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ConocoPhillips equinor Harbour Energy OKEA PETROBRAS REPSOL TotalEnergies

What we do

Multi-Operator **collaboration** accelerating the rate in which technology is developed, tested and piloted for **well decommissioning.**

Discover more

Alternative
Barrier Materials

Alternative materials used solely or in composite barriers have potential to provide more reliable and resistant isolation compared to cement.

Inspection and
Verification

In recent years there has been a technology race between several vendors in the Through Tubing Cement Logging (TTL) space, with significantly different approaches taken.

Enabling
Technologies

Enabling technologies provides through tubing services to perform a wide range of task to support barrier placement.

From cutters to slotters and everything in-between.

Strong Delivery

£5.37M
Invested with industry, academia & government

£4.77m
Leveraged from industry

5.87+ Mt CO2e
Abated by 2030 (forecast)

19
Completed/ Live Projects

35+
Technologies screened

33
Field trials completed, planned or underway

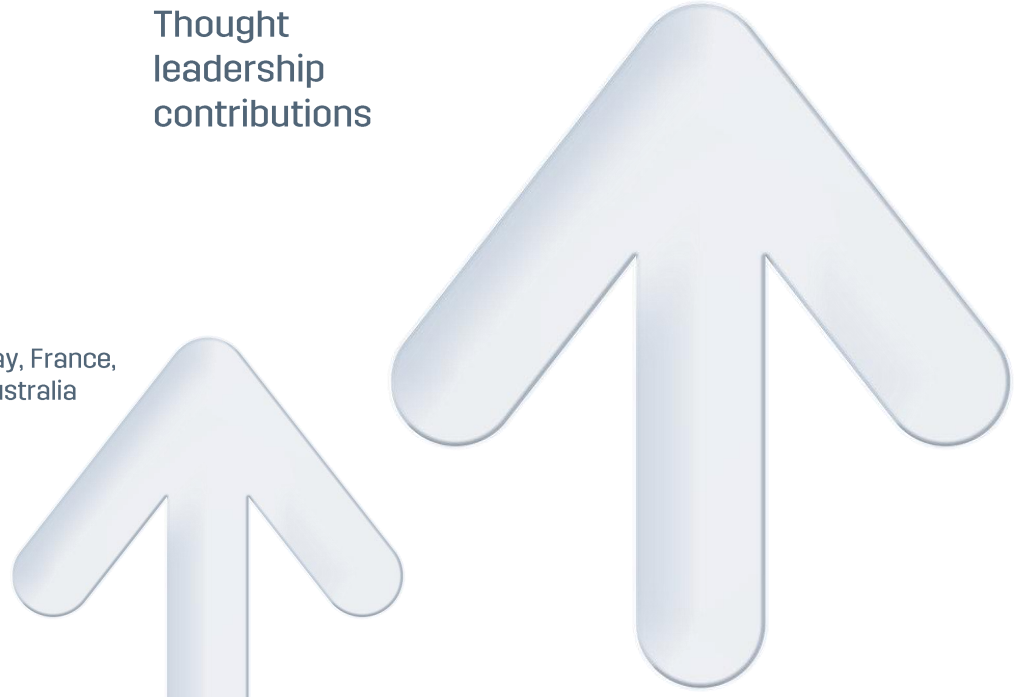
7
Supporting operators

3+
Thought leadership contributions

7 Wdc
The Wells Decommissioning Collaboration
3000

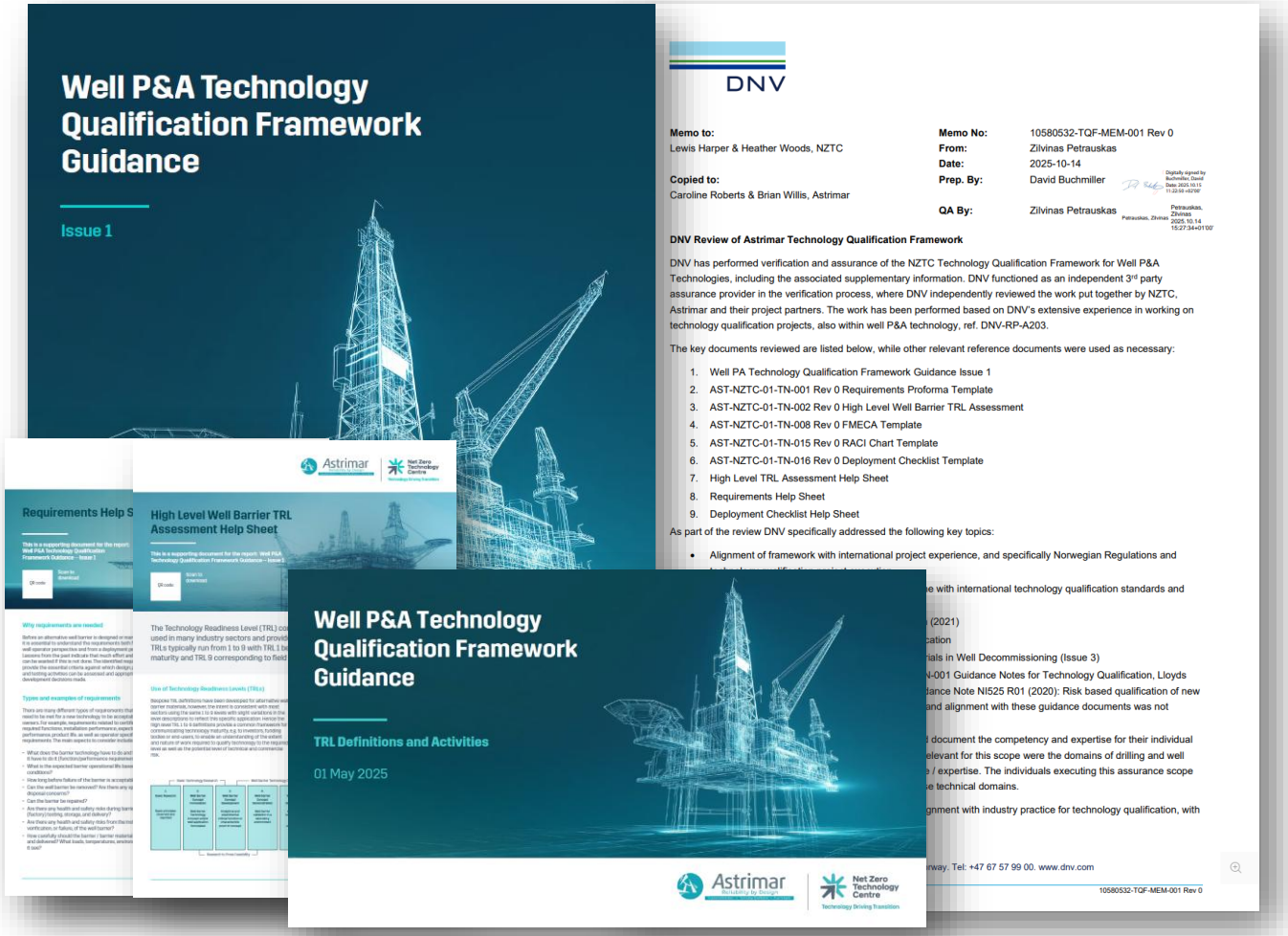
4
Continents
North America, South America, Europe and Oceana

8
Countries
Brazil, America, UK, Norway, France, Denmark, Netherlands, Australia



Case Studies: Global TQ Framework

To streamline the acceptance and use of alternative materials for use in the permanent plugging and abandonment of oil and gas wells



