Schlumberger

Integrated Drilling System Sets Back-to-Back Single-Run Records for Encana, Horn River Basin

Hard rubber PowerPak HR motor and SHARC drill bit increase ROP and reduce trips in western Canada unconventional gas play

CHALLENGE

Extend run life and reduce number of trips to reach TD in hot gas wells.

SOLUTION

- Design a drilling system using PowerPak HR* hard rubber motor lined with Dyna-Drill NBR-HR elastomer to power a SHARC* high-abrasion-resistance PDC drill bit from Smith Bits, a Schlumberger company.
- Use the TeleScope* high-speed telemetry-while-drilling service, directional drilling service, and the Slider* automated surface rotation control system to improve sliding intervals.

RESULTS

- Set back-to-back records with run lengths of 4,650 m [15,256 ft] and 5,258 m [17,250 ft], which were also worldwide records for 8¾-in bits.
- Set a North American record for the longest single run length (5,258 m) for any bit size.
- Reduced the number of trips.

Extend run life and reduce trips in unconventional gas play

Schlumberger was working with Encana to drill directional wells from pads in an unconventional gas play in the Horn River basin of British Columbia, Canada. Temperatures that sometimes exceeded 150 degC [302 degF] limited the run life of the downhole equipment. To extend run life and reduce the number of trips needed to reach TD, Encana and Schlumberger jointly designed a drilling system engineered to deliver maximum performance.

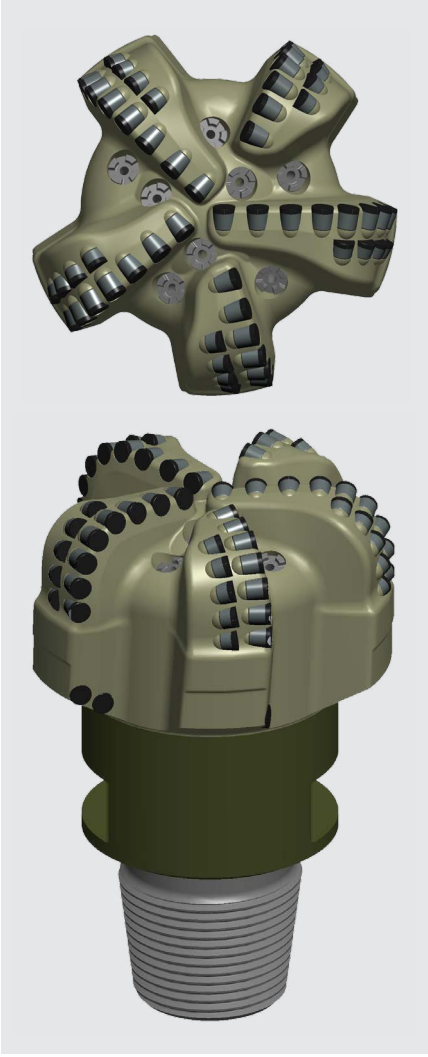
Design a fit-for-purpose integrated drilling system to reduce trips

The BHA included a 7-in-OD PowerPak HR hard rubber motor lined with Dyna-Drill NBR-HR elastomer that powered a SHARC drill bit, the TeleScope service, directional drilling services, and the Slider system.

