

# Australian Operator Drills 2,400-m Vertical Well with Inclination of 0.75° in Faulted Formation

PowerV RSS enables crucial well evaluation program while saving 2 rig days

## CHALLENGE

Maintain verticality in a faulted formation with high dip angle.

## SOLUTION

Hold inclination while increasing drilling performance using the PowerV\* vertical drilling rotary steerable system (RSS) paired with a SHARC\* high-abrasion-resistance PDC drill bit from Smith Bits, a Schlumberger company.

## RESULTS

- Drilled 12¼-in section to 2,400-m MD with maximum inclination of 0.75°.
- Drilled 8½-in section to 4,400-m TD with maximum inclination of 0.26°.
- Achieved ROP of 58.2 m/h.
- Maintained verticality to support wireline logging and coring.
- Saved 2 days of drilling as compared with an offset well.



## Drill vertical well in faulted shale formation

As part of a gas exploration program in South Australia, an operator was drilling vertical wells in a faulted formation with a high dip angle. Maintaining verticality of the wellbores was critical for conducting extensive coring, wireline logging, and downhole testing. Natural walk and faults in the formation had prevented the operator from achieving verticality in offset wells using positive displacement mud motors and traditional rotary BHAs.

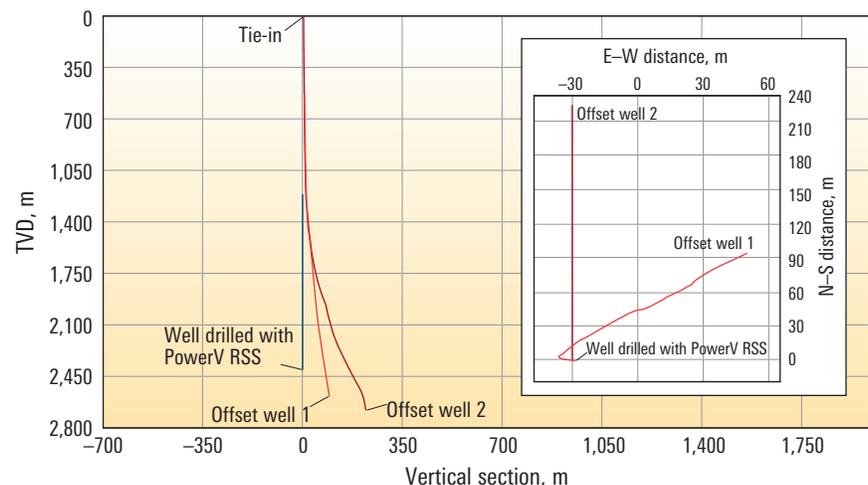
The first offset well was drilled to 2,585-m MD using a BHA with a mud motor, and the well deviated to an inclination of 10° and departed 94.3 m from the surface location at 2,585-m MD. The second offset well, which was drilled using a rotary steerable BHA, deviated as much as 20° and departed 225 m from the surface location at 2,680-m MD.

## Hold inclination with vertical drilling RSS

Schlumberger recommended using the PowerV RSS optimized with a SHARC high-abrasion-resistance PDC drill bit to drill the 12¼-in section from 500-m MD to 2,400-m MD. The RSS was fitted with an another SHARC drill bit to drill the 8½-in section from 2,400 m to TD at 4,400 m. Using automatic inclination hold mode, the PowerV RSS maintains precise directional control. The fully rotating design of the RSS also decreases the risk of differential sticking and improves hole cleaning.

## Maintain verticality to support wireline and coring operations

Using the PowerV RSS, the operator was able to maintain verticality with a maximum of 0.75° inclination despite high dip faults in the critical 12¼-in section; a maximum of 0.26° was achieved in the 8½-in section. The PowerV RSS paired with a SHARC drill bit drilled 1,863.5 m at 58.2 m/h, reaching section TD 2 days faster than was achieved in an offset well drilled with a mud motor BHA. The wellbore also met the tight tolerances required by the operator, which allowed for the successful conclusion of the extensive well evaluation program.



Offset wells 1 and 2 were drilled with mud motor and rotary steerable BHAs, and their wellbores deviated 10–20°. The PowerV RSS maintained verticality in the deep shale reservoir with a deviation of 0.75° or less while maintaining higher ROP than was achieved in either offset well.