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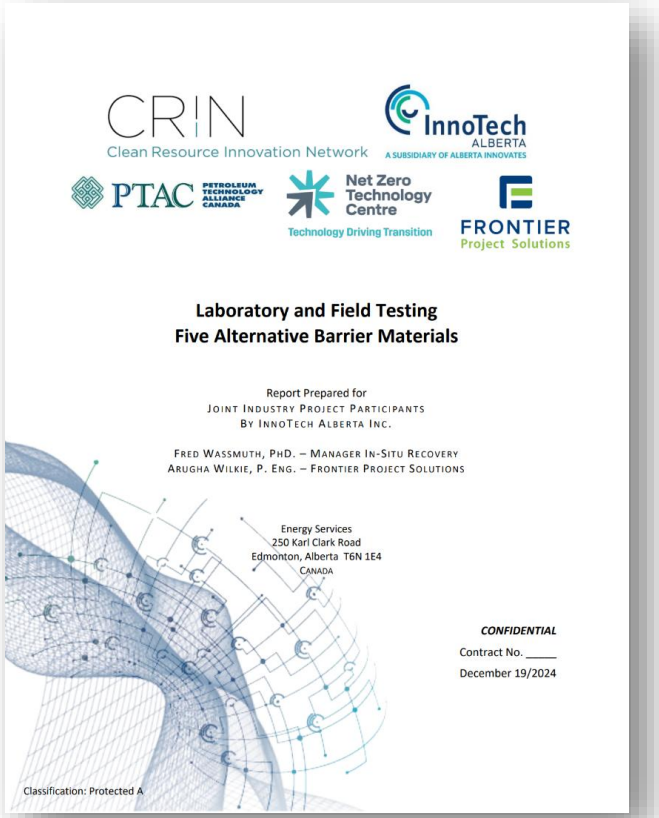
- Applies principles and processes from established Technology Qualification Processes such as DNV-RP-A203.
- Incorporates requirements from regulations and standards around the globe such as OEUK and Offshore Norge.
- Bespoke to unique application of Alternative Materials for Well P&A.

Standardised framework across multiple operators and regions, applicable to all material and barrier types which enables early engagement with regulators and similar bodies.

Reviewed by DNV.

Case Studies: CRIN Alternative Products JIP

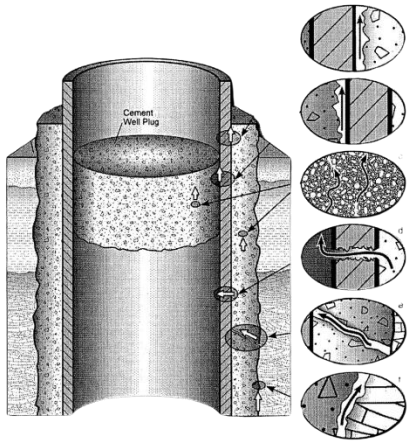
Canadian collaboration to accelerate local and international acceptance for cement alternative sealing products by testing them on fifteen oil and gas wells.



Alternative Products Consortium

The objectives of the project were to deliver products that had a performance superior to cement, reduce greenhouse gas emissions from leaking wells by decreasing the number of inactive wells and overall reduce financial liabilities whilst creating business opportunities for Alberta and Canadian companies.

The process steps to achieve these objectives were:



1. Rapid laboratory testing of alternative materials to achieve regulatory acceptance.
2. Subsequent field trials of the accepted technologies.
3. Publicise the results to gain market acceptance.

