INTELLICESS REAL-TIME SOLUTIONS HELP IMPROVE DRILLING PERFORMANCE AND REDUCE COSTS

INTELLICESS
OPTIMIZED REALTIME INTELLIGENCE

In today's challenging wells, a multitude of downhole and surface sensors produce more drilling data than ever before, and drilling engineers are being tasked to make instantaneous decisions based on this data. The Sentinel RT™ system from Intellicess cleanses, processes, and analyzes massive amounts of data quickly and accurately—and helps turn data into actionable information. This enables your rig and office personnel to make confident drilling decisions immediately to improve drilling efficiency, reduce invisible lost time (ILT), and deliver optimal wellbores. Sentinel RT is powerful, fully customizable and can be tailored to the specific needs of your unique ecosystem and workflows.

ON-SITE

CORPORATE HEADQUARTERS

IN THE CLOUD

Tools for Drilling Optimization

IMPROVE DECISION MAKING WITH BELIEF-BASED ALERTS

People form beliefs about conditions based on life experiences and external information. Beliefs can help people make decisions and provide a foundation for how they react. The Sentinel RT system is an AI- (artificial intelligence) based belief engine that helps identify and understand drilling dysfunctions and drilling parameters, including weight-on-bit (WOB) and equivalent circulating density, torque and drag (T&D), washouts, stuck pipe, kicks, lost circulation, and more. This system provides non-stop guidance and intuition. It's your expert advisory system that never takes a break and works in conjunction with your drilling teams.

ADVISORY METHODS TO HELP GUIDE THE PROCESS

It's easy for drilling optimization applications to send alerts and notify drillers of potential problems, but these don't necessarily help drillers decide what to do next. The proprietary Cone Drilling™ advisory system identifies drilling dysfunctions and provides a path for improvement. When used with the Sentinel RT system, Cone Drilling offers the drilling engineer suggested parameter settings for WOB, RPM, and flow rates for optimal drilling. When a drilling dysfunction is identified or the ROP can be improved, a cone appears on a live WOB-RPM cross plot. The cone points the way and guides the driller in the direction of improved performance.

Tools for Hazard Avoidance

TORQUE AND DRAG, STUCK PIPE

Excessive T&D is often a limiting factor when pushing lateral lengths in horizontal shale wells. Measuring T&D as it's happening is not easily accomplished as it requires merging up-to-the-minute and contextual data of dissimilar frequencies and quality, along with repeated calibration to achieve trusted results.

The Sentinel RT system automatically generates T&D models using both contextual information and instant drilling data. It provides broomstick plots and real-time field data tracking for pick-up, slack-off and rotating off-bottom weights. The system utilizes a T&D model to automatically alert rig and office personnel of overpull and underpull events and to record the depths at which these events are occurring. While tripping, these early warnings provide your rig crew with timely information to help avoid excessive pipe wear, drilling equipment damage, and stuck pipe. It determines openhole and casing friction factors. It can also perform sensor calibration and uses real-time broomstick plotting and field data comparison to help with subsequent casing run planning and design.

DETECT WASHOUT AND PUMP FAILURES EARLIER TO REDUCE COSTS

The risk of equipment failures while drilling can be minimized with a robust detection and alerting system. The Sentinel RT solution tracks drillstring washout and pump failure possibilities. It also provides early alerts so you can proactively address problems and minimize nonproductive time (NPT). The system uses a Bayesian network that aggregates data from rig floor sensors, contextual information, and predictions from hydraulic models. The network then determines a probabilistic belief system indicative of drillstring washouts and mud pump failures. Using past and present trends, the system continuously increases its accuracy through self-learning and self-calibration. It will adjust for

poor sensor data, drilling conditions, and model uncertainty. The result is a set of alerts that you can trust and act on to reduce the likelihood of costly failures.

