ICOTA November 2024

Well Ops UK Q7000

A year in Australia

Helix
ENERGY SOLUTIONS

Q7000

Launched in 2019 for the UKCS

Riser based DP3 asset 80-3000m capability

Fast and safe service changes, fully equipped with wire, CT, cement

Multiple campaigns in Nigeria 2020> before heading to NZ in 2023

2024 - Australia

2025 - Brazil

CASE I

Objectives

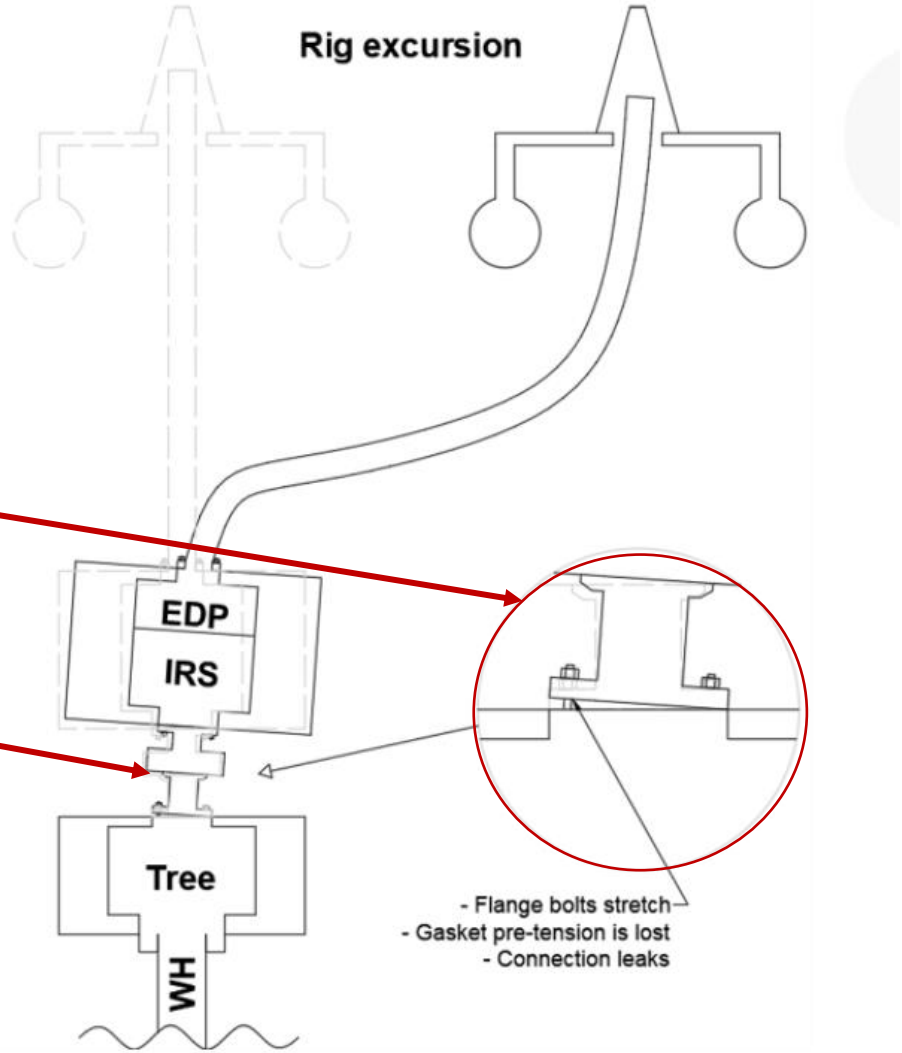
- Permanent Abandonment of reservoir on 7 wells
- Remove and recover 7 XT’s
- Deploy and install ROAM to act as environmental barrier to recover tubing open water
- Recover production tubing to allow intermediate barrier placement to isolate aquafer zones
- Recover remaining subsea infrastructure

Challenges

- Annular cement verification, potential for remedial cement repair
- New equipment (ROAM and WellGear Power Swivel)
- Intermediate plug placement
- Flushing existing manifolds with no production facility in place
- Cutting and removal of control lines from abandonment barriers
- Weather (Bass Strait in winter)
- Weak XT Re-entry hub