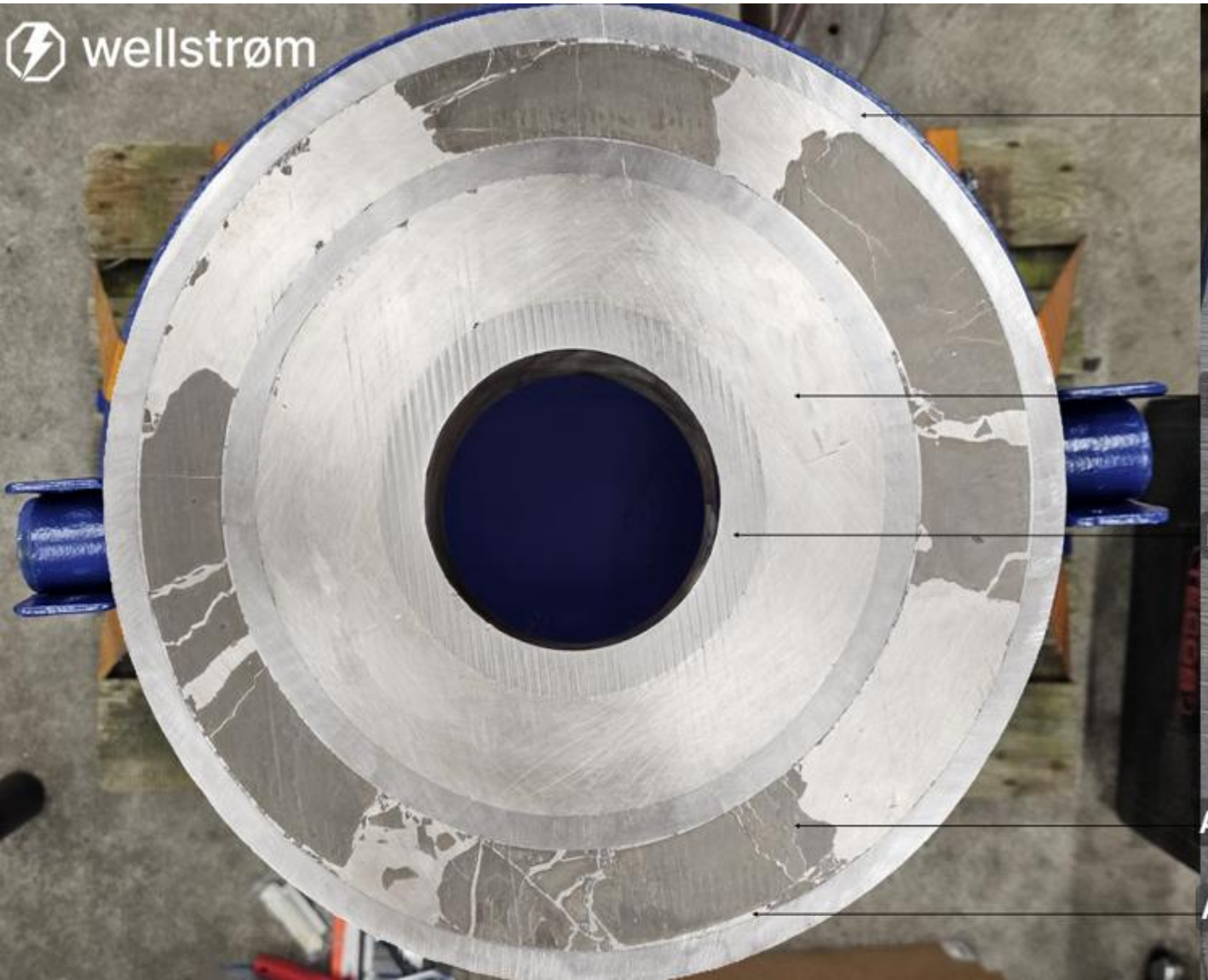
6
Products tested in the lab

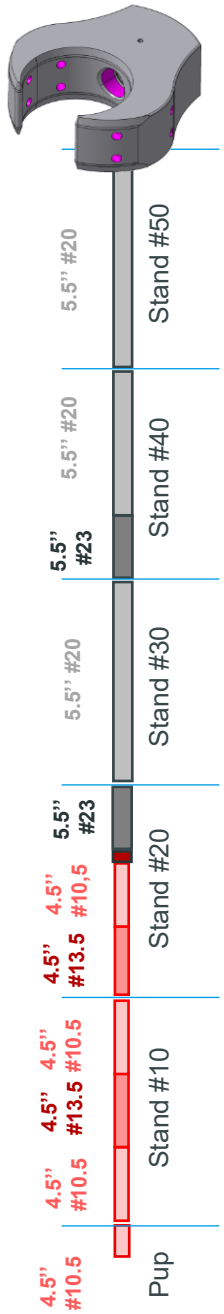
4
Products taken to the field

15
Wells Plugged

Case Studies: Wellstrom T1000 Bismuth Plug

Electrically run bismuth plug than enables abandonments offline and CAN HALVE THE COSTS OF P&A in comparison to section milling and cement remediation.



