

Operator Maximizes Asset Value in Extreme-High-Temperature Wells

QUASAR TRIO® M/LWD TRIPLE-COMBO SERVICE REDUCES WELL TIME IN 24-SLOT PLATFORM OPERATION

OFFSHORE THAILAND

CHALLENGES

- » Evaluate gas reservoirs and unproven gas reserves in mature offshore field
- » Drill to deep TVD in an area with extreme-high-temperature gradient, and circulating temperatures at depth higher than the operating temperature limit of conventional high-temperature LWD tools
- » Complete 24-slot platform as time-efficiently as possible

SOLUTION

- » Quasar Trio® M/LWD triple-combo service – rated to 392°F (200°C)

RESULTS

- » Gathered real-time formation evaluation data to enhance reservoir understanding and improve timely decision making
- » Drilled to well TD of between 10,000 feet and 11,000 feet (3,048 meters and 3,353 meters) TVDSS with maximum drilling parameters
- » Eliminated requirement for dedicated wireline runs, thus reducing well time by approximately 14 percent of total rig time, lowering costs and maximizing operator asset value

OVERVIEW

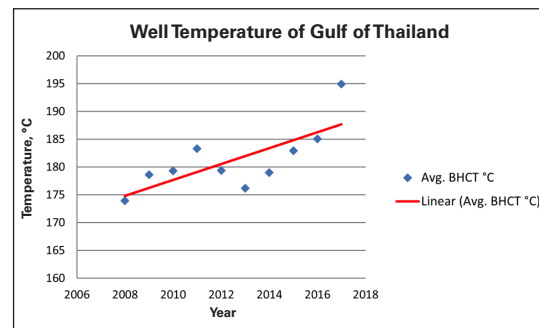
A major oil and gas operator wanted to reinvigorate a mature field offshore Thailand by further exploiting and producing deep gas reservoirs and evaluating unproven deeper gas reserves. To drill these challenging wells, a formation evaluation would need to be conducted using measurement-while-drilling (MWD) and logging-while-drilling (LWD) technology.

However, the notoriously high downhole temperature in the Gulf of Thailand, with a maximum bottomhole static temperature (BHST) on the platform of 425° F (218°C) and a temperature gradient of 2.9°F/100 feet (30.5 meters), rendered conventional high-temperature M/LWD tools incapable of performing the job.

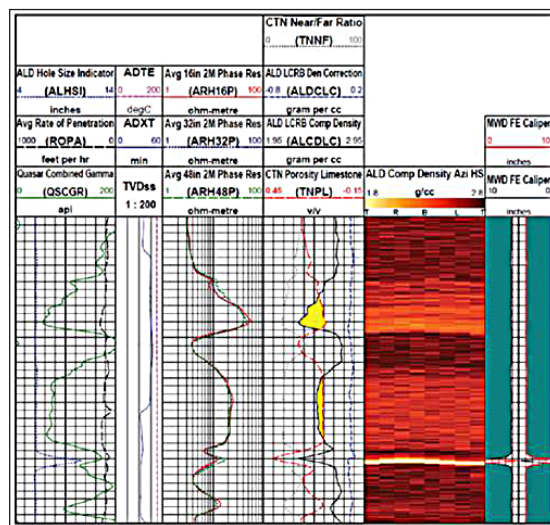
Halliburton Sperry Drilling recommended the Quasar Trio® M/LWD triple-combo service, which could deliver real-time formation evaluation data and withstand prolonged exposure to extreme downhole temperatures. This enabled the operator to lower project costs by eliminating wireline logging runs, reducing rig time and maximizing overall asset value.

AN ENGINEERED DRILLING SOLUTION FOR EXTREME-HIGH-TEMPERATURE ENVIRONMENTS

Sperry Drilling engineered a drilling solution to help the operator meet the challenges of extreme-temperature downhole conditions. The Quasar Trio M/LWD triple-combo service allows geologists and petrophysicists to acquire and analyze formation



Graph showing the average of the top 20 hottest wells per year offshore Thailand.



Real-time formation evaluation data gathered from the Quasar Trio® M/LWD triple-combo tool.

evaluation data while drilling. Its rugged sensors measure resistivity, density and neutron porosity, and are designed to survive in extreme temperatures of 392°F (200°C) and harsh downhole environments. The delivery of a comprehensive set of petrophysical measurements and real-time formation evaluation data helped enhance the operator's reservoir understanding to evaluate potential deep pay in real time, and, ultimately, to make sound business decisions regarding long-term overall asset viability.

SUCCESSFULLY DRILLED 24 HIGH-TEMPERATURE WELLS MAXIMIZING ASSET VALUE

Utilizing this technology, the operator drilled 24 high-temperature wells efficiently (in two "continuous" batches) on the platform, to a total depth (TD) of between 10,000 feet and 11,000 feet (3,048 meters and 3,353 meters) true vertical depth subsea (TVDSS). By eliminating dedicated wireline runs, the operator saved an estimated 14 percent of total rig time. Without accurate and reliable LWD data, particularly from the reservoir sections where circulating temperatures exceeded 347°F (175°C), it would have been very difficult to effectively plan the completion and production of these wells. A total of 526.46 hours was accumulated, with circulating temperatures in excess of 347°F (175°C) across the 24 wells drilled.

Sperry Drilling was the first to introduce M/LWD tools rated to 392°F (200°C) to the Gulf of Thailand in 2012, and also provided the world's first full M/LWD triple-combo suite rated to 392°F (200°C), with its first successful run in 2015. To support the growing demand for this type of service at deeper depths and, therefore, higher temperatures, Sperry Drilling is now maintaining a fleet a Quasar Trio tools in Thailand to support multiple drilling projects simultaneously.

 **SAVED
OPERATOR
14% of rig time**

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