

PEMEX Saves 3 Rig Days with First Neyrfor Turbodrill and Kinetic Bit Run, Offshore Mexico

Turbodrilling system increases ROP 104% drilling 30° deviated interval through hard formation

CHALLENGE

Improve ROP and bit durability while drilling an 8½-in section through a hard limestone formation with traces of chert in the Gulf of Mexico.

SOLUTION

Run a 4¾-in T1 XL MK2 FBS Neyrfor Traditional* standard turbodrill with an 8½-in K503QBTPXC Kinetic* diamond-impregnated bit.

RESULT

Saved over 72 h of rig time with 104% increase in ROP, compared with a tungsten carbide insert (TCI) bit and packed assembly that was used to drill an offset well across the same interval.



Hard formation challenges drilling performance in Gulf of Mexico

PEMEX needed to improve ROP and bit durability while drilling an 8½-in, 30° deviated interval through a Mid-Cretaceous hard limestone formation with traces of chert in the Gulf of Mexico. Unconfined compressive strength (UCS) in this area ranges from 18,000 to 25,000 psi. A conventional TCI bit and packed assembly had been tried in an offset well across the same interval with disappointing results: ROP of only 1.03 m/h.

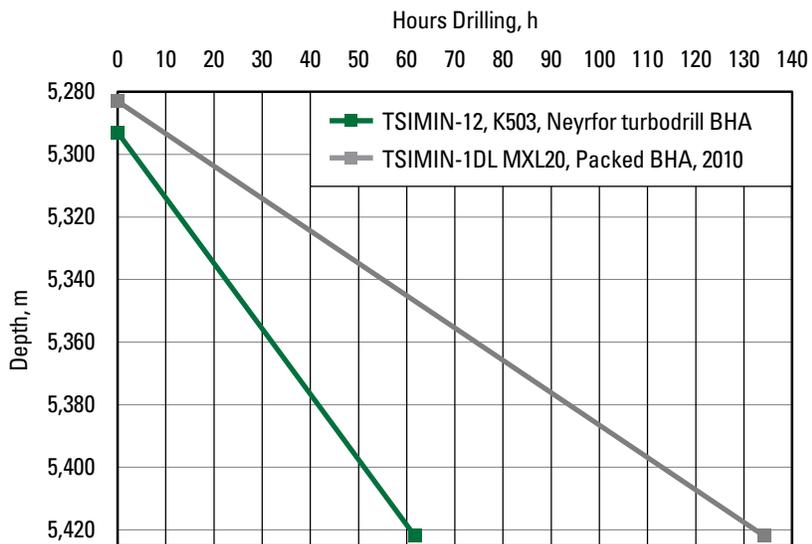
Neyrfor Traditional turbodrill and Kinetic bit offer efficiency and directional control

To select the best turbine for PEMEX’s application, Smith Services conducted hydraulic analysis to verify that the tool could generate adequate power output without affecting the maximum pressure limits of the platform mud pumps. They selected the 4¾-in T1 XL MK2 FBS Neyrfor Traditional turbodrill. In addition, a BHA was designed that stabilized the turbine to allow rotating ahead with a hold tendency, while enabling the operator to make the necessary directional corrections to drill the section with maximum efficiency while maintaining a 30° inclination.

Based on the formation lithology for this application, Smith Bits used DBOS* drillbit optimization system to determine the best bit: 8½-in K503QBTPXC Kinetic bit with a round profile, 15 blades reinforced with grit hot-pressed inserts (GHI), and 116 SPC diamonds was selected. Designed for hard, abrasive formations, this bit type is also effective with mixed lithologies.

104% increase in ROP saves over 3 rig days

Compared to the packed assembly and TCI bit that were used to drill an offset well across the same interval and depth, the Neyrfor Traditional turbodrill and Kinetic bit drilled a 130 m, 8½-in section through the hard limestone formation while maintaining the required 30° inclination, with an average ROP of 2.09 m/h, which increased drilling performance by 104% and saved PEMEX 3 rig days.



Hours vs. depth comparison with offset well drilled with packed BHA, 2010.

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