UNCONVENTIONALS

CASE STUDY

WILLISTON BASIN OPERATOR DRILLS THROUGH UNCONVENTIONAL WELL CURVE IN 4.9 HOURS

HALLIBURTON'S CRUZER™ DEPTH-OF-CUT ROLLING ELEMENT IMPROVES BIT TOOL FACE CONTROL

NORTH DAKOTA, UNITED STATES

CHALLENGES

» Decrease the time required to drill the curve section of an unconventional horizontal well

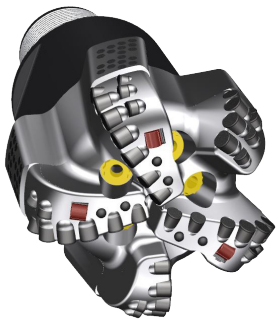
SOLUTION

» Cruzer™ Depth-of-Cut Rolling Element, used with Halliburton PDC drill bit, to optimize directional drilling by reducing reactive torque and improving efficiency

RESULTS

» Provided more stabilized control, with 29% decrease in torque fluctuation
» 15% improvement in ROP, taking only 4.9 on-bottom hours to drill the curve (at a build rate of 10 degrees per hundred feet)
» Drilled 750 feet at 152.4 feet / hour setting a new record ROP for a Williston Basin Curve section

OVERVIEW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Cruzer™ DOCC Rolling Element

In the beginning of 2017, Halliburton introduced to market its innovative Cruzer™ Depth-of-Cut Rolling Element. This drill bit technology is designed to increase tool face control—without reducing drilling efficiency. To date, the Cruzer has been used successfully for more than 20 unconventional drilling projects in the Williston Basin region of North Dakota. The new technology did not disappoint. In fact, one particular horizontal well in this area represents a "record-breaking" milestone run for the Cruzer, as it enabled the operator to drill the build section of a curve in just 4.9 on-bottom hours. This clearly demonstrated efficiency gains due to improved steering control of the bit tool face, increasing ROP by 15% (among other advantages described below).

TECHNOLOGY ADVANTAGES

The rolling element is particularly effective in applications that require more stabilized control of the directional drilling process. This feature, when used in conjunction with Halliburton's polycrystalline diamond compact (PDC) drill bits, addresses high abrasion and impact resistance in challenging formations, where depth-of-cut control is essential throughout the bit run. In this milestone case, the Cruzer was incorporated into an 8-¾" GeoTech™ GTD55DCU PDC drill bit.

The Cruzer provides the following advantages:

» Greater efficiency and reliability
» Consistent depth-of-cut control
» Increased tool face control
» Increased rate of penetration (ROP)
» Decreased torque fluctuations
» Reduced friction, heat, and vibration

"Halliburton Drill Bits and Services new **GTD55DCU** helped us reduce our drilling time and achieve a record curve run for North Dakota by improving tool face control. "

- Drilling Manager

Whiting Petroleum Corporation

CONCLUSION

Williston Basin was a great proving ground for this new technology, serving as a tough performance test in one of, if not the most, difficult directional drilling environments in the United States. We are already seeing the same technology applied to other parts of the world with impressive results.

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Shows condition of bit following operator's record run (4.9 hour curve)

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