

Case study: North Sea

SealBond system reduced remedial cement costs in challenging formation

An operator who was working on an exploration and water injector project offshore in the North Sea encountered an increasing number of remedial top-up jobs after initial attempts to cement the conductor casings securely in place. One of the main factors contributing to this issue was the extremely soft and unconsolidated seabed/surface formations. Baker Hughes was asked to provide a solution.

After several discussions, it was decided to use the Baker Hughes **SealBond™ cement spacer system** to prevent cement fallback and mitigate lost circulation issues.

SealBond was pumped ahead of the slurry, providing integrity to the wellbore and enabling effective cementing without the need of remedial top-up jobs. The drilling and spud parameters were changed and flow rates were reduced to their minimum, as shown below:

- Washed in 5 to 10 ft (1.5 to 3 m) with rotation, 300 gpm, and 5 klb weight on bit (WOB) to assess seabed strength and maintain verticality until the hole opener was bedded
- Drilled the next 10 to 20 ft (3 to 6 m) at ±300 gpm to avoid cratering
- Staged up flow rate with depth to the following schedule, as the hole conditions permitted:
 - 30 to 60 ft (9 to 18 m) @ 500 gpm
 - 60 to 90 ft (18 to 27 m) @ 750 gpm
 - 90 ft (27 m) – section TD @ 1,000 gpm maximum flow rate
- Used low WOB (5 to 10 klb) and high rotation across the entire section to maintain verticality

By introducing the SealBond cement spacer system and lowering spud parameters, cement returns were observed at surface. After the elapsed set time, the hard cement was found 2 to 3 ft (0.6 to 0.9 m) above the mudline, resulting in a flawlessly executed operation.

Challenges

- Extremely soft and unconsolidated seabed/surface formation
- Client reluctance to introduce considerable changes to current/basic surface casing designs and excess volumes
- High expectations of cement to surface solution, such as zero required top-up jobs
- Strict environmental regulations

Results

Zero top-up jobs required since the introduction of SealBond cement spacer system