A Foundation for Solid Performance

RUN ANALYTICS WITH CONFIDENCE

Feeding unreliable and suspect rig data into data models can result in faulty alerts, reduced efficiency, and notifications from event detection algorithms that can't be trusted. By using a Bayesian network to connect all possible sensed variables, the Sentinel RT system's algorithms can differentiate between a sensor and a process fault, identify outliers in data and missing data, and correct for sensor bias. The system's sophisticated data cleansing methods provide confidence in data quality, so you can concentrate on improving drilling performance and reducing ILT.
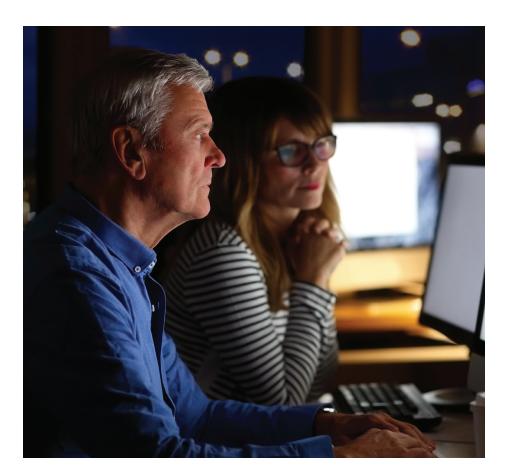
ACCURATE RIG-STATE DETECTION

Automated rig-state detection is essential in identifying and understanding ILT and driving performance improvement. The Sentinel RT system automatically detects 17 rig states that are critical inputs for drilling models and algorithms. With 98% accuracy, the system determines your rig's current operational status. These states include:
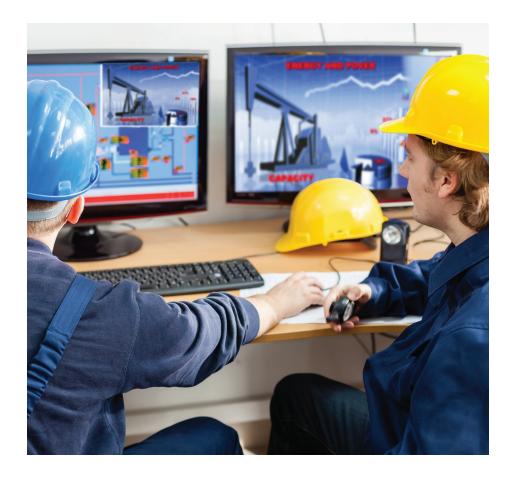
- Rotary or slide drilling
- Tripping in or out with or without circulation
- Making connection during drilling, tripping in, tripping out
- Reaming and back reaming
- Conditioning, circulating, or breaking mud
- Pressure testing
- Static, out of hole, and undefined

A SYSTEM BUILT FOR SPEED

Effective real-time systems must run at extremely fast rates while using minimal computational resources. Improvements in drilling rates and a proliferation of additional rig sensors create a massive volume of well data that must be rapidly and accurately

processed. Built for speed, the Sentinel RT system can analyze a 40-day well in a single day on a standard desktop computer. Because speed is essential when analyzing data from historical wells, Intellicess continues to improve and streamline the Sentinel RT system's data processing algorithms to run even faster and more efficiently.

ACCESSING THE POWER OF DRILLING DATA

Over the past decade, the drilling industry has been inundated with new downhole and surface sensors that are producing more real-time drilling data than ever before. However, operator efforts to realize the benefit of this new information in terms of cost and time savings has been frustrated by the industry's inability to cleanse and analyze these vast amounts of data.

Adding the Intellicess Sentinel RT system and Cone Drilling tool to your existing rig systems breaks down that barrier and allows you to use sensor-driven information in a meaningful way that enhances the productivity and economics of your drilling operations.

The intuitive drilling advisory platform uses advanced edge analytics software and runs on any operating system. Its belief methodology mimics the way humans make decisions to provide a calculated basis for decision making. You get a set of fast and effective instantaneous tools for improving drilling efficiency, reducing ILT, and driving drilling performance. Contact Intellicess today to learn how our solutions can work for you or visit www.intellicess.com.

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