

Nexen Uses MAGNOGARD and MAGNOSTAR Magnets in North Sea Field, Recovers 44 kg of Debris

Recovery facilitated the successful running and setting of liner hanger, offshore UK

CHALLENGE

Recover junk and debris after a bit and a conventional MWD tool were damaged downhole in the Golden Eagle field in the UK sector of the North Sea.

SOLUTION

Incorporate a MAGNOGARD* openhole magnet and two MAGNOSTAR* high-capacity magnets in the BHA.

RESULTS

Recovered 44 kg of debris—11 kg [24.25 lbm] using MAGNOGARD magnet, 15 kg [33 lbm] from upper MAGNOSTAR magnet, and 18 kg [39.5 lbm] from lower MAGNOSTAR magnet.

“When the magnets were pulled to surface, they were completely covered in debris. There is no question that this mixture of debris would have caused further problems if it had not been removed from the completion fluid.”

Iain Sutherland
Senior Drilling Engineer
Nexen



Recovering debris that could cause complications

Nexen was concerned that downhole debris would cause complications when running the screens and setting the liner in a well in the Golden Eagle field. The debris was the result of two separate runs. While drilling the 8½-in reservoir section, penetration was lost, and no progress was being made. Pulling out of hole revealed severe damage to the bit due to a lost bit cone, cutter, and matrix. Running back in with a second bit allowed Nexen to reach TD; however, during the run, a piece of debris from a conventional MWD tool was lost in the hole.

Incorporating magnets in the wiper trip BHA

M-I SWACO suggested incorporating the MAGNOGARD openhole magnet in the wiper trip BHA. The slick outside diameter (OD) enables rotation and reciprocation in the open hole with no fear of damaging the formation. Its powerful magnets and generous debris collection valleys make it ideal for capturing and retaining ferrous debris from the flow path. This minimizes the effects on the equivalent circulating density (ECD).

The wiper trip BHA included a 6.85-in MAGNOGARD openhole magnet, 9⅝-in HEAVY-DUTY RAZOR BACK* advanced casing cleaning tool (CCT), two 9⅝-in MAGNOSTAR magnets, and a 9⅝-in HEAVY-DUTY WELL PATROLLER* debris recovery tool.



A severely damaged PDC bit was not able to reach TD and created debris downhole. The MAGNOGARD and MAGNOSTAR magnets recovered 44 kg of debris that would have caused further complications to drilling operations had it remained downhole.

Facilitating the successful installation of screens and a liner hanger

The three magnets used in the BHA recovered 44 kg of shavings and flakes from the wellbore. During the operation, the wiper trip BHA was run to the top of the casing shoe at 3,937 m [12,917 ft]; the string was then washed in to TD, and no issues or drag were observed. On bottom, circulation and rotation were staged up, and the open hole was then displaced with invert-emulsion completion fluid. The BHA was pulled back into the casing shoe and the mud system circulated to production screen test specifications.

The BHA was laid out at surface, and the following debris volumes were recovered:

- 11 kg by the MAGNOGARD magnet
- 15 kg by the upper MAGNOSTAR magnet
- 18 kg by the lower MAGNOSTAR magnet.

This allowed Nexen to run the screens to depth and to successfully run and set the liner hanger. The customer is now including the MAGNOGARD magnet on subsequent wiper trips.