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EXHIBITOR: SCHLUMBERGER STAND: 4330 HALL: 4

SHIFTING DRILLING OPERATIONS FROM REACTIVE TO PROACTIVE

New service detects formation features ahead of the bit while drilling, reducing drilling uncertainty and optimising casing and coring point selection
 Contributed by Schlumberger

Recent technological advancements have enabled drillers to detect reservoir complexity behind the bit. But when it comes to detecting formation features ahead of the bit, drillers have had to turn to conventional methods such as drilling a pilot hole or relying on seismic data and reservoir modeling. While generally effective, such methods are reactionary and dependent on auxiliary activities that interrupt drilling.

Today, drillers have another option that enables more proactive decision making while drilling: the IriSphere* look-ahead-while-drilling service from Schlumberger. This innovative service accurately detects formation features ahead of the bit while drilling wells, helping operators reduce drilling risks by telling them exactly when and where to stop. With the look-ahead capability, the IriSphere service helps the customer shift from reacting to hazards while drilling to proactively managing them. This ultimately improves drilling efficiency; reduces drilling risks and contingencies; and reduces, optimises and eliminates casing sections.

The IriSphere service represents the industry's first application of electromagnetic (EM) technology, combining deep directional measurements with advanced automated inversion.

The real-time capability is delivered while drilling by using a multifrequency transmitter and multireceiver directional subs. EM signals are sent from the transmitter into the formation more than 100 ft [30m] ahead of the drill bit and retrieved by the receivers to enable the enhanced look-ahead sensitivity and

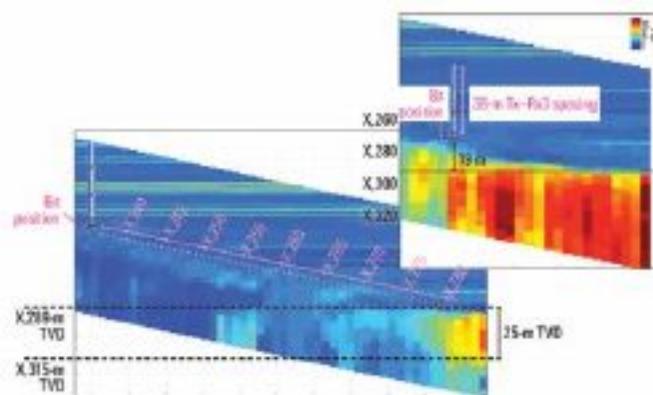
resistivity profiles. Measurements are compared to a prepared model that incorporates offset and other data to reveal a true downrange representation of the formation while drilling.

Reducing drilling risks, contingencies and NPT

The IriSphere service addresses drilling uncertainties such as unseen formation features with potential pressure differentials for integration in a standard pore pressure prediction workflow. Another common risk is penetrating a high-pressure reservoir that might result in stuck pipes, lost circulation and other potential wellbore instability issues. Additionally, a true look-ahead-while-drilling service can enable real-time mud properties management and optimised casing design and contingencies planning that reduces nonproductive time (NPT) and drilling costs. Unlike the current geostopping technology available in the industry, IriSphere service differentiates between a thin high-resistivity stringer and a target reservoir. Consequently, premature casing seating or coring location is avoided.

Case study

An operator drilling an appraisal well in a new block offshore Western Australia faced several challenges. The field had a complex stratigraphy because it was on an anticline and was composed of siltstones between discontinuous sand bodies. Confirming the presence and thickness of the reservoir in an unexplored part of the field was crucial, given the reservoir was characterised by a lack of markers above it and several meters of seismic uncertainties. The IriSphere service was



The IriSphere service detected the top of the reservoir at 19-m [62.33-ft] ahead of the bit. At 7 m [23 ft] ahead of the bit, the reservoir thickness was verified at 25-m [82.02-ft] TVD. (Courtesy of Schlumberger)



deployed rather than using the conventional approach of drilling a pilot hole and then performing a sidetrack for coring operations. It revealed the reservoir top at about 19-m [62.33-ft] TVD ahead of the bit, and the 25-m [82.02-ft] reservoir thickness was ascertained at 7-m [23-ft] TVD ahead of the bit. This enabled the

operator to avoid drilling a pilot hole and reduced overall drilling risks, while maximising reservoir exposure to improve accuracy in landing the well.

To learn more about IriSphere look-ahead-while-drilling service, visit Schlumberger booth 4330, Hall 4, to speak with an expert.

*Mark of Schlumberger