

Turbodrill and Hybrid Bit Save PEMEX 12 Days During 548-h Run, Remaining in Hole for 27 Days

Combining steerable turbodrill with hybrid drill bit delivers high-quality wellbore while eliminating a cleanout run

CHALLENGE

Minimize time and BHA trips required to drill 12¼-in hole section of Mexico land well in interbedded formations of 10,000 to 30,000 psi.

SOLUTION

Combine Neyrfor Traditional* standard turbodrill and a Kinetic* hybrid diamond-impregnated bit with PDC cutters.

RESULT

- Drilled the 1,455-m hole section at average ROP of 1.7 m/h.
- Saved 12 days of drilling time during a 548-hour run, remaining in hole for 27 days.
- Provided quality wellbore that enabled successful running of 9⅝-in casing.
- Delivered a high-quality borehole, eliminating the need for a cleanout run before running casing.



Minimize drilling time for Mexico land well

PEMEX was constructing 12¼-in hole sections of land wells in interbedded formations of 10,000 to 30,000 psi in Mexico's Mesozoic Chiapas-Tabasco oil province. The operation required drilling the 13⅜-in casing shoe track at approximately 3,800-m MD, kicking off from vertical, building inclination to 18°, and holding the tangent to section TD at more than 5,200-m MD. PEMEX typically spent 66 days and made six BHA trips for bit changes for this type of operation and wanted to reduce both drilling time and the number of BHA trips.

Combine turbodrill with hybrid bit

Schlumberger combined a 9½-in steerable Neyrfor Traditional turbodrill with a 12¼-in Kinetic hybrid diamond-impregnated bit from Smith Bits, a Schlumberger company. The turbodrill provided the precise toolface control needed to drill the planned trajectory, and the diamond-impregnated bit provided effective cutting action for drilling out the shoe track and maintaining a high ROP in a mix of lithologies that included mudstone, marl, shale, wackestone, and an anticipated 30% chert.

Using the turbodrill, drill bit, and 14.6-lbm/galUS oil-base mud, inclination was built from vertical to 18.2° in just 136 m, and the 12¼-in hole section was drilled to planned TD at 5,255-m MD in just four runs totaling 1,455 m. Circulating time totaled 1,073 h, of which 861.75 h was on-bottom drilling time. ROP averaged 1.7 m/h and could have been higher if rig capability had not limited the flow rate to 518 galUS/min and standpipe pressure to 4,100 psi.

SlimPulse*
retrievable MWD service

mcrVISION* low-risk
propagation resistivity-
while-drilling service

8¼-in by 12⅞-in stabilizer

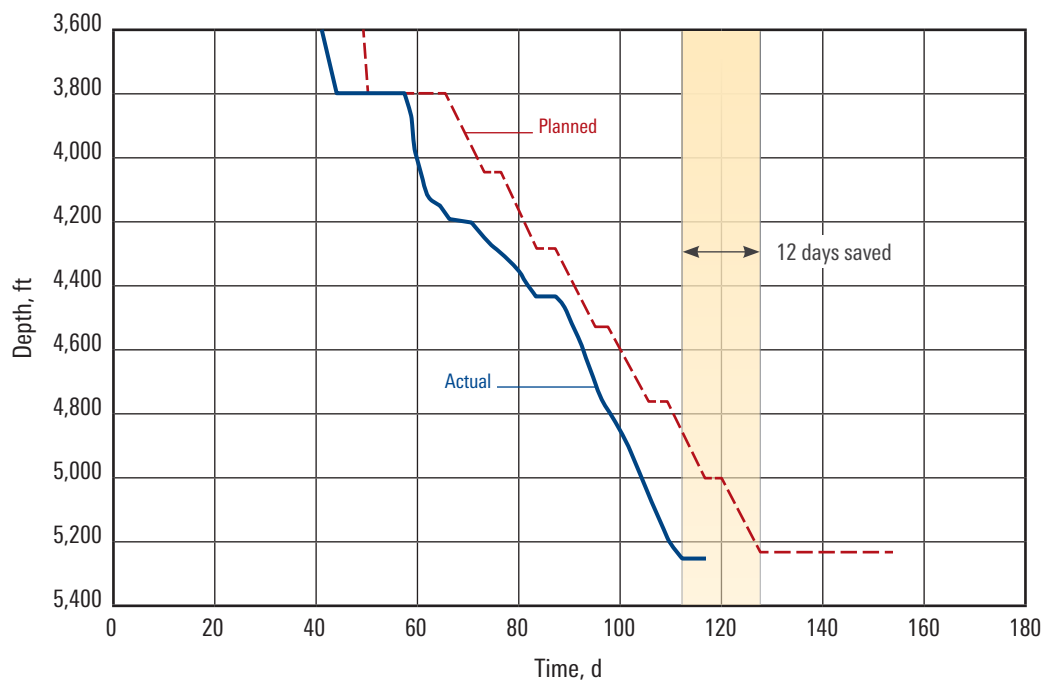
Neyrfor Traditional turbodrill

12¼-in hybrid Kinetic drill bit



The BHA reduced the number of runs needed to drill the 12¼-in hole section.

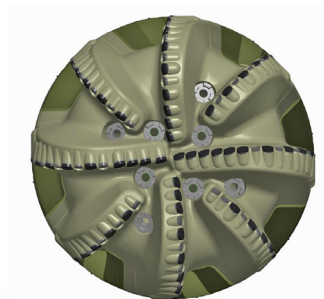
CASE STUDY: Steerable turbodrill and hybrid bit increase ROP and save 12 days during 548-h run



The Neyfor Traditional turbodrill and Kinetic hybrid bit drilled the 12¼-in hole section in 12 days less time than planned.

Saved 12 days of drilling time

Drilling the 12¼-in hole section took 54 days—12 days less than planned—during a 548-h run in which the BHA remained in hole for 27 days. The operation provided a quality wellbore that enabled successfully running the 9⅝-in casing without the need for a cleanout run. Based on this performance, PEMEX plans to use Neyfor* turbodrilling systems in future projects.



The Kinetic hybrid diamond-impregnated bit is designed to drill effectively in a mix of lithologies without extra trips to change the bit.

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