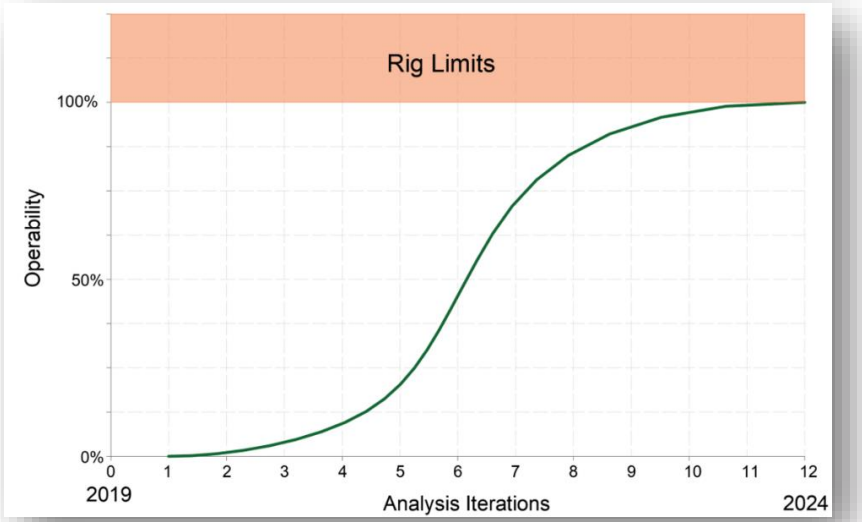
WEAK CONNECTION

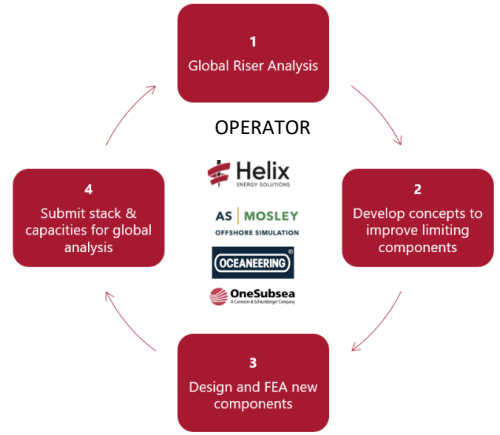
- The vertical tree system had a high connector capacity
- The re-entry hub had a very low capacity
- Could / would lead to a loss of containment at the sealing face below the WC barriers

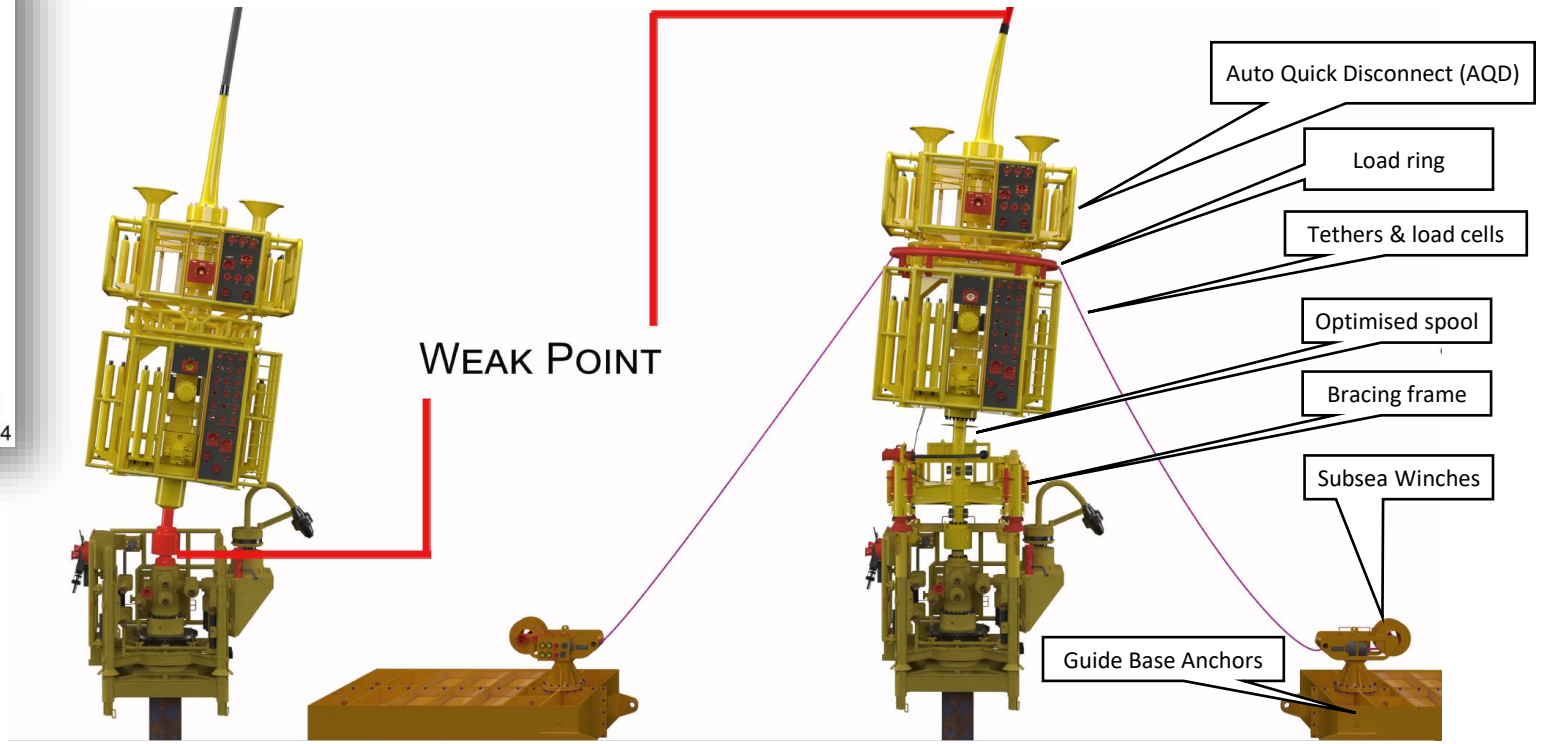


ENGINEERED SOLUTION

- 000’s of engineering hours
- Bracing and gravity bases for tethering added increasing the operability

