

Turbodrilling Deviated Interval Saves PEMEX 96 Hours

Steerable turbodrill and 8½-in diamond-impregnated bits reduce number of runs while drilling abrasive formation onshore Mexico

CHALLENGE

Reduce number of days, runs, and bits required to drill 8½-in interval in Cretaceous formation with high percentage of abrasive chert nodules.

SOLUTION

Use 6½-in Nyrfor* turbodrilling system with 8½-in Kinetic* diamond-impregnated bits.

RESULTS

- Drilled to TD in less than 211 hours at an average ROP of nearly 7 ft/h.
- Saved 96 hours bringing well to production.



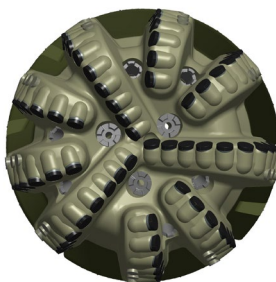
Drill through abrasive Cretaceous formation

PEMEX was drilling the 8½-in intervals of onshore wells in the Terra field near Villahermosa, Mexico, with positive displacement motors (PDMs) and rock and PDC bits. Because the Cretaceous formation—which was mainly compressible mudstone with up to 40% abrasive chert nodules—caused rapid wear of BHA components, multiple runs and many days were required to drill each interval. PEMEX wanted to reduce drilling time for the interval and the number of bits used.

Introduce turbodrilling system with diamond-impregnated bits in Mexico

The Schlumberger Integrated Project Management (IPM) team, working with PEMEX, introduced the 6½-in Nyrfor turbodrilling system with 8½-in Kinetic diamond-impregnated bits from Smith Bits, a Schlumberger company, in Mexico to replace the PDM system and rock bits. The directional turbodrill was configured with two integral body stabilizers, which were augmented with a string stabilizer.

8½-in KHi913 bit



8½-in K503 bit

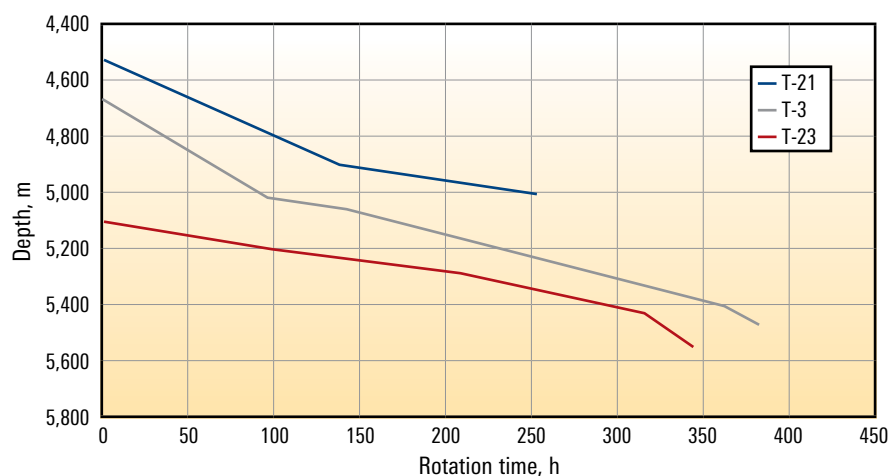


The ability of the Kinetic diamond-impregnated bits to withstand rigorous drilling conditions reduced the number of bits needed to drill the interval.



The Nyrfor turbodrilling system achieved an average ROP of nearly 7 ft/h.

CASE STUDY: Steerable turbodrill and 8½-in PDC bits save 96 hours onshore Mexico



The Neyrfor turbodrilling system and Kinetic bits drilled the 8½-in interval of Well T-21 in much less time than conventional systems with rock and PDC bits that were used to drill the 8½-in intervals of offset Terra field wells T-3 and T-23.

During the first turbodrill run, the directional plan called for building angle, and the a KHi913 hybrid Kinetic bit with PDC cutters were used. Later, the turbodrill was run with a K503QTB Kinetic bit designed for superior performance at high rotary speeds in tough, abrasive formations.

Saved 96 hours of drilling time

Using the Neyrfor turbodrill and customized Kinetic bits, the directional driller successfully built angle to 28° and reached interval TD in less than 211 hours at an average ROP of nearly 7 ft/h. The time to drill to TD was approximately 96 hours less than the time required to drill the interval in offset wells with conventional drilling systems. Reducing the drilling time enabled PEMEX to put the well into production sooner.

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