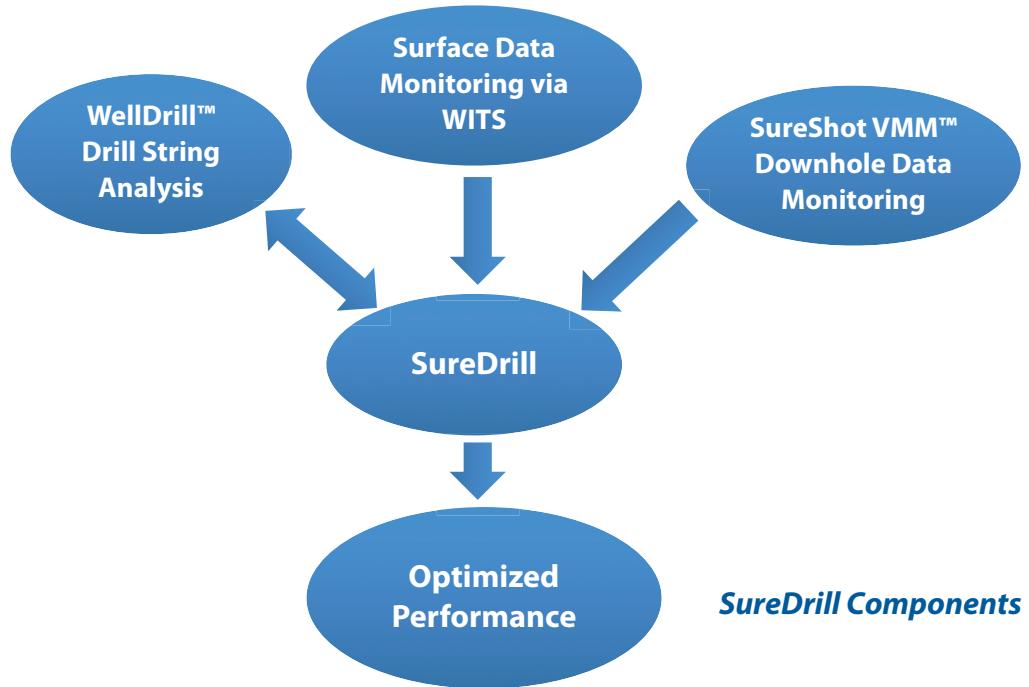
SureDrill™ Real Time Drilling Optimization

SureDrill combines drill string modeling analysis with surface and downhole data components to optimize drilling performance.

WellDrill™, APS Technology's drill string modeling program, performs the structural, directional and critical speed analysis. The SureShot™ MWD Vibration Memory Module (VMM™) provides real time and recorded shock and vibration data.



EDR Data via WITS
Powered by Petrolink



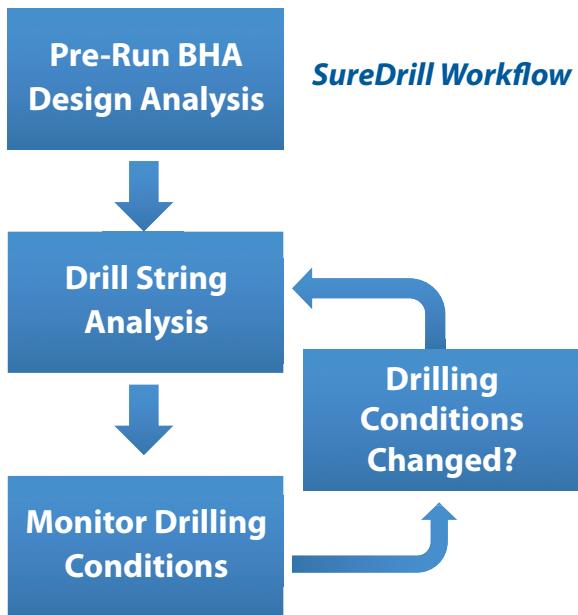
Please refer to the WellDrill and SureShot VMM data sheets for details. Real time surface data are provided by the rig's electronic data recorder (EDR) via WITS.