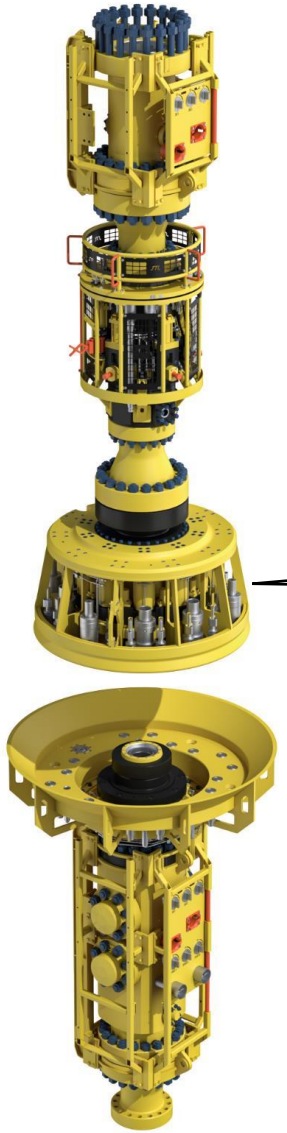






LIGHTWEIGHT SYSTEM

Riser to surface with High Angle Disconnect

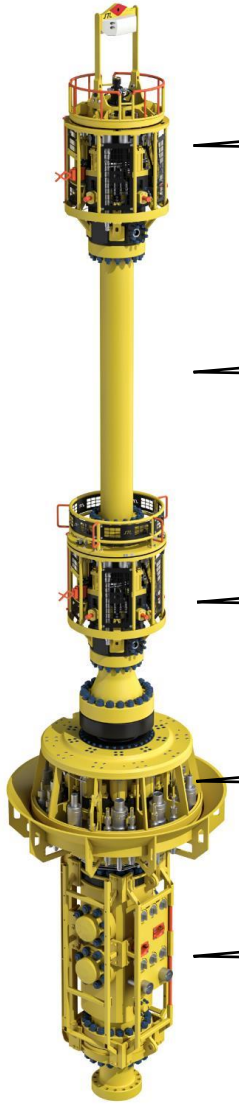


SLIC technology

XR technology (Optional)

