

BP Saves 48 Hours of Rig Time in Complex Underreaming Operation, Offshore Azerbaijan

Successful combination of Rhino XS reamer and WELL COMMANDER valve achieves customer goals and sets precedent for future wells

CHALLENGE

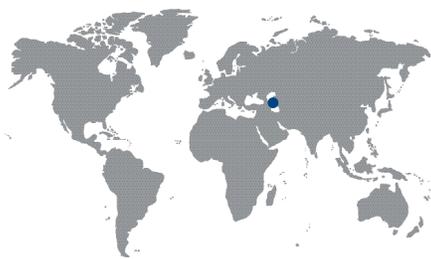
Underream 6½-in rathole to 8 in with a separate cleanout BHA, which would also be used for effective high-flow-rate hole cleaning and mud conditioning prior to a completion run.

SOLUTION

Drill and underream 6½-in × 8-in hole section with directional tools below Rhino XS* hydraulically expandable reamer, then underream 6½-in rathole to 8 in with a separate cleanout BHA; use 5-in WELL COMMANDER* ball-activated drilling circulating valve above reamer to bypass flow to annulus and keep cutter arms collapsed.

RESULTS

Saved 2 days of rig time on an offshore platform; achieved operator's goals and set the benchmark for future underreaming operations for at least two other BP offshore platforms.



Achieve effective hole cleaning at high flow rates

In the Chirag field offshore Azerbaijan, BP's underreaming operation called for a 6½-in rathole to be expanded to 8 in, with a separate cleanout BHA to be used for effective hole cleaning at a high flow rate and with mud conditioning prior to a completion run. Because circulation would continue with a Rhino XS reamer inside the casing, a solution was needed to keep the reamer arms closed. However, the 6375 series Rhino XS reamer does not have a deactivation option; once the arms are activated, they will open each time the pumps are on, which would damage the casing ID while circulating and hole cleaning with the reamer inside the casing.

Perform underreaming and cleanout in one trip

To overcome the reaming and cleanout challenges, Schlumberger recommended drilling and underreaming the 6½-in × 8-in hole section with directional tools below a 6375 series Rhino XS reamer, then underreaming a 6½-in rathole to 8 in with a separate cleanout BHA.

Because the 6375 series Rhino XS reamer cannot be deactivated, Schlumberger suggested using a 5-in WELL COMMANDER valve from M-I SWACO, a Schlumberger company, directly above the reamer to bypass flow to the annulus above, effectively keeping the cutter arms collapsed. Such a configuration would enable circulating at a much higher flow rate than with the reamer alone. A separate 7-in WELL COMMANDER valve was also placed higher up in the string (1,185 m from the bit) and was intended for circulating during hole cleaning above the 7½-in liner top inside the 9½-in casing. This would enable cleaning of the liner top and conditioning of the mud without tripping the 5-in WELL COMMANDER valve up to perform the same operation and then run back to TD as per the completion program.

Saved 2 days of rig time offshore and set operational standard

The complex mud conditioning and wellbore cleanout operation was successfully completed with 21 hours of circulation at a maximum rate of 700 galUS/min with 5-in and 7-in WELL COMMANDER valves above the Rhino XS reamer. The reamer's arms were confirmed closed inside casing prior to starting high-rate circulation and mud conditioning.

This combination saved BP 48 hours of rig time on an offshore platform and achieved the customer goals while also setting a precedent for future wells. The configuration was accepted as a standard BHA for the 6½-in × 8-in hole section on at least two other BP platforms.



The successful combination of the Rhino XS reamer and WELL COMMANDER valve achieved customer goals and set the standard for future BP wells in the region.

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