



Case study: Tornar BOP Cleaner

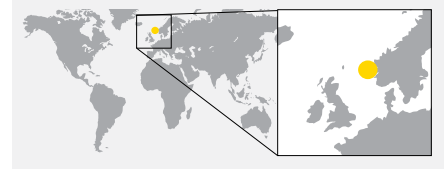
Effective cleaning of Subsea 18.75" BOP stack

Challenge

During drilling operations swarf and magnetic debris accumulate in BOP cavities as fluids are circulated and returned to surface. Operating BOP in such environment can cause damage to the seals, which in turn can lead to expensive repair operation or in worst case malfunctioning BOP in well control situation.

However, cleaning debris from BOP cavities by traditional methods has proven to be especially challenging as the associated technologies have not been optimized for the task. The magnets are too weak, or too small, or both, and the jet subs tend to push debris in to the cavities rather than washing it out.

Suspicion of swarf in the 18.75" subsea BOP stack on COSL Innovator semi-submersible drilling rig prompted the drilling contractor to carry out BOP stack cleaning prior to BOP performance test. Owing to the increased demands of operating in a deep water environment it was imperative for COSL to find an effective and efficient solution to safeguard operations without elevating operating costs.



Region: North Sea
Customer: COSL
Field: Troll
Rig: COSL Promoter
Well type: Oil & Gas

Case benefits

- Reduced BOP downtime and maintenance
- Extended BOP operating performance
- Reduced safety and environmental operating risks

Key capabilities

- Effective well cleaning
- Configuration to suit any BOP requirements
- Drillpipe connection
- One piece mandrel
- Non-rotating stabilizer and magnet
- Most powerful magnets in the industry
- Proprietary Tornar flow port technology

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Solution

COSL selected Archer's 1745 inch Tornar BOP cleaner, a solution that has been specifically designed and developed to remove debris from 18.75 inch subsea BOP stack safely, rapidly and reliably. Tornar technology combines proprietary Tornar flow ports with a powerful industrial magnet to ensure the maximum extraction of harmful debris from the well. The Tornar flow ports positioned within the large body stabilizer create a high-rate drilling fluid cyclone even at low pump rates. A proprietary riser cleaner is also available to maximise debris recovery for subsea applications.

The differential pressure caused by the cyclone generates a powerful suction effect, which extracts any accumulated debris from the BOP and retains it in the drilling fluid – just like a vacuum cleaner. The powerful 1745 inch industrial magnets incorporated within the cleaning string improve the overall efficiency of the system by ensuring the effective and complete retrieval of metallic debris from the BOP and its surrounding area.

Results

The Tornar BOP cleaner proved to be a highly effective solution for the task at hand, with a considerable amount of swarf was recovered from the BOP stack (as shown in figures 1, 2 and 3) and subsequently the BOP test was completed successfully and safely.

Had the BOP test had been conducted without recovering such large volumes of debris from the well, it may have been unsuccessful at best, and at worst may have resulted in permanent damage to the BOP.

Based on the results from the operation COSL have adopted Tornar technology as the primary BOP cleaning solution in order to minimize BOP downtime and maximise operational safety.

Additional information

1st run

- Washed at 4800 lpm - 38 bar
- Clean and remove swarf from magnets, 70 kg recovered.

2nd run

- Washed at 6000 lpm - 56 bar
- Clean and remove swarf from magnets, 25 Kg recovered.

3rd run

- Washed at 6000 lpm - 57 bar
- Clean and remove swarf from magnets, 16 kg recovered.

4th run

- Washed at 4500 lpm - 32 bar
- Clean and remove swarf from magnets, 5 kg recovered.



Figure 1. Swarf recovered by the string magnet during first run.



Figure 2. Close up of string magnet showing volume of swarf recovered during first run.



Figure 3. Swarf recovered by circulation magnet during first run.

We are a global oilfield service company that specializes in drilling services and well services because we believe that specialists do the job best. Our experience drives our difference in a constant search for new ways to deliver better wells. We listen to our customers to provide straightforward solutions to help them produce more oil and gas. We are craftsmen, who take pride in our work and always do what we promise.

We are Archer.