

# PEMEX Saves 5.6 Days and USD 300,000 While Drilling 78° Curve in 12¼-in Section

PowerDrive Orbit RSS achieves smooth 3D well trajectory and improves ROP

## CHALLENGE

Efficiently drill 12¼-in curve section of a horizontal well in field with historically high shock and vibration that requires heavy mud weight.

## SOLUTION

- Drill curve and maintain reliability in heavy mud weight environment with PowerDrive Orbit\* rotary steerable system (RSS).
- Pair RSS with a SHARC\* high-abrasion-resistance PDC bit from Smith Bits, a Schlumberger company, to control shock and vibration, as modeled by IDEAS\* integrated drillbit design platform.

## RESULTS

- Precisely steered curve with an average dogleg severity of 3.6°/30 m [3.6°/100 ft] in large hole section.
- Successfully drilled section to TD in heavy mud weight conditions.
- Saved 5.6 days of drilling time, reducing operating costs by USD 300,000.



## Drill challenging curve in large hole section

PEMEX was developing a horizontal well in a field near Villahermosa, Mexico, and needed to drill a curve in the 12¼-in section. The drilling plan called for a curve with a 78° inclination and 28°—22° azimuth to allow the well to be landed in the Paleocene reservoir. Adding to the challenge of developing this well, the field is characterized by high shock and vibration and a narrow mud weight window. Wells drilled in this field require heavy mud weight (greater than 14 ppg) to remain within the reservoir’s mud weight window. Maintaining this window is critical to avoiding gains or losses that result in NPT.

To achieve its objectives, PEMEX needed an RSS capable of building 5°/30 m [5°/100 ft] to assure it could achieve the planned 3.6°/30 m [3.6°/100 ft] build. It would also need to be able to operate reliably in heavy mud weight conditions, which typically present reliability and durability issues for conventional RSSs.

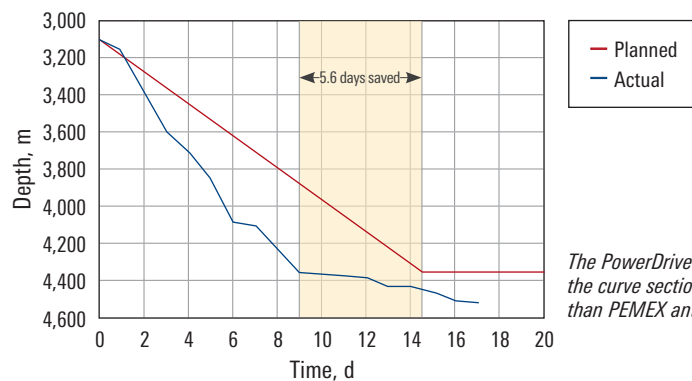
## Use PowerDrive Orbit RSS to drill curve and withstand heavy mud weight

Schlumberger experts recommended the PowerDrive Orbit RSS, which has a pad actuation with metal-to-metal seals that withstand solids in the mud. Using the IDEAS platform to model bit-rock interaction specific to the field, Schlumberger determined that the SHARC bit would effectively manage shock and vibration in combination with the highly reliable push-the-bit RSS.

## Achieved shoe-to-shoe drilling of curve section

The PowerDrive Orbit RSS smoothly drilled the 12¼-in section from shoe to shoe with an average dogleg severity of 3.6°/100 ft [3.6°/30 m], allowing the well to be landed on target. The RSS and SHARC bit reached section TD 5.6 days ahead of schedule by withstanding heavy mud weight conditions and effectively managing shock and vibration. This time savings reduced operating costs by USD 300,000.

PEMEX plans to use these technologies to more efficiently develop future horizontal wells, which are the trajectory type with the highest recovery rate in the field. For this field, a typical horizontal well produces about 4,000 bbl/d with gas lift—1,500 bbl/d more than other types of directional wells typically produce there.



The PowerDrive Orbit RSS drilled the curve section 5.6 days faster than PEMEX anticipated.

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