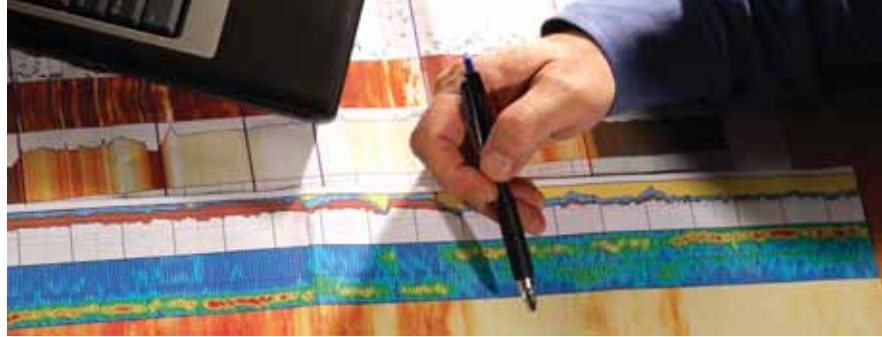


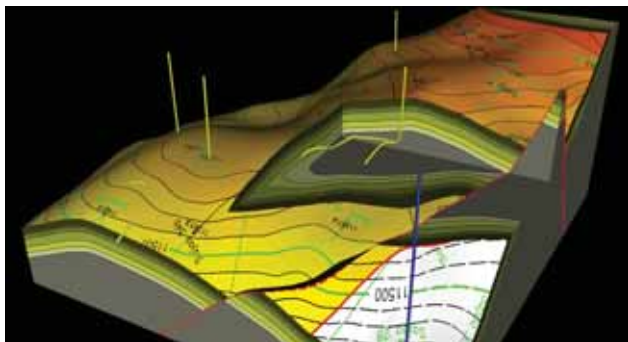
StarTrak High-Definition
Advanced LWD Imaging

ANSWERS WHILE DRILLING





DETAILED IMAGES. ACCURATE ANSWERS. RIGHT NOW.





IT'S ALL IN THE DETAILS.

A key component of INTEQ's real-time geomechanical toolkit, our StarTrak High-Definition service is designed for subsurface exploration and development teams that need highly detailed sedimentary and structural information for both wellbore placement and for geological modeling. The StarTrak High-Definition service facilitates rapid and precise geosteering and enables time critical data interpretation and recommendations, even from remote locations. The drilling and formation evaluation (FE) applications enhanced by StarTrak High-Definition imaging and data capture are far ranging, from top to bottom.

WELLBORE INTEGRITY MANAGEMENT. When wellbore stability is an issue, geomechanical visualization can deliver the answer. With StarTrak High-Definition LWD services added to the Answers While Drilling geomechanical toolkit, you can immediately see how the rock is reacting to the drilling process: directly identifying drilling-induced fractures, breakouts, shear plane failures and other drilling hazards, such as ledges. You can also assemble a time-lapse series of images—permitting a greater understanding of time-sensitive borehole degradation including the reaction of the wellbore to ongoing contact with stabilizers and other bottom hole assembly (BHA) components.

WELLBORE PLACEMENT. With the rapid decline in easily accessible hydrocarbons and the explosive increase in the costs of exploration and recovery from deeper, more complex and more challenging fields; precise wellbore placement is crucial to lowering costs,

maximizing recovery and accessing every drop of oil from mature fields. INTEQ's StarTrak High-Definition LWD service provides that precision. It allows you to refine your target location while drilling, using an accurate and up-to-date reservoir model, often located within inches of the oil/water contact. With more detailed information for bed orientation, sedimentary fabric and structural features, geoscientists and directional drilling experts can help you identify the shortest, most direct route to wellbore placement with trajectory changes fine-tuned to specific "sweet spots," such as channel sands. And, with INTEQ's unparalleled drilling expertise, you can rest assured that the well will be drilled precisely and efficiently for maximum recovery with minimal non-productive time.

STRUCTURAL CHARACTERIZATION. Information about the orientation of faults and fractures is not only vital to making the right completion decisions, but it's also critical for safe drilling. With StarTrak High-Definition images available in real time, your completion program can be continuously refined as you drill. That keeps you working, spending your time drilling rather than bringing the BHA to the surface to run wireline. The flat, dead spots on your days-versus-depth curve are reduced or eliminated.

GEOLOGICAL EVALUATION. A detailed understanding of the sedimentary environment based on high-resolution, subseismic details is key to planning a well—and accelerates the learning curve for the planning of future wells. StarTrak High-Definition images let you classify image facies in real time, supplementing the identification of the fine-scale features seen in cores.

MAXIMUM VISIBILITY MEANS MINIMIZED RISK.