SureDrill™

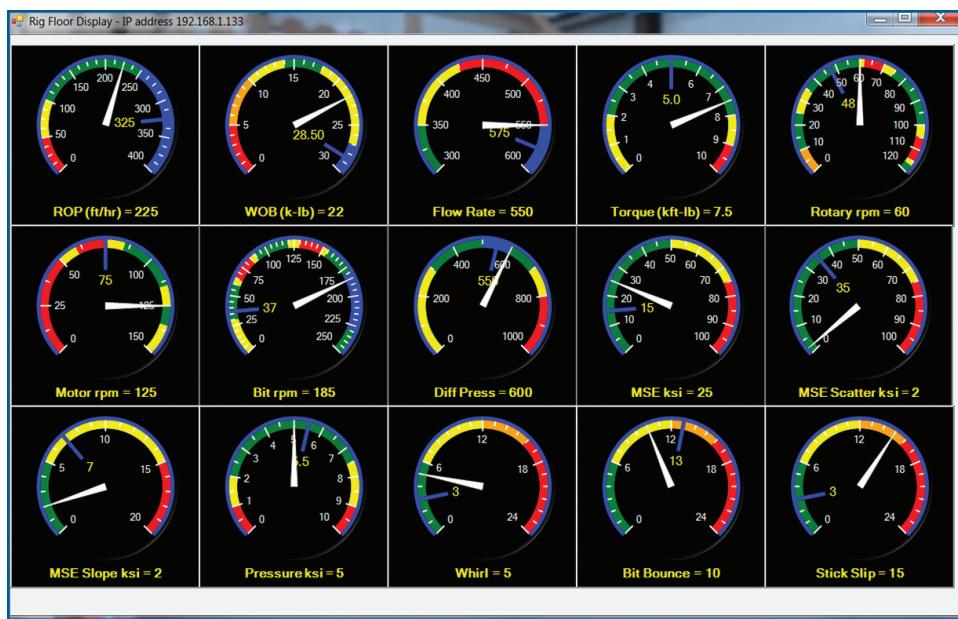


Global perspective. Independent thinking.

SureDrill's workflow continuously analyzes drilling conditions to search for the optimized set points, maximizing the cost savings. As drilling conditions change SureDrill updates the set points.



SureDrill's outputs can be viewed on rig floor displays, in the directional driller's office and off-site via remote monitoring. A gauge dashboard shows current drilling parameters, optimized target set points and combinations to avoid.



SureDrill Gauge Dashboard

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About APS's SureShot MWD System

APS's SureShot family of directional and directional plus gamma systems provides reliable and flexible measurement-while-drilling performance in combination with our second-generation Rotary Pulser. The system can be powered by our battery modules, our turbine alternator, or a combination of the two. This MWD system provides highly accurate azimuth and inclination data for all applications from straight-hole through horizontal drilling. Rapid and accurate toolface transmission enables the most complex well paths to be drilled with confidence.

SureShot's downhole portion includes a rugged directional sensor package with NIST-traceable magnetometer calibration; a reliable, field-proven, Rotary Pulser*; and battery and/or turbine alternator for power. SureShot's modular design allows the addition of other functions like high-quality gamma and/or vibration logging. Each package is protected by a state-of-the-art vibration isolation system and is mounted in beryllium copper or high-strength steel pressure barrels. A small, robust surface decoder interfaces with a computer running APS's SureShot Control Center software. The SureShot MWD can store up to 32 MB of MWD/LWD and diagnostic data for retrieval during trips.

SureShot's patented second-generation Rotary Pulser* is the toughest, most advanced, most LCM-tolerant mud pulse transmitter in the industry. Our pulser's ultra-reliable, high-efficiency DC brushless motor and controller, single open-flow path, positive pulse output and anti-jamming control virtually eliminates jamming or blockage, and the on-board memory allows post-run analysis of pulser performance. The Rotary Pulser is easily converted between fixed-mount and retrievable configurations.

The SureShot system is easy to learn, assemble and operate. In fact, APS's customers frequently train their personnel themselves to operate our system.

- > The highly reliable APS second-generation Rotary Pulser converts easily from fixed-mount to retrievable, providing fixed-mount reliability or retrievable lost-in-hole security.
- > Additional sensors including gamma, vibration monitoring and resistivity can be quickly incorporated into our "LWD-Ready" system.
- > The surface system presents data in a simple, user-friendly control and display module. The data is transferred to a central control PC from which it can be directed back to a dedicated wireless rig-floor display and/or rig monitoring system.
- > Multiple encoding schemes and advanced decoding enable rapid customization of the data stream for maximum speed or maximum data integrity.
- > The unique APS power management module enables the system to be powered through dual battery packs or a combination of battery power and APS turbine alternator †.

For more information, please see the [SureShot MWD System Technical Data Sheet](#).

* U.S. Patents #6,714,138 and #7,327,634

† U.S. Patent #7,201,239