TerrAdapt adaptive drill bit drilled 63% faster than previous best run

$580k
Saved on a single well

63%
ROP improvement over previous best run

86%
Faster than the competitive bit-reamer offset

The 12¼-in. tangent interval in the Green Canyon field in the Gulf of Mexico is notorious for drilling dysfunctions caused by interbedded shale and sand formations throughout the 4,500 ft (1372 m) section. In addition to the potential damage and nonproductive time (NPT) caused by stick-slip, operators in this field typically incur further inefficiencies due to sub-optimal bit-reamer matching through varying lithology as well as when they are forced to trip out of the hole to make a dedicated rathole reaming trip. To reduce NPT in this interval, Baker Hughes, a GE Company (BHGE), proposed a unique bottomhole assembly (BHA) solution, including a **TerrAdapt™ adaptive drill bit**, a **GaugePro™ ECHO digital reamer** for rathole elimination, and **GaugePro™ XPR** as the main reamer with the string powered by an **AutoTrak™ rotary steerable system** (RSS).

Total solution outcome

The combined solution drilled and reamed 4,652 ft (1418 m) in 40.5 drilling hours, with an average rate of penetration (ROP) of 114.7 ft/hr (35 m/hr). The 14 ½-in. ECHO reamer reamed 324 ft (99 m) of rathole on the fly, eliminating the need for an additional dedicated trip. The interval was completed 63% faster than the previous best run, and 86% faster than the competitive bit/reamer offset. The TerrAdapt drill bit and GaugePro ECHO reamer saved the operator more than $580,000 USD–$468,000 of which was related to the TerrAdapt technology–by drilling the section to total depth faster with no NPT. The remainder was saved by eliminating a dedicated trip to ream the rathole.

New industry standard

The **MultiSense™ dynamics mapping system** was deployed in the bit to measure downhole vibrations. The data showed no presence of stick-slip with 98% of the drilling levels registering as smooth drilling. Historically, challenges with drill bit and reamer matching have been problematic for drilling dysfunctions, so pairing an autonomous drill bit that can adjust its behavior downhole with a digital reamer is a significant step forward in the industry.

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