The more “unknowns” in your downhole environment, the greater your risk. At risk of slowing or stopping drilling schedules to accommodate evaluation—particularly when well trajectories make coring or wireline difficult or even impossible. At risk of wellbore deterioration over time. At risk of imprecise or failed wellbore placement. StarTrak High-Definition services mitigate these risks, providing high-quality data in real time for immediate evaluation—and immediate decisions. The downhole environment is no longer invisible. It's in high definition.

Reliability under the toughest conditions.

Yet the StarTrak High-Definition service is designed to be physically invisible to the drilling process—using a rugged, integrated module right at your BHA. Neither high rate of penetration (ROP) nor demanding drilling parameters significantly limit its data quality.

High-resolution images have been acquired at ROPs in excess of 150 ft/hr. INTEQ's advanced magnetometer technology minimizes any effects of RPM variation or stick/slip. Even instantaneous rotary speed changes of $\pm 80\%$ show no degradation of its images. As a result, a constant, reliable stream of high-resolution images is transmitted in real time to immediately identify even the most subtle features. The StarTrak High-Definition LWD sub offers increased downhole memory capable of storing full-resolution images for up to eight straight days of drilling. And the StarTrak High-Definition service is engineered for full integration with INTEQ's other advanced Answers While Drilling modular components and services.

Adding another answer to Answers While Drilling.

INTEQ's suite of imaging answers already includes gamma images for wellbore placement along with density and caliper images for wellbore integrity management, with each sensor probing different rock properties and volumes. Adding the new StarTrak High-Resolution imaging technology to this portfolio—combined with major advances in while-drilling telemetry—offers another breakthrough for INTEQ's Answers While Drilling technologies, products and services.

StarTrak High-Definition services are also fully compatible with INTEQ's industry-leading AutoTrakSM rotary steerable system, allowing geosteering with precise inclination and azimuthal control. INTEQ's CoPilotSM drilling optimization services support optimal ROP and significant improvements in borehole quality, helping eliminate the drilling dysfunctions that cause borehole rugosity. And when combined with wired pipe and the IntelliServTM Network, StarTrak High-Definition images and other MWD and LWD data are transmitted at nearly unrestricted bandwidth—providing real-time logs virtually indistinguishable from memory data.

In addition, INTEQ's Answers While Drilling services provide immediate expert geoscience interpretation and advice, both on site and around-the-clock via a network of expert collaboration centers worldwide.

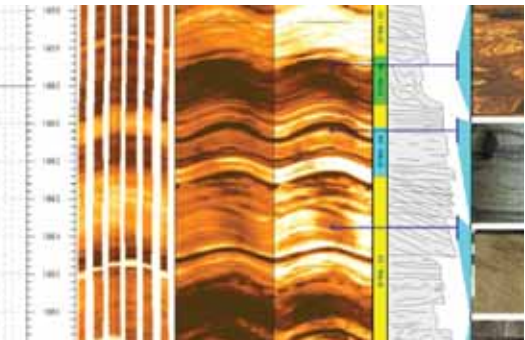
StarTrak High-Resolution advanced LWD imaging delivers the real-time images INTEQ's clients need for accurate and reliable Answers While Drilling.

>To learn more about StarTrak High-Definition services—including third-party papers about high-resolution imaging applications—visit www.AnswersWhileDrilling.com, contact INTEQ at 713.625.4200 or e-mail StarTrakAnswers@INTEQ.com.

borehole breakout? What is the borehole width? What orientation is the breakout? Is there drilling induced fracturing? What orientation is the fracturing? Is there potential for ledge formation? Is there potential for failure? Is the borehole washed out? Are there fractures/faults crossing the wellbore? Where are the fractures/faults? What is the damage zone width? What orientation are the fractures/faults? What types of fractures are there? How many fracture sets are there? What's the structural dip? What's the dip and azimuth of a bed boundary? What's the dip and azimuth of features within a bed? Can I perform a detailed analysis of the image? Can I perform an image facies analysis? Lithofacies associations? What is the depositional environment / sedimentary interpretation? Can I see irregular features such as slumping and injection? Are there nodules, concretions, or other features? Where are they? What's the true thickness of the reservoir? What's the net-to-gross? What's the true hydrocarbon saturation over an interval? Where should I take my formation



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INTEQ, a division of Baker Hughes, is the industry leader in innovative, automated directional drilling and real-time formation evaluation services. These services form the basis of INTEQ's Answers While Drilling, offering new solutions at the farthest reaches of drilling depth, complexity and range. Answers While Drilling integrates advanced drilling and evaluation services, designed to deliver real-time answers from accurate and reliable while drilling information. These answers allow operators, geoscientists and drilling personnel to make informed drilling decisions on the spot, leading to fast and accurate well placement, enhanced drilling efficiency and maximum recovery.