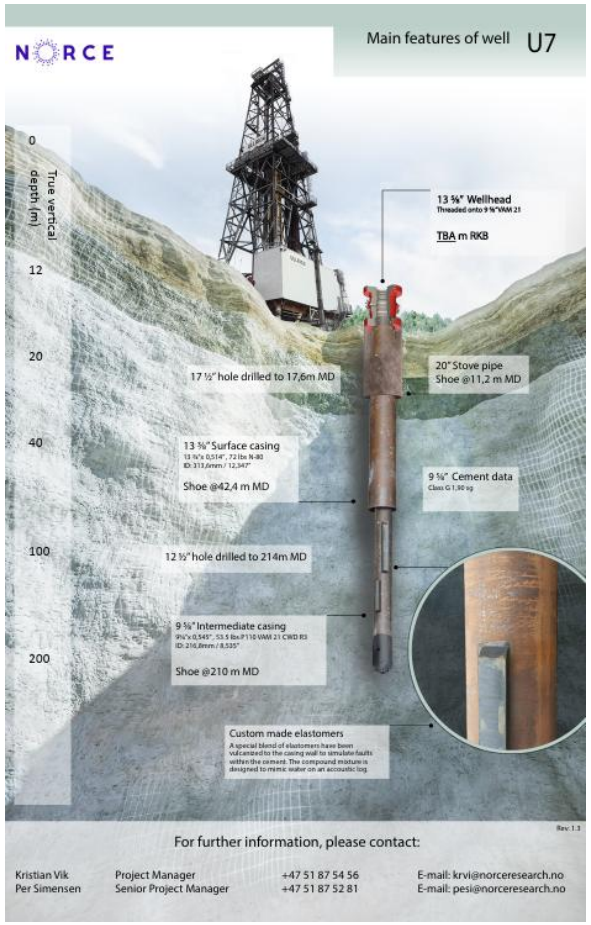


Case Studies: Thru' Tubing Log-Off

Who is going to crack it first? In partnership with Islay Subsurface

7 Wdc
The Wells Decommissioning Collaboration
3000

Vendor	Current Technology Name	Measurement Type				Processing			Tubing Evaluation			Casing Evaluation	Cement Evaluation			
		Acoustic	Nuclear	ElectroMagnetic	X-Ray	Machine Learning	Time Domain	Frequency Domain	Tbg Eccentricity	Tbg ID	Tbg Thickness (azimuthal)	Csg Thickness (azimuthal)	Top Cement	Bond Index	Chanelling	Ann A fluid



In recent years there has been a technology race between several vendors in the Through Tubing Cement Logging (TTL) space, with significantly different approaches taken. As one would expect, with different Research and Development budgets, different resources allocated, and manner in which the vendors have approached both tool design and processing, the race has not been equal!

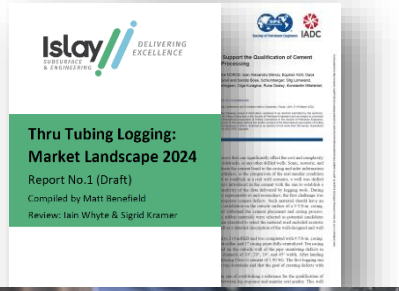
The work comprises of two principal phases with this report summarising Phase 1:

- An overview of through tubing logging for cement evaluation and the various methodologies that are typically employed.
- Companies in the TTL arena – including status of technology development and expected timelines for commercial availability.
- Evaluation of the tools available for thru tubing logging from the four major service companies in the market at moment, in comparison to smaller, independent technology companies.
- The Collaboration will then decide on which companies/technologies to pass through to Phase 2 for the shoot-out at Ullrig.