Coil Shear seal ball valve technology

Hybrid Riser/Riserless IRS/SIL



SLIC technology

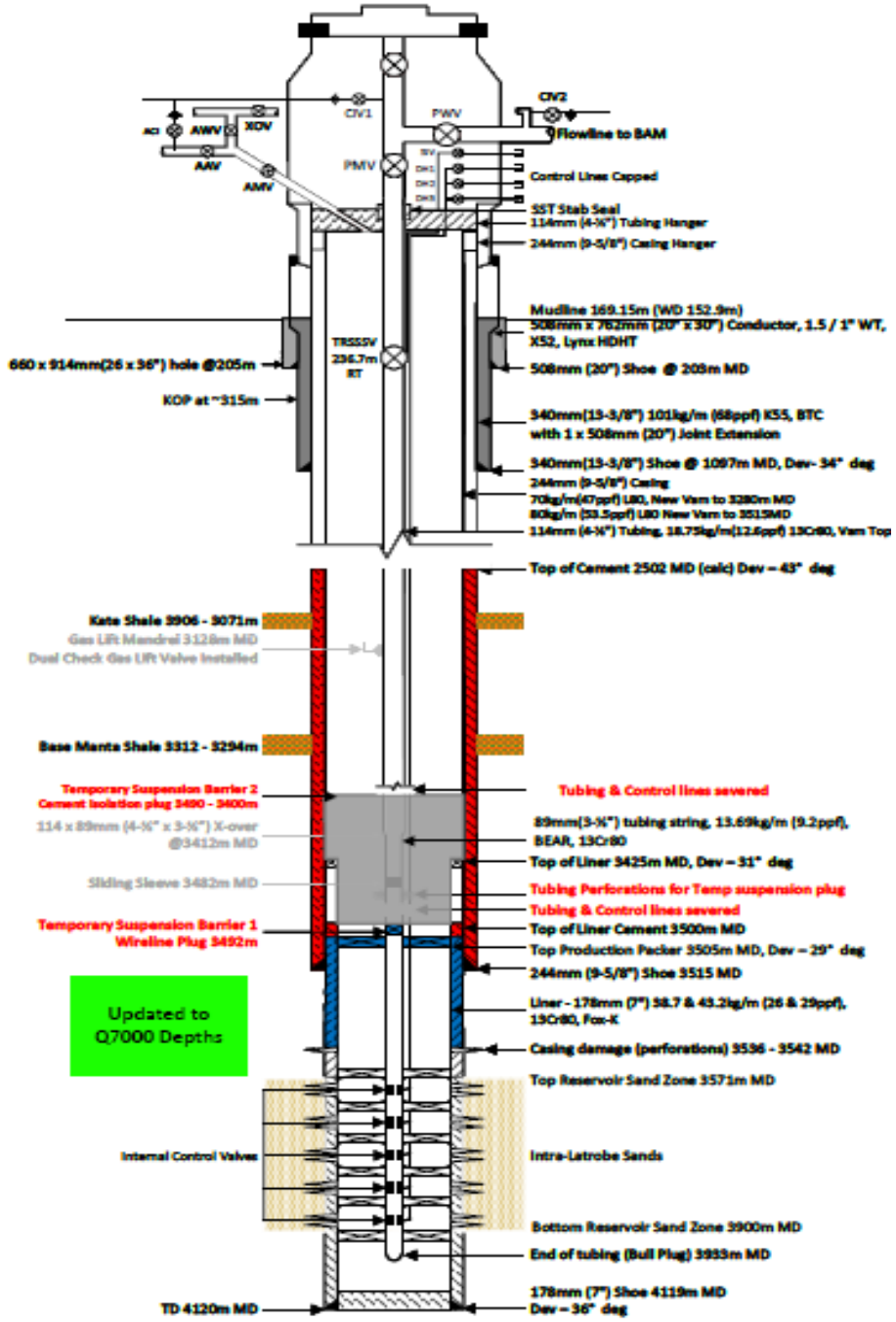
Lubricator pipe

SLIC technology

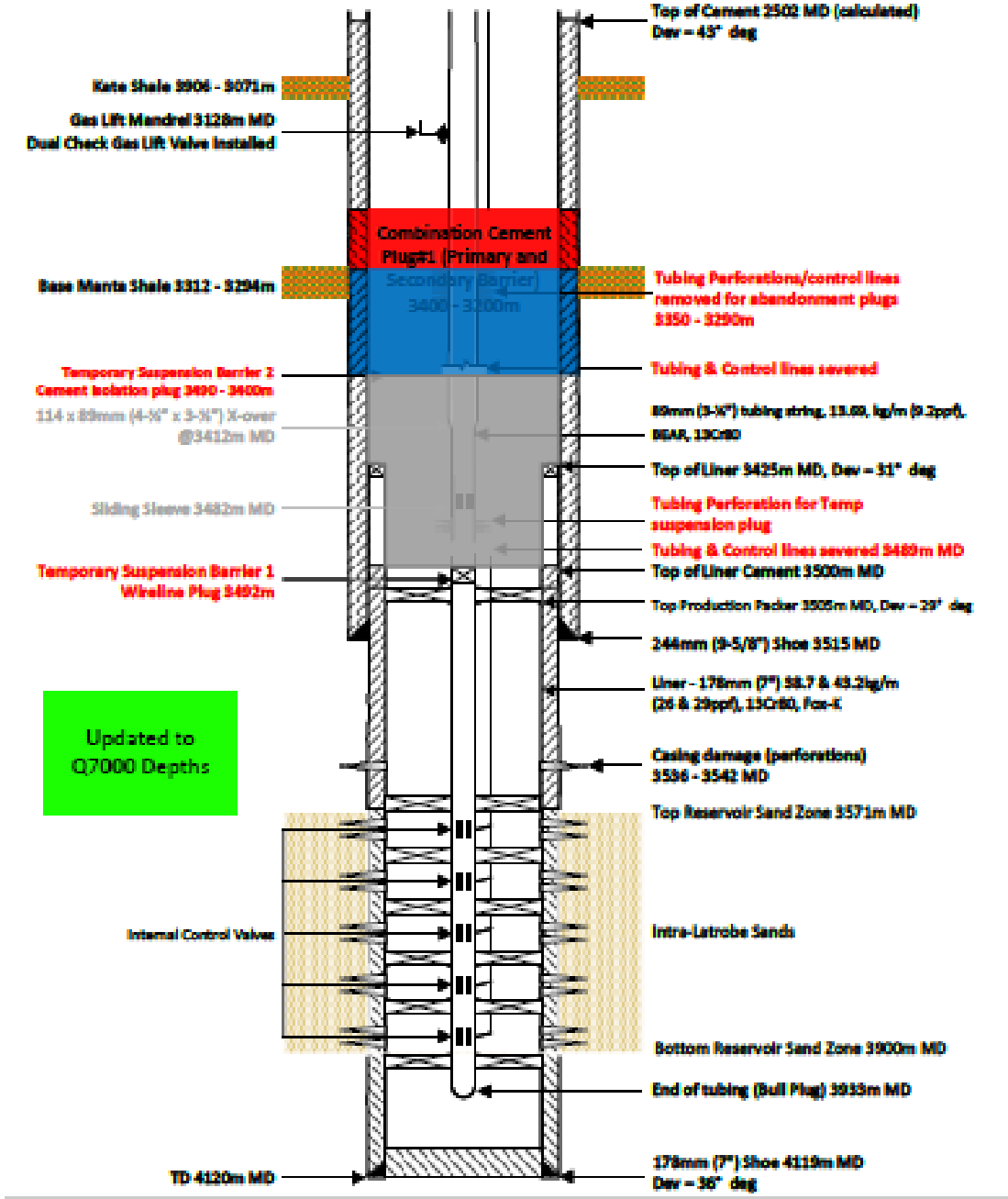
XR technology

Coil Shear seal ball valve technology

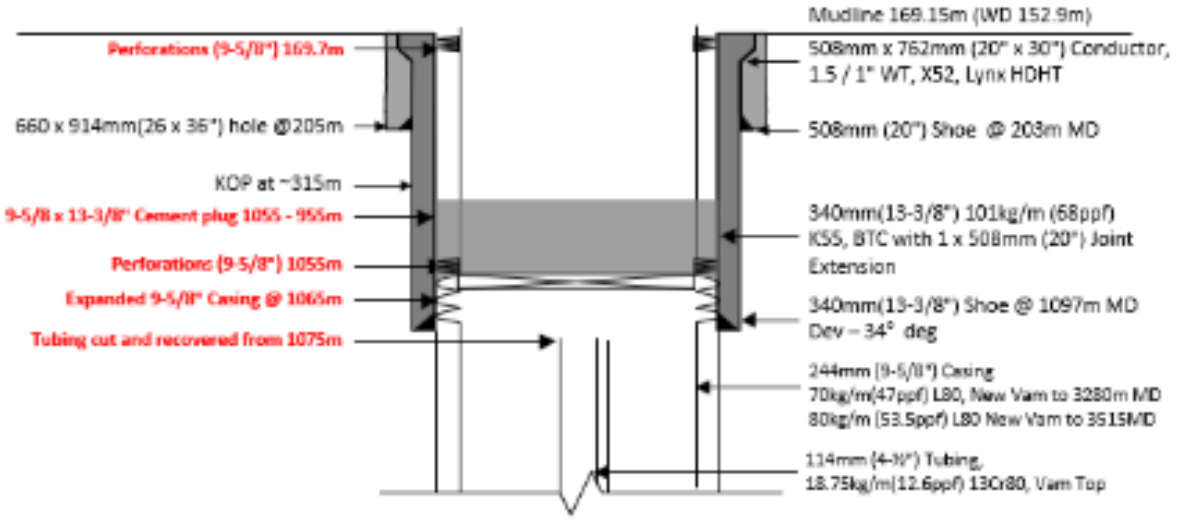
Well Suspension



Well Abandonment – Reservoir



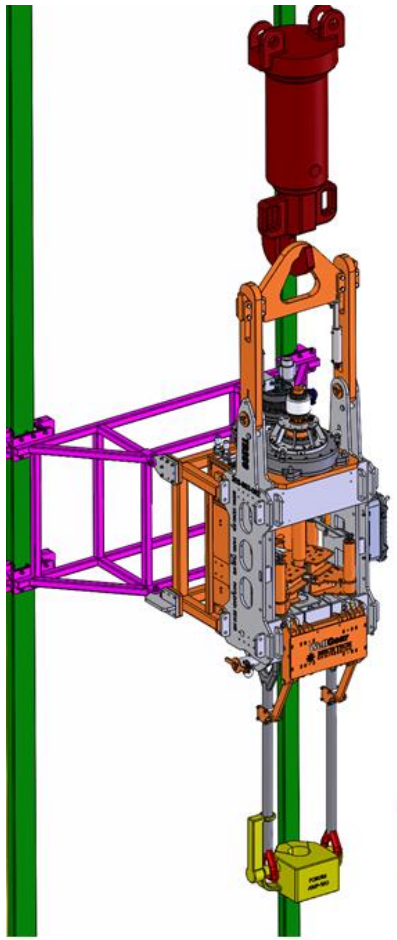
Upper Abandonment Plug

