M-I SWACO
A Schlumberger Company

SWITCHBACK SCRAPER Tool and MAGNOSTAR Magnets Save 30 Hours and USD 525,000, North Sea

Specialized tool combination eliminates a dedicated cleanout run and ensures successful setting of middle completion packer offshore Norway

CHALLENGE

Optimize installation of middle completion packer in a North Sea well offshore Norway.

SOLUTION

Use the SWITCHBACK SCRAPER* versatile casing cleaning tool and three MAGNOSTAR* high-capacity magnets in the shoe track to eliminate a dedicated run and prepare the casing for the middle completion packer.

RESULTS

Drilled the shoe track and new formation and prepared the casing in a single run, saving an additional trip in the hole and approximately 30 h of rig time valued at USD 525,000.

More efficient procedure sought for installing a middle completion

An operator wanted to optimize its middle completion installation process in a North Sea well. Historically, the operator drilled out the shoe track, cleaned the rathole, and drilled new formation. Following the drilling process, a formation integrity test (FIT) and leakoff test (LOT) were performed to establish leakoff pressure. After completing these tests, the SWITCHBACK SCRAPER was activated and packer setting area scraped to prepare the casing prior to running the middle completion.

SWITCHBACK SCRAPER tool and MAGNOSTAR magnet combination streamlines operations

M-I SWACO recommended using its SWITCHBACK SCRAPER versatile casing cleaning tool in combination with three MAGNOSTAR high-capacity magnets to optimize operational efficiency.

The SWITCHBACK SCRAPER tool runs in the hole with its blades in the recessed position. When drilling operations are complete, a ball is dropped to contact the scraper tool. When the ball impacts the tool's seat, pressure is applied to the recommended level to activate the tool, and the pads extend outward and contact the casing wall. The activated tool then rotates through the area being prepared while fluid is circulated to remove dislodged debris.

SWITCHBACK SCRAPER tool scraper blades in the recessed position.

Three MAGNOSTAR magnets were run in the string to capture and recover the debris generated by the SWITCHBACK SCRAPER tool. Ideal for large-volume cleanup, each MAGNOSTAR magnet can retrieve up to 200 lbm [91 kg] of ferrous debris.

New tool combination saves a dedicated run and 30 hours of rig time

The operator drilled out the shoe track with 11,000-lbf [48,930-N] WOB rotating at 60 rpm. The operator cleaned the rathole in 6.5-ft [2-m] intervals while washing back into the casing shoe between each interval. A new 16.4-ft [5-m] formation interval was then drilled using 18,000-lbf [80,068-N] WOB and 64-rpm rotation.

After completing the drilling, the BHA was pulled back into the casing shoe, and the FIT and LOT were performed. Then, the SWITCHBACK SCRAPER tool was activated via ball drop at a pump rate of 122 galUS/min [460 L/min] at 362 psi [2.5 MPa]. The ball landed in the tool at 15,059-ft [4,590-m] MD, and pressure was increased in 493-psi [3.4-MPa] increments until the tool was activated at 1,624 psi [11.2 MPa]. The middle completion packer area of the well was then scraped using the SWITCHBACK SCRAPER tool. Following this operation, the tool was pulled out of hole.

At surface, the SWITCHBACK SCRAPER tool and MAGNOSTAR magnets were inspected and found to be in excellent condition. The lower MAGNOSTAR magnet recovered 41.9 lbm [19 kg] of debris, including a 4.7-in × 0.4-in [12-cm × 1-cm] slice of debris. The other two MAGNOSTAR magnets recovered a combined total of 13.2 lbm [6 kg] of debris.

Combining the SWITCHBACK SCRAPER tool with three MAGNOSTAR magnets helped the operator ensure successful middle completion setting. These M-I SWACO tools enabled drilling the shoe track and new formation, performing the FIT and LOT, and preparing the casing in a single run compared with the multiple runs previously required. This procedure also saved the operator an additional trip into the hole and approximately 30 hours of rig time valued at USD 525,000.

A large piece of ferrous debris recovered by the SWITCHBACK SCRAPER tool and MAGNOSTAR magnets.

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