Repsol Uses HyperBlade Bit and PowerDrive Orbit RSS to Set ROP Record in Appalachian Basin

Schlumberger integrated technologies improve drilling performance in Pennsylvania well

**CHALLENGE**
- Improve ROP in the lateral section of a well through shale formation without affecting durability.

**SOLUTION**
- Deploy the HyperBlade* hyperbolic diamond element bit with a PowerDrive Orbit* RSS to increase drilling efficiency.

**RESULTS**
- Drilled the entire section with 38% faster ROP.
- Set new basin record for the operator.

Improve drilling performance through soft shale formation
Repsol Oil and Gas USA, LLC sought to improve ROP in the 8½-in lateral section of wells in the Marcellus shale. The section is between 7,000 ft and 9,000 ft with a lithology comprising primarily of shale with unconfined compressive strength of 3,000 to 5,000 psi. The formation is soft with very low abrasion and impact properties. Repsol wanted to drill the section in a single run with faster ROP than their baseline bit without lowering durability.

Combine bit incorporating unique-geometry cutting element with RSS
To achieve Repsol’s objective, Schlumberger recommended fitting the BHA with a HyperBlade bit and a PowerDrive Orbit RSS. The distinctive shape of the Hyper* hyperbolic diamond cutting elements significantly improves cutting efficiency in plastic formations and delivers higher instantaneous ROP. It also has a thicker diamond table for increased durability. Using the IDEAS* integrated dynamic design and analysis platform, a new 5-blade HyperBlade bit was designed specifically for this application.

The PowerDrive Orbit RSS is highly versatile, tough, and reliable in any operational environment. In addition to enhanced durability, the PowerDrive Orbit RSS provides enhanced trajectory control for smoother boreholes.

The HyperBlade bit achieved higher instantaneous ROP with the same WOB and rpm, as compared with offset wells using PDC bits with conventional cutters.
Achieved an overall average ROP of 38% over three wells while reducing drilling time

Repsol used the BHA with the new HyperBlade bit and PowerDrive Orbit RSS to drill the 8½-in section for three wells on the same pad. On Well 5, the BHA drilled 6,891 ft in 16.6 drilling hours. An average on-bottom ROP of 415.1 ft/h set a new ROP record for Repsol and achieved an impressive 62% improvement over the two offset runs with a conventional PDC bit. Overall, three wells drilled with HyperBlade bits showed a 38% ROP improvement over the 2 offset wells drilled with conventional PDC bits.

The HyperBlade bit outperformed offset PDC bits on the same pad.