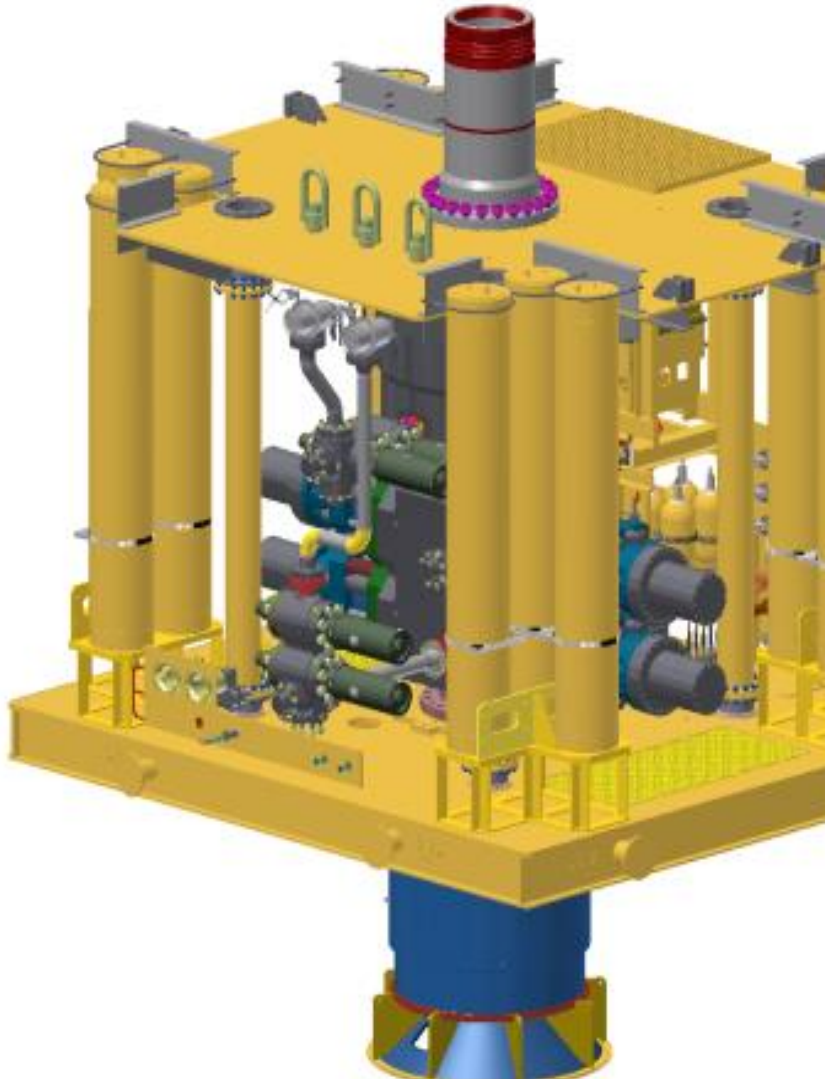


MEGA PACKER GOES LIVE IN AUSTRALIA

OUTCOME

- All 7 live wells were fully abandoned
- ROAM and Power Swivel utilised to recover in total of 10172m of production tubing (World First for ROAM)
- ROAM used on 7 wells successfully
- Schlumberger Epilogue Tooling utilised successfully to log multi-string cement
- IRS hopped over 7 well campaign
- ROAM successfully remained subsea for all 7 well abandonment





