

Case study: North Africa

Talon Strike PDC bit delivers fastest well vs offsets with zero vibration issues

A customer in North Africa had experienced numerous bottomhole assembly (BHA) twistoffs from vibrations while drilling the 16-in. sections. The repeated BHA damage was believed to be caused by high weight-on-bit (WOB) and RPM parameters (22 tons/180 RPM) generating high torque.

The customer's objective was to drill the surface section to total depth at ROP more than 20 m/hr (66 ft/hr), while maintaining good borehole quality and minimizing vibrations.

Using drilling data from the offsets, Baker Hughes Drill Bits application engineers put together a **Talon™ Strike PDC drill bit** design optimized for the durability and stability needed to drill the 16-in. section. They also optimized the bit design for smooth cuttings removal which led to reduced torque spikes.

WOB and RPM drilling parameters were optimized formation by formation, making it possible to both increase ROP

and preserve cutting structure. This also resulted in a higher quality, less tortuous, wellbore.

In the first well, the Talon Strike bit delivered the fastest well compared to offsets by drilling 28 m/hr (88.5 ft/hr) for 1515 m (4,970 ft) and reaching section total depth of 1770 m (4,970 ft) with zero BHA damage due to vibrations. This compared to 28 incidents from competitors' bits over a three-year period. In addition, the Baker Hughes bit delivered good borehole quality and eliminated the need for an additional short trip to control the borehole.

In a second well, the Talon Strike bit averaged 25.12 m/hr (82 ft/hr) while drilling 1859 m (6,099 ft) and reaching section TD of 2358 m (7,736 ft).

Consistent performance on these two runs delivered 100% TD rate, above average ROP despite using reduced parameters, and the two fastest wells with zero BHA damage.

Challenges

- Drill 16-in. section in one run with good ROP
- Ensure good borehole quality
- Improve ROP achieved by offset wells
- Eliminate severe vibrations causing BHA failures/twistoffs

Results

- Reached 1770 m section TD in one well, and 2358 m section TD in a second well
- Recorded best ROP of 28 m/hr compared to offset wells
- Sustained zero BHA twistoffs due to vibrations
- Delivered good hole quality, eliminating the need for additional short trips to backream and enabling smooth casing run

