

Equinor Huldra Field

The Equinor P&A team planned to permanently plug and abandon the exploratory well in the Huldra field, located in the northern part of the North Sea.

Equinor required to pull out the 9-5/8 tubular casings, in order to complete the well abandonment.

THE CHALLENGE

Well-deployed tubulars that have been in place for extensive time periods, are very difficult to retrieve because the casing or liner is surrounded by cement or settled barite.

Equinor's first attempt to pull out the 9-5/8 casings failed in 2016 due to the very high loads required.

A second attempt was necessary, but a new method was needed to reduce the axial force required to pull the tubulars to the surface.

Deep Casing Tools were given the opportunity to trial a new prototype tool, the Rubblizer™.

THE SOLUTION

Equinor decided to trial our Rubblizer™ tool for this project.

The Rubblizer™ expands the tubulars within its elastic limits to break the bond between the casing and the surrounding material. This elastic deformation allows the pipe to contract back to its initial shape and be pulled to the surface.

Breaking down the bond between cement or barite and casing, and the structure of the cement or barite behind the casing, drastically reduces the axial force required to pull the tubulars out.

In February 2019, a short top down pass with the Rubblizer™ was executed from the Deepsea Bergen.

THE RESULT

The Rubblizer™ tool was run. The client wanted to prove that the Rubblizer™ could break down the bond between cement or barite and the casing, this significantly improved the pulling force required to pull the length of casing treated by the Rubblizer™.

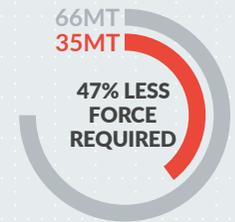
The length of 9-5/8" casing pulled prior to running the Rubblizer™ required 66ton/m of force to pull it free, the 3.5m length over which the Rubblizer™ was run required 35ton/m. This indicates a reduction in force of 31tons/m or 47%.

24 hours rig time was saved based on this 3.5m section of the pull based on similar sections pulled above and below. This equates to a significant cost saving of between \$150,000 - \$200,000 for Equinor.



IN NUMBERS

- Conventional Technology
- Rubblizer™



REDUCED PULLING FORCE

Introducing the Rubblizer™ resulted in a reduction of required pulling force from 66tons/m to 35tons/m.

TRIAL CONCLUSION

The prototype Rubblizer™ tool was designed to prove that breaking down the bond between cement or barite and casing, and the structure of the cement or barite behind the casing, significantly improves casing pulling efficiency.

Proof of this was demonstrated by the reduced force required to pull length of casing treated by the Rubblizer™. Following the trial, the tool is undergoing further redesign and additional testing to improve its robustness before the next field trial deployment.