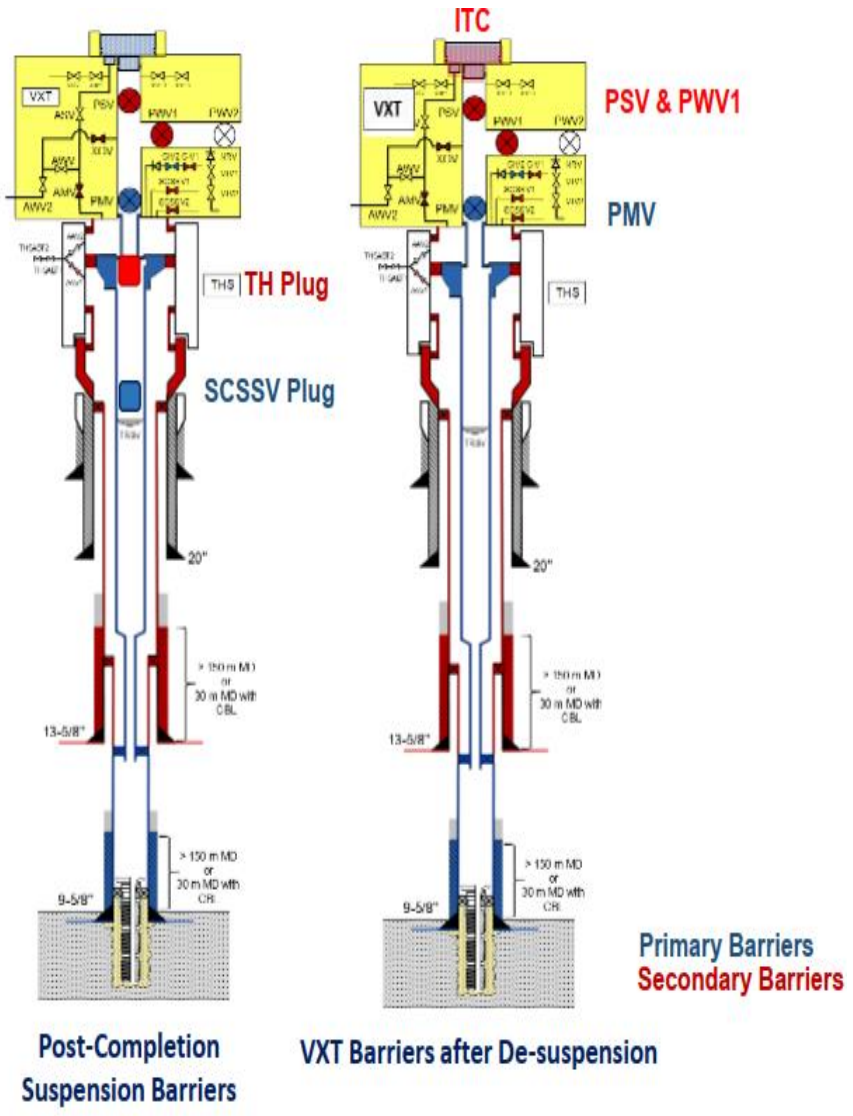
Technologies Used

- Mega-Packer – Used to expand the 9-5/8” casing to close the annulus to prevent annulus cement slumping
- Gator Tool – Mechanical Perforating Tool, run on CT to carry out multi-depth punches
- Schlumberger Slim Epilogue – Allowing multistring logging in 5-1/2” Tubing
- OSS / Helix – ROAM
- WellGear – Power Swivel

CASE II

Objectives

- De-suspend 4 wells
- Complete XT commissioning for newly installed XT’s
- Install and test ITC’s on all wells
- Standby support during wells start-up



CASE II

Challenges

- New riser being utilised, 9-5/8” casing run requiring new TRS
- Hydrostatic pressure opening SCSSV inadvertently
- Large volume gas to surface

Outcome

- All 4 wells successfully de-isolated
- All 4 wells started on production
- All 4 XT’s commissioned
- All 4 ITC’s installed and successfully tested

Timings over the same manifold (215m depth)					
IRS Deployment	**Well #1**	**Well #2**	**Well #3**	**IRS Recovery**	**ITC Installation**
80hrs	29.75hrs	27.5hrs	22.75hrs	18.25hrs	34.25hrs
3.3days	1.24days	1.15days	0.95days	0.76days	1.43days

