



DRILLING

“Do my drillers have the current, accurate mud returns data they need to quickly identify and react to well control events?”

Collecting density and flow rate data in real-time is helping to lower drilling costs by reducing nonproductive time (NPT) and identifying leading indicators to potential operational problems, which contributes to real-time drilling optimization.

Source: Source: Jason Norman, independent consultant for Apache Corp, “Coriolis sensors open lines for to real-time data”, www.drillingcontractor.org, Sept 2011

What if...

- You could significantly **increase the safety and reliability of drilling**, tripping and cementing of well operations, and reduce time spent flow-checking?
- You could quickly and easily **improve drilling efficiency and reduce cost** by maintaining designed hydrostatic at the drill bit and reducing drilling fluid losses?
- You could **verify data integrity** with advanced diagnostic information and receive alerts to changes in meter performance without taking the unit offline?

How can you operate more efficiently with improved visibility on well control events?

The ability to efficiently manage your drilling operations is critical to your well’s economic success; however, the need to operate safely, especially through critical sections of the well, can slow down your operations for repeated flow checks. With deepwater drilling pushing new frontiers of temperature and pressure, drilling costs (and risks) are greater than ever. Onshore-intensive drilling programs demand efficiency to remain economic all the while experienced personnel is increasingly difficult to find and retain.

Lack of accurate, timely information concerning volume loss or influxes in the wellbore slows down your operation and hampers the drilling crew’s ability to efficiently react to changing wellbore conditions. Because mud volume calculations are usually handled manually, you have an inherent lack of reliability in your operations that impact both your bottomline and your confidence in safe operations.

Drilling managers we talk to tell us about challenges like these:

“Current methods of measuring drilling mud returns are unreliable.”

Flapper and flow paddle measurements of mud flow and pit volume are notoriously inaccurate, particularly when mud density and viscosity is changing. Level measurements can be deceiving on floaters or drillships thanks to high seas or shifting loads on the deck. When drilling a critical section, it can be difficult to identify changes in volume-in versus volume-out and respond in a timely manner, resulting in frequent flow checks. This uncertainty in measurement can slow down your operations and waste critical minutes at the onset of a well control event.

“I’m always under pressure to improve drilling efficiency and reduce NPT.”

Manual processes, such as tracking volume-in versus volume-out, introduce inconsistencies, errors, and delays into your operations. They also make you overly-dependent on your employees. In the current environment, employee turnover is high, and training new employees to compensate for attrition can be a difficult, lengthy process.

“Lack of visibility to continuous drilling returns data hampers efforts to provide real-time support to my drilling operations.”

Providing remote technical decision-making support is critical as the industry is drilling deeper, hotter and at higher pressures than ever. Poor or inadequate data on drilling mud density and flow in versus out can blind your technical support, halting or interrupting your drilling operations.



DRILLING

Working with Emerson will help you overcome challenges related to drilling mud measurement during your drilling and cementing operations. Our products and solutions can help you reduce measurement uncertainty and assist in automation of your processes so you can improve your early kick and lost circulation detection—increasing the efficiency of your operations. All of this will help you make informed decisions on future drilling plans, deliver well programs on time, and maintain a safe, environmentally sound drilling operation.



HAVE CONFIDENCE IN YOUR MEASUREMENTS

You can greatly reduce measurement uncertainty when you work with Emerson. Our meters allow you to continuously take both density and flow rate measurements of drilling mud returns regardless of mud type. You will have the ability to accurately detect small volume changes down-hole, immediately, on the surface. This allows any kick or loss to be handled quickly and safely, minimizing downtime due to a larger event, which saves overall cost to drill the well. You'll also have access to technology and diagnostics that will give you accurate assessments of your meters' performance, so you can be sure you have accurate measurements to assess and adjust drilling operations.

OVERCOME EQUIPMENT LIMITATIONS

You'll overcome limitations associated with conventional and traditional equipment. Micro Motion Coriolis meters accommodate changes in mud rheology and density without the need to recalibrate or estimate fluid velocity profiles while maintaining consistent repeatable readings, independent from floating rig heaving or mud pit transfers. Our meters offer the broadest and most accurate operating range of any metering technology available for drilling mud. Free yourself from the operating restrictions and excessive maintenance of traditional metering and gain the ability to continually assess the health of your meters and processes, while reducing uncertainty in your drilling. Coriolis meters require no maintenance or replacement and Smart Meter Verification allows you to receive alerts to changes in meter performance without taking the unit offline.

“Coriolis meters provide improved kick detection capability compared with conventional overbalanced drilling”

Source: B. Patel, “The Application of Advanced Gas Extraction and Analysis System Complements Early Kick Detection and Control Capabilities of Managed Pressure Drilling System with Added HSE Value”, SPE156908, 2012

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