slb HALLIBURTON CEREUS ULTRASONICS CONNELL WellGuard pd Roke

Case Studies: Thru' Tubing Log-Off

Who is going to crack it first? In partnership with Islay Subsurface



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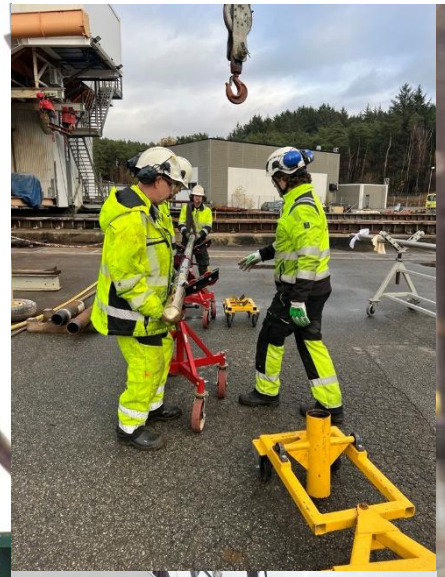


Case Studies: Axter Retrieve

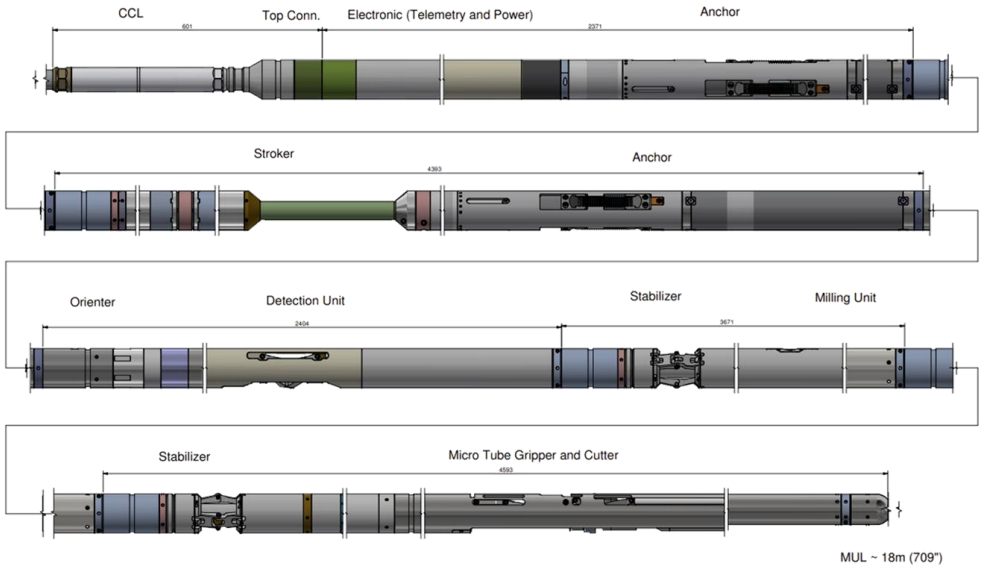
The enabler for permanently leaving the tubing string in the wellbore by removing the control line outside the tubing string to permit cementing/plugging the tubing in place.

Operations performed in Ullrigg well U-08 by TE
Tubing size: 4-1/2" 12.6ppf. L80
Casing size 9-5/8"
Operations depth: 545 - 557mRKB
Well inclination at depth: 27°

Total Energies & AkerBP successful control line retrieval
Ullrig, Stavanger
27th January 2025

