

Case study: North Sea

Coring solution eliminates core runs, saves operator \$543K USD

A North Sea operator approached Baker Hughes to improve the efficiency of its coring operation in block 20 in the 8½-in section. Competitor offset data showed that cores cut previously had reached a maximum of 120 ft (36 m), requiring several coring runs to obtain the required core for analysis.

To minimize rig time and core costs per foot, Baker Hughes proposed the deployment of its **JamBuster™ jam mitigation system**, which can accommodate three core jams before needing to pull out of hole, reducing the number of trips needed to recover the same amount of core. This enabled field personnel to deploy longer barrel set-ups.

The JamBuster system is run in a modular core barrel configuration. Typically, adding an additional 30 ft (9 m) enables safe activation of the system. For the first well, a 210 ft (64 m) coring bottomhole assembly was run with the JamBuster system and the **HT™ Series high torque outer-barrel coring system**, which is especially beneficial in long core barrel runs.

To improve rates of penetration (ROP), a core bit equipped with **Quantec™ cutter technology** was used.

The operator's initial objective was to retrieve 180 ft (55 m) of core in one run. Coring progressed well, and as the

180 ft cut mark approached, the operator requested that Baker Hughes core an additional 30 ft (9 m). After a risk assessment, continued coring.

In total, Baker Hughes recovered 206 ft (62.8 m) of good-quality core in one run—26 ft (8 m) more than originally planned and 86 ft (26 m) more than previously cut in this block in a single run.

After the positive results from the first well, an even more ambitious 240 ft (73 m) of core was planned for the successor well. The core was cut in 7.5 hours with an average ROP of 32 ft/hr (10 m/h) significantly outperforming the offset data for this interbedded, laminated reservoir sandstone.

Overall, the JamBuster system outperformed the offset data in every way, doubling the core cut per run, nearly tripling ROP, and saving an additional coring run per well.

Using its coring solutions, Baker Hughes saved 32 hours of tripping time, 10 hours of on-bottom time and an estimated \$315,000 USD in operating costs for well one.

For well two, 17 hours of tripping time were saved, 13 hours of on-bottom time and an estimated \$228,000 USD in operating costs.

Challenges

- Obtain cores for analysis from two wells in Block 20
- Minimize tripping time by increasing core barrel lengths
- Increase ROP to decrease cost per foot cored
- Interbedded laminated formation with varying levels of cementation

Results

- Doubled core lengths compared to competitor setup
- Maintained a higher-than-average recovery percentage of 99.11%
- Achieved a 58% increase in core barrel efficiency
- Reduced coring time when compared to offset data
- Increased ROP by 180%