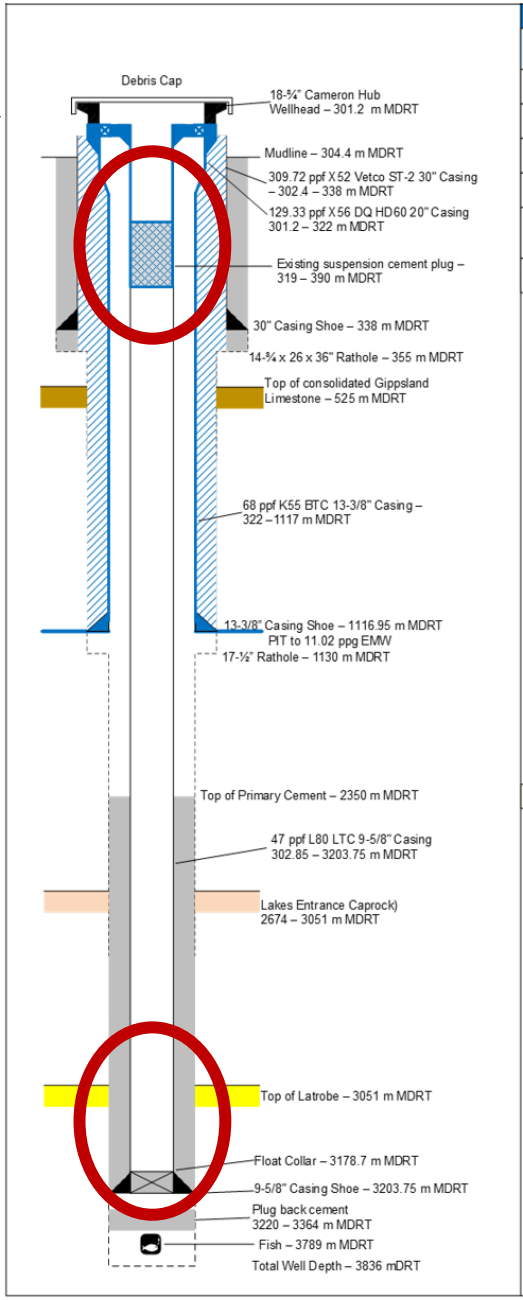
CASE III

Objectives

- Permanently Abandon 2 exploration wells in the Bass Straight
- Verify Annular cement
- Mill out existing suspension cement plug and install new permanent well barriers adjacent to the cap rock
- Install Intermediate Barrier to isolate Aquafer Zone

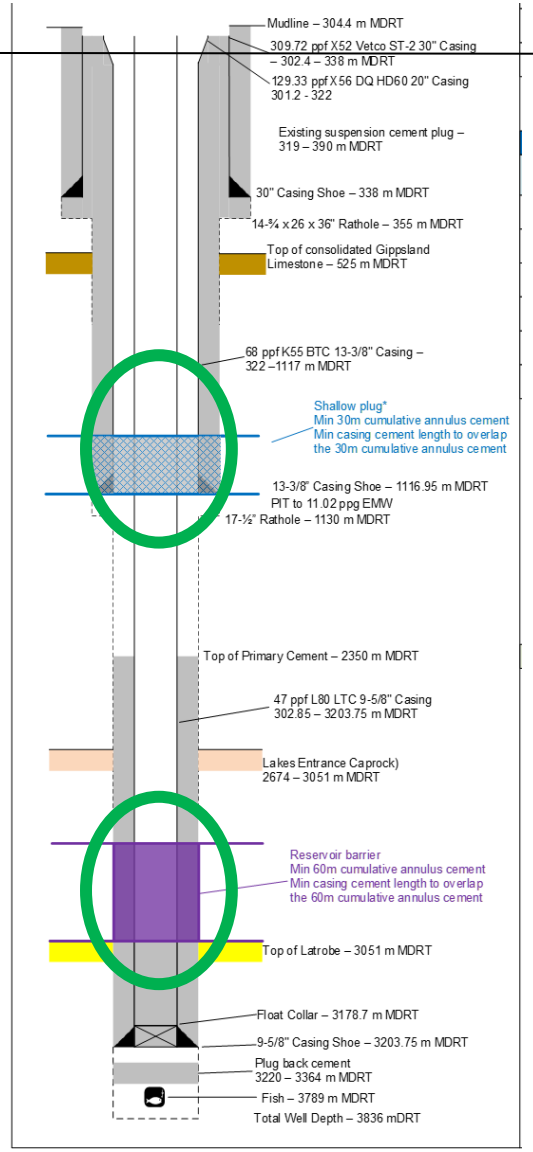
Challenges

- Wellhead sealing faces exposed to environment for long periods of time (no XT in place)
- 2-3/8” coiled tubing used (Q7000 first)
- Well Condition due to aging asset not being preserved effectively.
- Wellhead severance at 401m water depth



OUTCOME

- Both suspension cement plugs milled successfully
- High efficiency of solids recovered and handled on the Q7000 using Schlumberger PowerPro Milling Fluid and WellGear Compact shaker system.
- Annular cement verification completed using Schlumberger Epilogue
- Cement squeezed in to 9-5/8” annulus and verified by CBL
- Intermediate Cement Plugs placed to isolate potential Aquafer zones
- Both wells fully abandoned
- Wellhead successfully severed and recovered, 401m water depth is the deepest severance completed using the Claxton MSCT