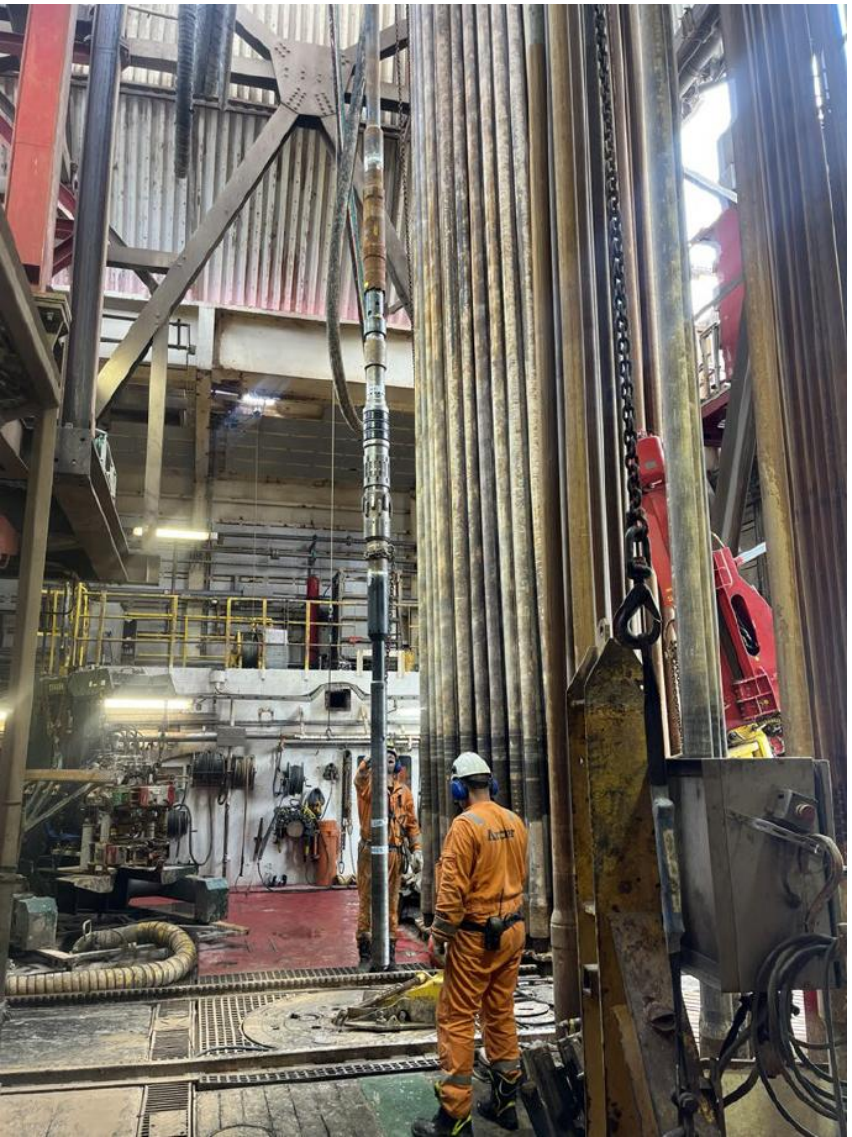
Axter Retrieve Tool String

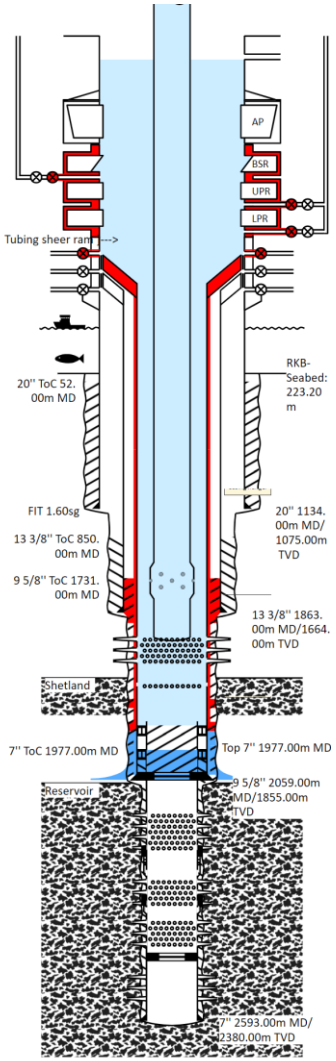
Axter Retrieve Operations - Ullrigg U-08
RIH to position toolstring for lower control line cut (557mRKB)
Identify position of control line, mill window and cut control line. - Total operation time 4 hrs. 10 mins.
Position toolstring for upper control line cut (545mRKB).
Identify position of control line, mill window and cut control line. Retrieve cut control line to surface. - Total operation time 5 hrs. 10 mins.



Case Studies: Exedra Balder Tracer Gas Tool

Tracer-gas-based verification method for P&A operations jointly funded by NZTC, NORCE and The Norwegian Research Council.





Three examples of cost reducing P&A methods enabled by Exedra.