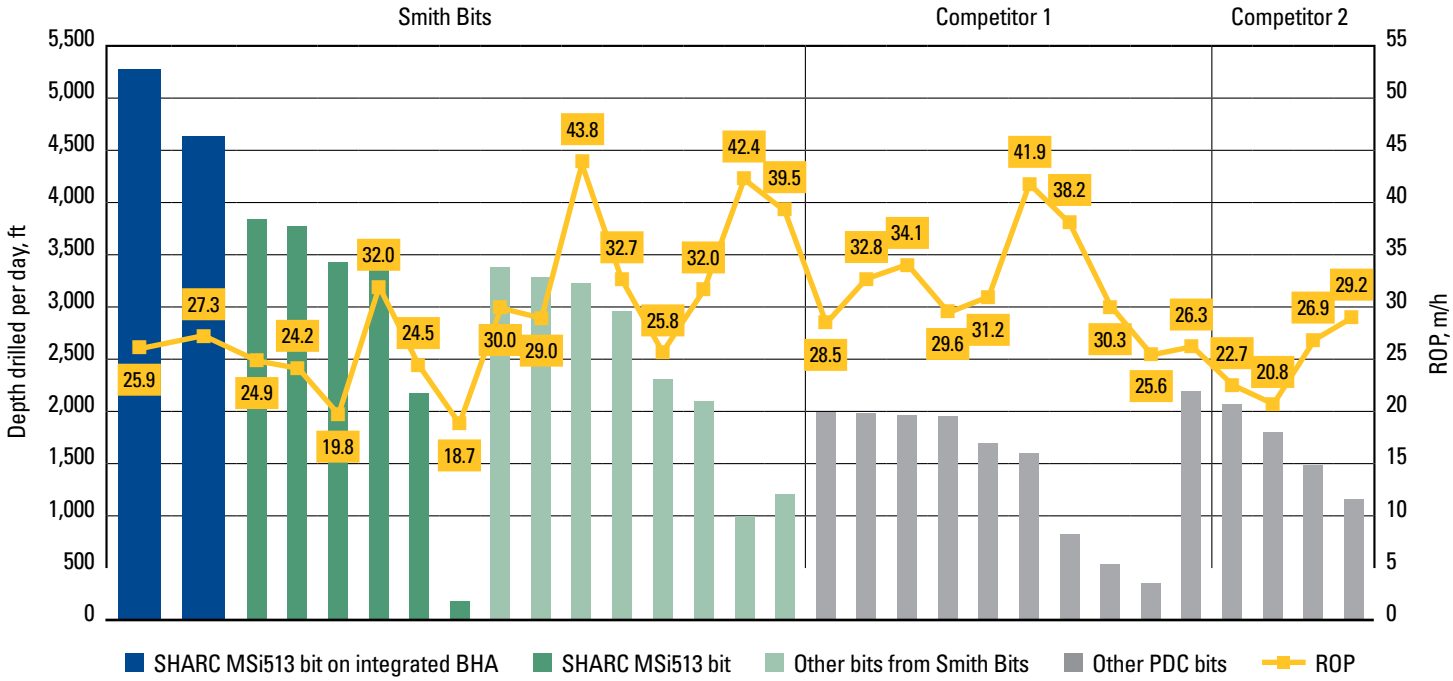
The PowerPak HR motor drilled 4,650 m of the 8¾-in hole in the first well and 5,258 m on the second well in one run. The BHA with the SHARC PDC bit and PowerPak HR motor began drilling at 754-m MD, drilled the build section to land the well, and continued drilling in the lateral section.

After staying in the hole for 255 circulating hours and spending 170 hours drilling at an average ROP of 27.3 m/h, the BHA was pulled out of the hole for a pipe swap.

In a subsequent well, a PowerPak HR motor and SHARC bit drilled 5,258 m of the 8¾-in hole at an average ROP of 25.9 m/h, setting another worldwide run length record for 8¾-in hole size and a North America record for all hole sizes. The run totaled 203 drilling hours and 303 circulating hours at temperatures exceeding 150 degC.



A MSi513 SHARC high-abrasion-resistant PDC bit was used in the integrated BHA to extend drilling runs and reduce the number of trips.



When compared with offset drilling performances using conventional PDC bits (gray) and SHARC MSi518 bits run on conventional BHAs (green), the number of feet drilled per day increased significantly using the SHARC bit run on the specially engineered drilling system (blue) that combined a suite of Schlumberger technologies and services.

Set back-to-back drilling records

The Schlumberger drilling system set back-to-back records for the longest single 8¾-in run. Drilling 4,650 m in one run in the first well set a world record, which was surpassed by drilling 5,258 m in the second well in one run at downhole temperatures exceeding 150 degC. This run length is also a record for single-run distance for any hole size in North America.

The motor-elastomer configuration increased individual run length and reduced the number of trips, saving time and money for Encana. The performance improvement was the result of a team-based collaborative effort between Encana and Schlumberger teams at all levels to continue to redefine the technical limits and drill Horn River basin hot wells more efficiently, from spud to TD.

slb.com/drilling

Schlumberger