

# Operator Safely Executes Multi-Well P&A Campaign in the North Sea

## BARAMAG™ SWARF SEPARATION AND RECOVERY UNIT EFFECTIVELY REMOVED 95% OF SWARF

NORTH SEA, UK

### CHALLENGES

- » Avoid HSE exposure of swarf handling and containment
- » Reliable swarf recovery system that requires minimum rig up time
- » >90% of swarf recovery to enable the re-use of milling fluids

### SOLUTIONS

BaraMag™ Swarf Separation and Recovery Unit:

- » Quick rig-up and rig-down of flow head
- » More than 95% of swarf recovery through the system

### RESULTS

- » 95% swarf recovered and contained into the skips safely
- » Zero HSE and service quality incidents
- » Zero NPT

### OVERVIEW

A major operator contracted Halliburton Baroid for its Plug & Abandonment (P&A) campaign in the North Sea, UK. The campaign comprised of multiple wells including one in which the first use of a new casing milling technology was required.

The Baroid separation solutions team recommended the BaraMag™ swarf separation and recovery unit designed to provide safe and effective handling of swarf and to minimize the impact of swarf on offshore equipment. Deployment proved successful, recovering over 95% swarf, avoiding non-productive time (NPT), HSE and service quality issues.



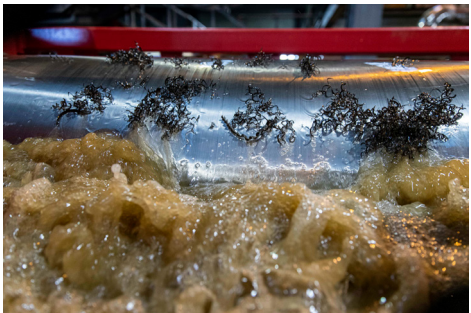
### CHALLENGE

The operator’s key objectives and challenges were to efficiently and safely separate and contain the swarf material into the skips. Failure to remove this harsh metallic material can lead to excessive wear and tear on rig surface equipment; contamination of drilling fluids; and health, safety, and environmental (HSE) risks to personnel. Traditional solids-control shale shakers are not the best tools to remove this significant quantity of swarf from the fluid at surface. Removal of swarf from a milling fluid requires a reliable and efficient means of separation at surface to ensure successful operations.

Milling program were planned to carry out in two sections

Section milling of 30 meters window in 9-5/8” casing from 1,250 m to 1,280 m

Section mill 60 meters window in 9-5/8” casing from 900 m and 960 m



## CASE STUDY

The BaraMag™ Swarf Separation and Recovery Unit was identified as the optimal solution to effectively remove particles and strands of ferrous and ferromagnetic metals from drilling fluids when conducting operations such as milling, abandonment, slot-recovery or side-tracks.

The BaraMag™ swarf separation and recovery unit is designed to separate the swarf from the drilling fluid by mechanical and magnetic means. Return flow from the well passes through the unit, with the first stage capturing the majority of the swarf and discarding the material into a collection skip. A second separation and polishing stage removes fine to ultra-fine magnetic particles that may still be entrained in the fluid. The BaraMag unit offers operators an efficient and cost-effective solution for swarf separation and recovery.

## RESULTS

### FIRST MILLING SECTION

The milling of the first section was successfully completed over two days without any operational impact. This included continuous operation of the system with a rotating crew of specialized swarf handling operators. The section was milled from a depth of 1,250 m down to a depth of 1,280 m giving a total depth milled of 30 m. Total Swarf recovered through BaraMag™ system was 2,074 Kg and was contained into 1 x skip.

### SECOND MILLING SECTION

The milling of the second section was completed over four days. This section was milled from a depth of 900 m down to a depth of 965 m giving a total depth milled of 65 m. Total Swarf recovered through BaraMag™ system 4,755 Kg. and was contained into 2 x skips.

## CONCLUSION

The first successful deployment of the BaraMag™ system allowed for the operator to successfully mill and handle returned swarf on surface without NPT or HSE incidents. The economic value of the returned milling fluid and the minimization of waste were crucial in successful milling and ultimate completion of the P&A scope for that well, maximizing operator asset value.

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