Dual PWC barrier. Today's method of CBL log of casing does not apply to dual casing PWC. Hence, there is a need for an alternative verification method. The need is amplified by the challenges of ensuring good sealing beyond the first casing. Using dual PWC will eliminate the time-consuming pulling of the casing or section milling.

'Tubing left in hole' barrier. Leaving tubing in hole will for many P&A operations enable rigless operations, with significant cost reduction, compared with using a semi-sub drilling rig. Note: this proposed method is based on pressure response from Balder tool, not tracer detection.

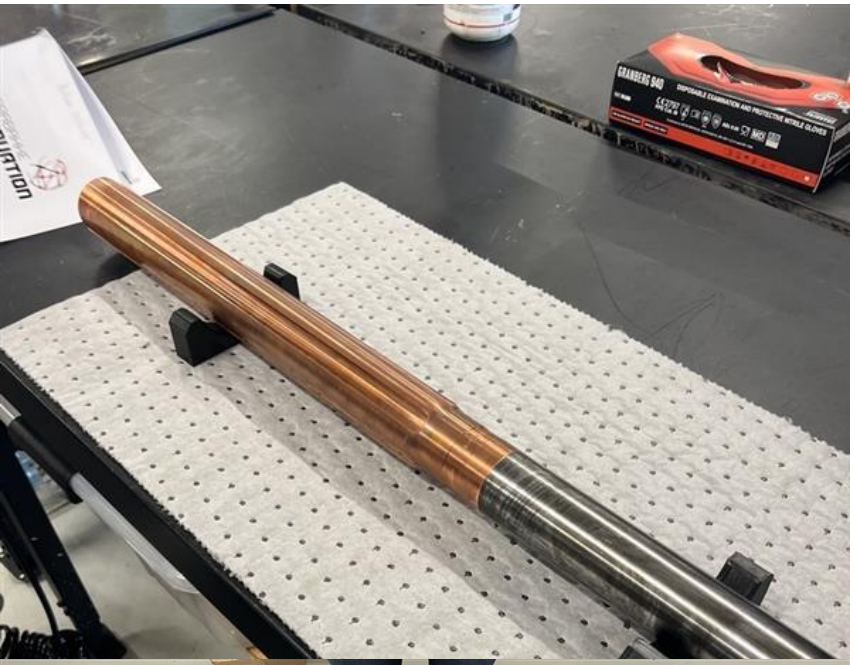
Short plug lengths, such as with bismuth. Bismuth is impermeable and expands while curing, hence giving a high-quality barrier. Due to the short length (typically 2-3 meters) it is critically important to verify properly. Bismuth plugs can also be set from LWIV.

The pilot comprised of the following objectives and results:

- To demonstrate detection of injected ethylene tracer gas below a PWC barrier.
- To demonstrate downlink functionality of the Balder tool.
- Demonstrate planning and execution including gas filling which the procedure was observed and certified by DNV.

Case Studies: AAI Hydrate Melter Petrobras Pilot

Removing the plugs before setting the plugs...



Piranema 13 400m Hydrate Plug Pilot Well

When a hydrate plug is discovered within the Christmas tree or production string, the preferred solution is to reduce hydrostatic pressure using nitrogen or a lighter fluid.

However, many wells operate within strict pressure envelopes, and such pressure reduction can compromise well integrity.

There is an alternative of circulating heated fluid with coiled tubing but it is not so efficient. Therefore, a thermal tool could be employed to melt the hydrate plug after a glycol slug has been positioned above it.

In most of the cases the hydrate plugs inside the production string or (Wet Xmas Tree) are not that lengthy. **The desirable solution comprehends a tool that could be continuously fed by the standard wireline cables.**

Regarding Piranema 13, this well, nearing plug and abandonment (P&A), presents an ideal opportunity to test the tool. Hydrate formation is virtually certain in this well, eliminating the need to mobilize the tool from intervention to intervention until encountering hydrates. Based on offset well data, up to 400 meters of hydrate formation is anticipated in PRM-13.

This well was used to inject gas in the reservoir from 2011 to 2020.

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