



StethoScope

Formation pressure **while drilling**



StethoScope

- Reduced drilling expense and risk
- Mud weight optimization to avoid kicks and drilling delays
- Elimination of costs associated with premature casing runs and incorrect casing placement

Productive drilling uses real-time formation pressure measurements to reduce cost and risk—and put wells in the best place in less time.

FORMATION EVALUATION

- Fluid identification and contact
- Pressure gradient
- Reservoir pressure management
- Reserve estimation

DRILLING OPTIMIZATION

- Pore pressure calibration
- Drilling efficiency
- Real-time wellbore stability

WELL PLACEMENT

- Geosteering
- Geostopping

Today's wells are becoming more challenging—and more expensive—to drill and complete. Using the StethoScope* formation pressure-while-drilling service reduces the formation pressure uncertainty associated with drilling, minimizes the risk, and reduces cost.

The use of LWD measurements—specifically resistivity and sonic measurements—to predict pore pressure trends throughout the wellbore helps control hazards. Because these measurements are qualitative when used for pore pressure prediction, they require calibration points.

StethoScope formation pressure measurements provide real-time calibration points for pore pressure models while the well is being drilled, which significantly reduces drilling risk. Once the pore pressure is known, mud weight can

be optimized, allowing drilling to continue with confidence at optimal penetration rates.

StethoScope measurements also assist in casing point selection by fostering better understanding of the pressure in the formations around the planned casing point. Significant cost savings can be achieved by avoiding premature casing runs and incorrect casing placement.

REAL-TIME MEASUREMENTS FOR GEOSTEERING AND GEOSTOPPING

Real-time StethoScope formation pressure measurements enable geosteering and geostopping decisions based on the pressure regimes encountered. Quick decisions can eliminate time wasted drilling pressure-depleted formations and can preserve virgin pressure zones scheduled for sidetrack development or completion. Pressure and mobility data help target the most productive zones and determine the optimal drain length for horizontal wells.

In faulted formations, rapid pressure analysis aids effective geosteering between compartments.

ACCURATE DATA FOR IMPROVED FORMATION EVALUATION

Acquiring accurate formation pressure data throughout the reservoir with the StethoScope service makes it possible to analyze both virgin and developed reservoirs. In virgin reservoirs, pressure profiles can be combined with other LWD logs to develop a static model of the reservoir. Pressure profiles from wells in a developed reservoir can aid understanding of fluid movement within the reservoir.

These pressure profiles defining gradients and contact points, combined with production history and the static reservoir model, are used to model the dynamic reservoir pressure, which is crucial for optimizing recovery. The model enables an increased understanding of a field's production systems, leading to better completions.

The StethoScope service acquires quality reservoir measurements in **any hole deviation or orientation.**

StethoScope

Measuring formation pressure accurately while drilling helps put wells in the best place—in less time. Welcome to productive drilling*.

- Provides accurate real-time pressure measurements
- Permits pressure gradient definition
- Contributes data to calibrate pore pressure models
- Helps define gradients, identify contact points, and update reservoir models



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