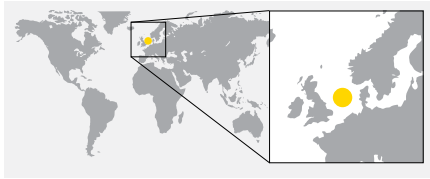


# Stronghold Barricade™ System Extends Lifetime of 2 Wells By Remediating Sustained Casing Pressure



**Region:** North Sea  
**Customer:** Major Operator  
**Field:** Danish Continental Shelf  
**Well type:** Gas Producer

## Case benefits

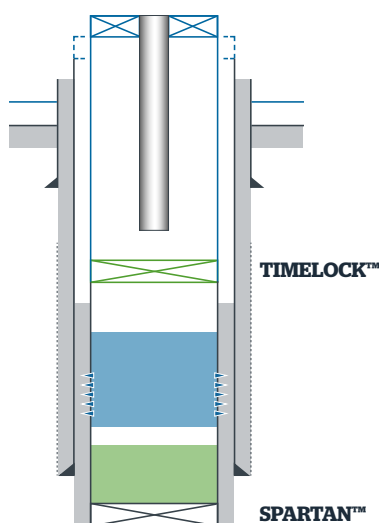
- Eliminates the need for casing milling.
- Ensures controlled direction of cement placement.
- No need of wait on cement (WOC) with squeeze pressure.
- Eliminates need to squeeze cement.
- Single casing perforation gun
- Easy and rapid deployment
- Flexible set depths and angles
- Reduces operational time
- Extends lifetime of well

## Key capabilities

- Field proven
- High circulation rates
- Dual swab cup design
- High performance swivel
- No set weight needed below

## Typical Applications

- Permanent plug and abandonment (P&A)
- Slot recovery
- Workover
- Seal annular pressure



## Challenge

A major operator in the Danish continental shelf had several wells with sustained annulus pressure. The challenge was to remediate the annulus pressure. The operator needed to conduct a workover to extend the lifetime of 2 wells.

The objective was to isolate the lower completion and carry out cement remediation of the B annulus just inside the 13 3/8" casing shoe. The wells would then be suspended and the B annulus pressure monitored to confirm that it had declined and stabilized over a monitoring period of -1 month before installing a new cemented tie-back casing string and upper completion. This solution would maintain the production from the wells from the 4 1/2" completion with same production rate as previously.

## Solution

The solution for isolating the lower completion was Archer's 9 5/8" **SPARTAN™ plug**, designed for the customer's requirements. The plug was set and tested, and the lower completion was isolated. On top of the SPARTAN plug, a 300ft Hi viscosity pill was spotted. The next step of the operation was to isolate the sustained annulus pressure, using the **Stronghold Barricade system**. The field proven Barricade perforates, washes, and cements the annulus, creating a rock to rock barrier in just one trip.

For this application, the **Tubing Conveyed Perforation (TCP)** guns were run with a shot and pull system, as the well required recompletion. The 9 5/8" casing was successfully perforated just inside the 13 3/8" with the unique PUNC charge, which perforated the 9 5/8" casing without damaging the 13 3/8" casing on the outside. The operator could then have full integrity of the 13 3/8" casing and set a barrier to isolate the sustained annulus pressure in the annulus between the 9 5/8" and 13 3/8" casing strings.

The next step was to wash to perforations and cement the annulus to isolate the sustained annulus pressure. The washing of the annulus was challenging due to high amount of solids within it. The perforations had to be washed several times. From the cleaning, it was evident that there was a large amount of debris coming over the shaker system, and the declining standpipe pressure. When the washing sequence was completed, the wells were circulated with 600 GPM and 120 rpm rotation until only clean mud came over the shakers.

The cement job was performed using a pump and pull method. The Barricade's dual swab cups diverted the cement flow accurately into the perforations. The swab cups ensured that the annular space was cemented and full lateral isolation was achieved. The cement plug was tagged within the expected window, and made ready for a B annulus monitoring period of 1 month. The wells were secured with a **TIMELOCK™** suspension plug and the remediation of the B-annulus was complete.

## Result

The result was a B annulus pressure that declined from approximately 300 psi before the job, and stabilized on 24 psi after the monitoring period. After bleed off the pressure stabilized at zero psi completing the objective. The customer was able to recomplete the wells and extend their lifetime.

## LONG TERM B-ANNULUS MONITORING



**STRONGHOLD™**

Archer is a global oil services company with a heritage that stretches back over 40 years. With a strong focus on safety and delivering the highest quality products and services, Archer operates in 40 locations over 19 countries providing drilling services, well integrity & intervention, plug & abandonment and decommissioning to its upstream oil and gas clients. **We are Archer.**

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