Devon Energy in Brazil
Saves over US$ One Million with Matched Drilling Solution
Location: Polvo Field, Offshore Brazil

**OPERATOR’S CHALLENGE** – Devon Energy sought to decrease operational time while drilling an extended reach directional well from an offshore platform in the Polvo Field.

**HALLIBURTON’S SOLUTION** – Sperry Drilling services responded by planning to reduce trips for bottomhole assemblies (BHA) and by increasing rate of penetration (ROP). The Geo-Pilot® XL 7600 series rotary steerable system matched with an 8 ½-inch FMF3565Z Geo-Pilot bit from Halliburton Drill Bits and Services was deployed, as well as pressure-while-drilling (PWD) and downhole vibration sensors. Sperry’s ADT® applied drilling technology drilling optimization service was used to continuously monitor drilling parameters and damaging vibration.

**ECONOMIC VALUE CREATED** – Devon Energy saved three days of rig time, estimated at US$ 1,050,000.

**PLANNING THE EXTENDED REACH WELL** – With numerous improvements to drilling practices and tool selection made by Devon Energy and Sperry Drilling over the past two years, tool reliability had increased in this offshore directional application. This well plan called for drilling at a tangent angle of 72 degrees to a maximum vertical section distance of approximately 5,800 meters (19,029 feet), which made hole cleaning a challenge and required care to ensure the wellbore was in optimal condition for tripping out.

Higher instantaneous ROP resulted from the use of high-flow tools (which helped increase BHA life) combined with the Geo-Span® downlink system. Improving the survey time also led to faster connection times, and consequently much better average ROP.

The Geo-Pilot system was run with a matched extended-gauge bit design to help eliminate hole spiraling and minimize wellbore tortuosity while maximizing ROP and directional control. Due to the extended reach of the well, it was also critical that equivalent circulating density (ECD) was accurately monitored, so a PWD sensor was run, along with downhole vibration sensors to monitor vibration conditions for optimum tool life.
The Geo-Pilot system provided excellent directional control and high string rotation (120-180 rpms) for optimizing hole cleaning and ROP.

Halliburton's matched drilling solution delivered a record 4,080 meters (13,386 feet) in a single run, far surpassing the previous registered record length of 2,471 meters (8,107 feet), on the way to the target depth of 5,564 meters (18,255 feet). A new record for most meterage for 24 hours was also set, drilling 1,610 meters (5,282 feet) during that time.

In addition, the run achieved a penetration rate of 96.9 m/hr (318 ft/hr) – more than four times faster than the next-best offset ROP of 23.10m/hr (76 ft/hr). At the record ROP of 1,610 meters in 24 hours, the faster drilling resulted in better hole condition in general, and therefore less time lost on trips, as well as better gauge hole and significant reduction in mud consumption.

Devon Energy saved three days of rig time as a result of this record-setting performance, amounting to a total savings of US$1,050,000.

What’s more, the capability to rapidly and accurately drill very extended reach wells from the platform has made a much larger area available to be drilled, and may avoid the need for Devon to bring in an expensive semi-submersible rig to drill and complete this type of well and reduce CAPEX by also avoiding expensive pipeline and manifold installations.

DRILLING OPTIMIZATION – Working closely with Devon personnel, Sperry's ADT optimization service specialists monitored drilling parameters and vibrations to help deliver maximum ROP while also helping to ensure damaging high vibrations were avoided. In addition, a Sperry task force, located both in the office and on the rig, worked to identify ways to make connections faster, resulting in connection times that were a great performance improvement on the platform.