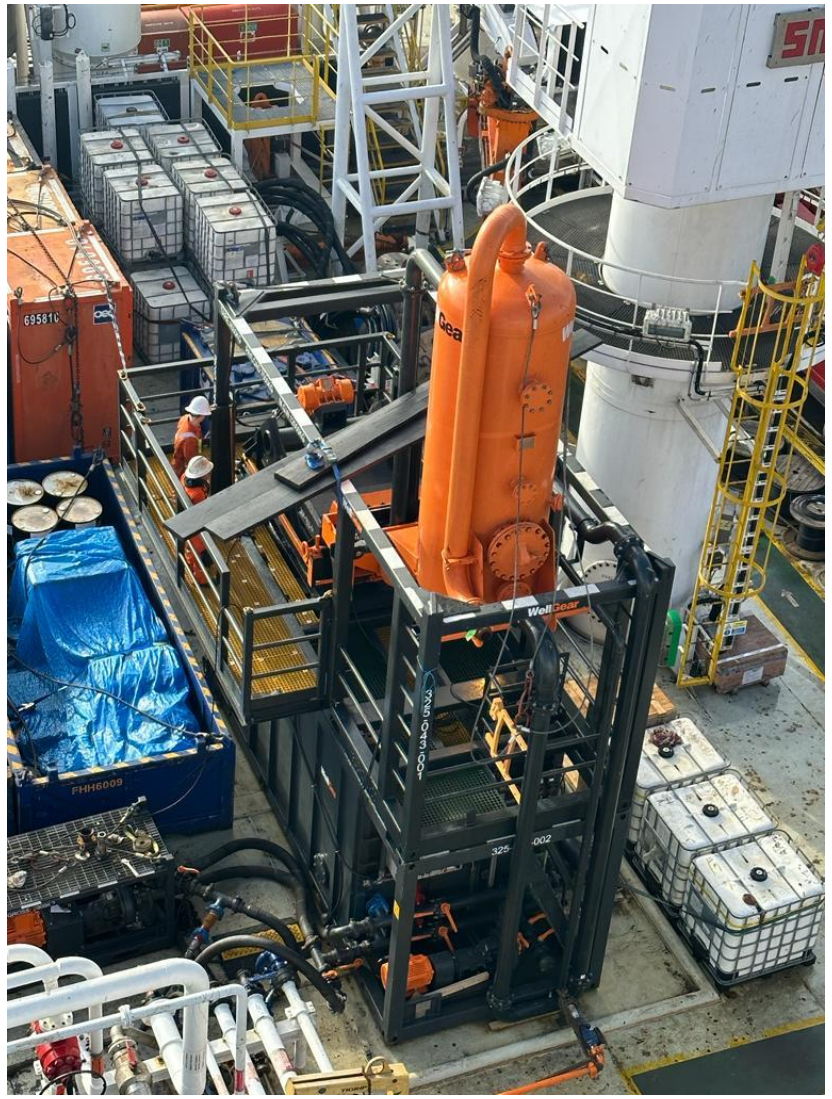


P&A RELEVANCE TO THE UKCS

More and more complex challenges being addressed by LWI as technology evolves

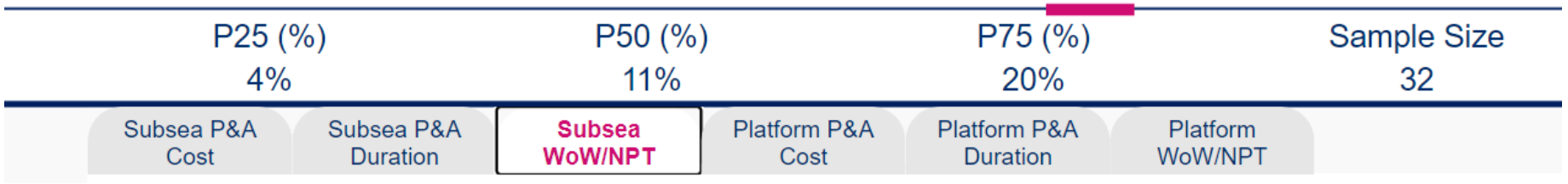
The more complex downhole scopes (cement milling/underreaming) to set new AB1 and AB2 plugs on CT as per the previous Case Study uses equipment mobilised from the UK that fits on Well Enhancer using its riser based Coiled Tubing

Recently in the UK Seawell undertook a well P&A rather than the rig option. Divers were required for complex barrier testing to gain access then through tubing AB1 cement abandonment rigless and riserless without any need for tethering, bracing or anchor handling in 19 days at <£6m

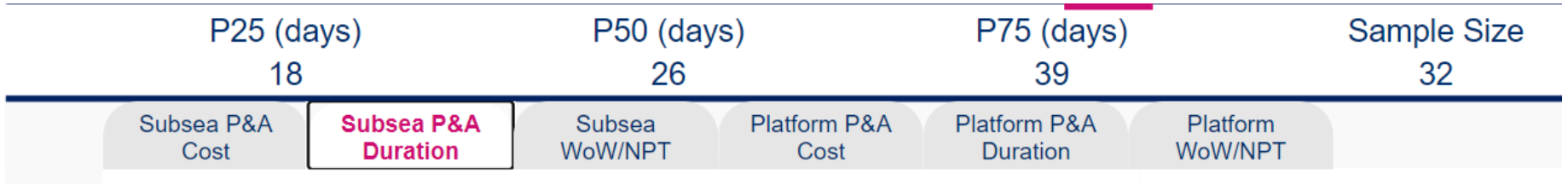


NSTA BENCHMARKING

WOW NPT



DURATION



COST

North Sea Transition Authority

PROJECT OVERVIEW

1

Single Well

Worst case for Deco

2

‘Double’ Mob

Separate Severance Mob

+

Remote Location

Transit Times

++

Tidal

NPT Risk

19.2

Days

NSTA Top Quartile
(25 days)

1.37

Client NPT

1.14 Tides
0.23 Client NPT
0% HELIX NPT

£5.9

Total Cost

NSTA Top Quartile
(£8M)

CO2 - INDEPENDENT DATA FOR A 66 DAY P&A CAMPAIGN

LWI versus a 3rd Gen moored semi with in-field moves

We all know….

- Rig requires tow and AHTV's for moves
- LWI does not
- LWI mob in port uses minimal fuel v PSV on DP on location
- No seabed survey vessel
- Helicopters similar requirements

Total LWI campaign including interim port calls is 71.3 days
Total Rig campaign including 4Kts tow and moves in field is 77.5 days

Total LWI campaign CO2 emissions	– 5990.3 Te
Total 3rd gen rig campaign CO2 emissions	–10213.7 Te

CO2 ANIMATION (IF AVAILABLE)

Thank you

Acknowledgements:

Thank you to the teams of Operators who assisted the campaigns, to the crew of the Q7000

And to ICOTA for allowing me to present today