

Juggernaut® Cutters and Cerebro® In-Bit Sensing Helps Reduce Drilling Time for Parex Resources Colombia

CUSTOMIZED DRILL BIT IMPROVES RATE OF PENETRATION AND REDUCES DRILLING DYSFUNCTION, WHILE SETTING A FIELD RECORD

COLOMBIA

CHALLENGE

- » Drill 17-1/2 in. section in mature field consisting of shale and sand with a history of complex lithology and vibration

SOLUTION

- » Employ DatCI process to design a custom drilling solution consisting of Juggernaut cutters and Cerebro in-bit sensing technology

RESULT

- » Reduced drilling time and vibration
- » Improved ROP
- » New field record achieved in section drilling 36% faster than previous wells in the area
- » Saved operator 7.7 hours of rig time

OVERVIEW

Using the design at the customer interface (DatCISM) process, Halliburton Drill Bits and Services' application design evaluation specialist designed a drilling solution for Parex Resources Colombia for a 17-1/2 in. section in the Arauca field, improving on the previous drilling record and saving the operator both time and costs.

Halliburton performed well in previous runs in the Arauca field using data gathered from Cerebro® in-bit sensors. A new Cerebro-equipped bit design, featuring Juggernaut® cutters, reduced bit dysfunction, which led to longer bit life and a record-setting run.



CHALLENGE

Previous wells drilled in the Arauca field required two or three bits to complete the 17-1/2 in. section, which featured complex lithology composed of sand and shale. In addition, drilling dysfunction and instability led to poor dull conditions which limited bit life and rate of penetration (ROP).

SOLUTION

Analysis of prior runs using Cerebro in-bit sensing data identified high levels of axial and lateral vibration in deeper portions of the section coupled to periods of weight-on-bit variation. The modified drill bit design consisted of a revised layout to improve bit stability and improve force balancing in critical areas. The design also incorporated upgraded Juggernaut cutters, an advanced cutter family specifically created to address the most challenging drilling environments.

Pre-run modeling projected the design to improve durability to drill the most difficult intervals with minimal impact to weight-on-bit requirements. Cerebro in-bit sensing was also included in this design to monitor performance and measure vibrations and dysfunction.

RESULT

Deploying this custom drilling solution, the operator reduced vibration and improved bit durability in the deep intervals of the section resulting in drilling time that was 36% faster than previous wells in the area, setting a field record. In addition, the operator saved 7.7 hours of rig time compared to offset wells.

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