

CASE STUDY- 2021- NORTH SEA

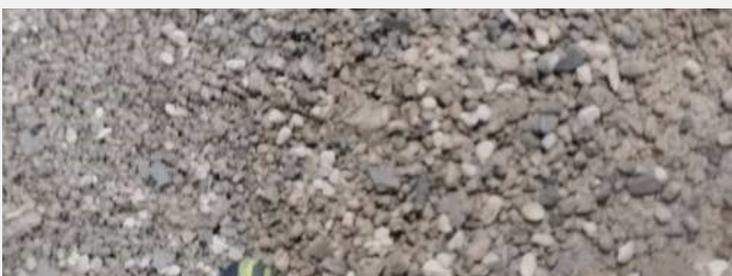
**Stronghold® Barricade® + Systems remediates cemented annulus to achieve high quality bond across the entire 86 meter interval on the Gullfaks field**

**Challenge**

The objective was to permanently plug the main reservoir and the intermediate Shetland formation to facilitate a new sidetrack. There were several challenges to overcome in this well and it was favorable to install the annular barriers as deep as possible just above a 7" tieback packer. The 9 5/8" casing was logged and the annulus condition at the depth was cemented, however most of the interval had patchy cement bond with medium isolating potential. Some of the interval had well bonded heterogeneous cement around the annulus, but not enough continuous bond to comply with company standards and regulatory requirements.

**Solution**

The Stronghold® Barricade®+ System has been very successful in achieving high quality annular barriers across the Gullfaks field for years and was chosen as the solution for that. High cement content in the annulus was risk assessed and planned accordingly. The decision was made to perforate two different intervals. The casing was perforated from 2155-2130 mMD and 2111-2069 mMD with the overall goal of achieving 86 meters of continuous high-quality cement. The next step was to wash the perforated intervals, and that was done effectively with declining standpipe pressure and large amount of cement coming over that shakers. The large amount of cement over the shakers was a testament of the efficiency of the Stronghold® Barricade®+ Systems. It clearly shows the capabilities of restoring barriers by removing patchy cement and provide a new high quality cement plug across the interval. The operation was completed with a flawless cement job utilizing the uniquely engineered Pump and Pull method that is specific for the Stronghold® Barricade®+ System.



**Result**

The result of the Stronghold® Barricade®+ System operation was a milestone for both Archer and Equinor. After the cement set up it was drilled out and the annulus was re-logged to verify the effectiveness of the operation. The resulting logs showed continuous high quality cement bond across the entire 86 meter interval. The objective was met, and the complex dual interval operation was successfully executed with industry leading performance.

**The Stronghold® Barricade®+ System has proved its efficiency in a cemented annulus setting a new benchmark for the system going forward.**

