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CUT & DROP

Well Abandonment on Wire

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SPE Aberdeen Well Decommissioning Conference

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The Vision

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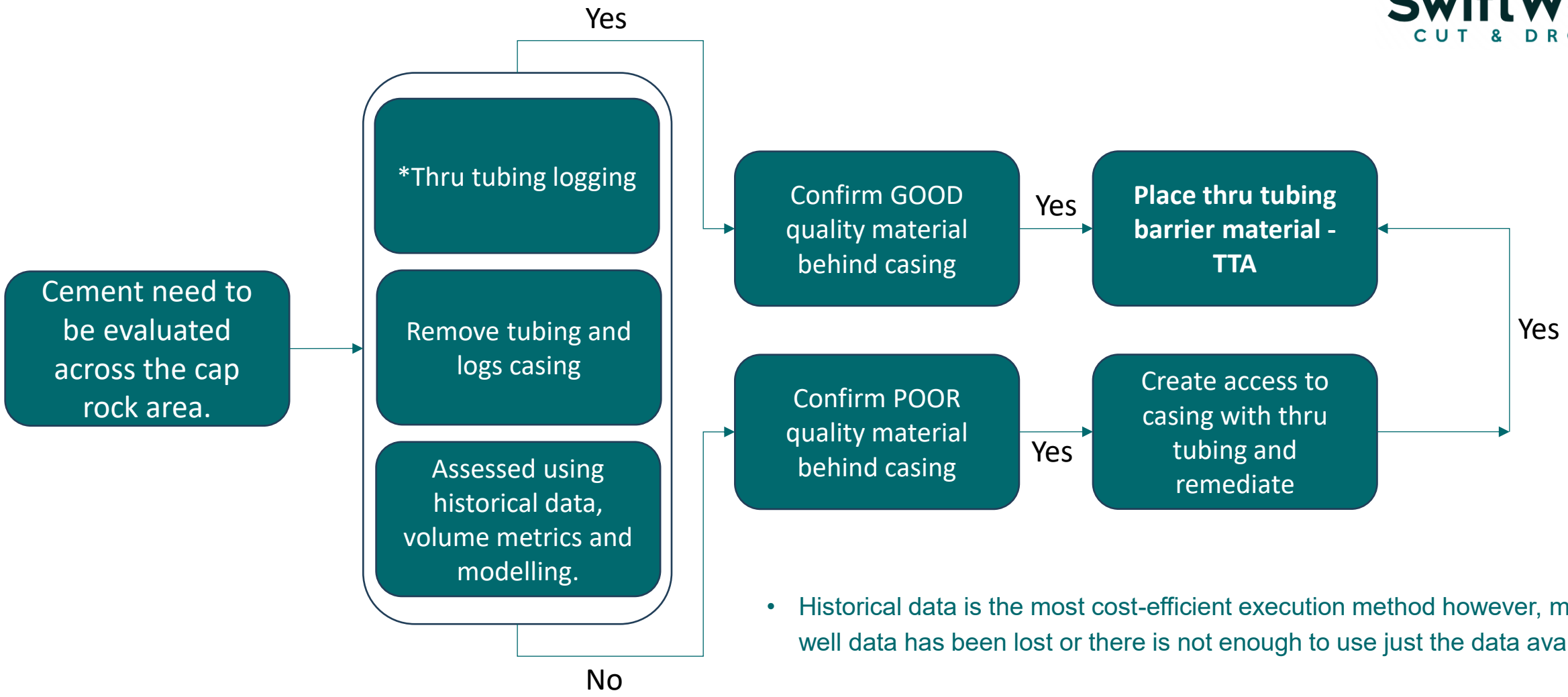
- A radical step change is required. The development of rigless abandonment methods and technologies. Rigless methods are currently being pursued, but there is no single solution: more tools in the toolbox are required.
- “P&A on a wire” using our wireline ‘Cut & Drop’ method to deliver:
  - Up to 70% cost savings for suitable wells
  - Up to 70% reduction in CO2 footprint

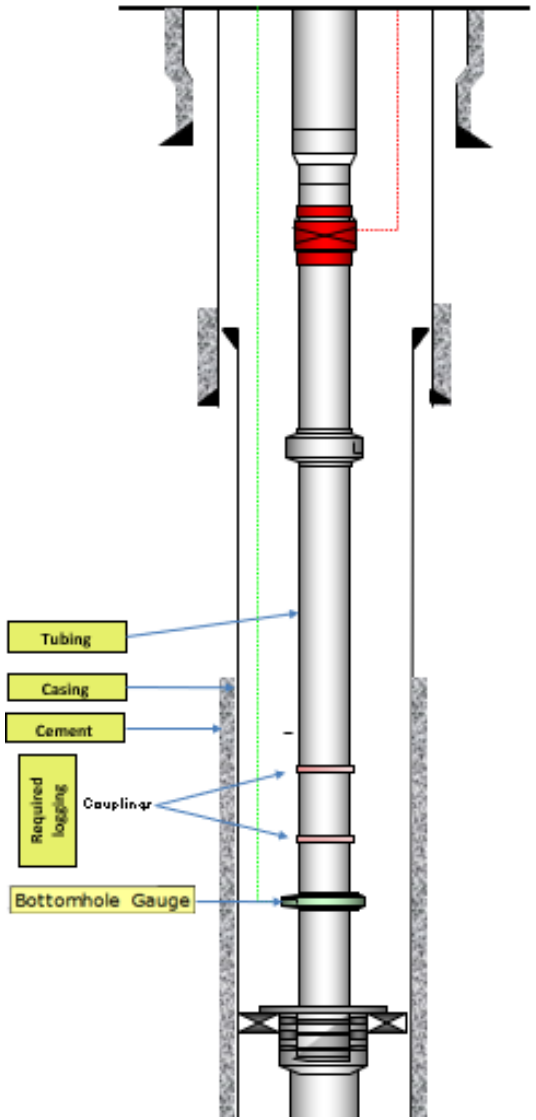
Industry Challenge



- Historical data is the most cost-efficient execution method however, most old well data has been lost or there is not enough to use just the data available.

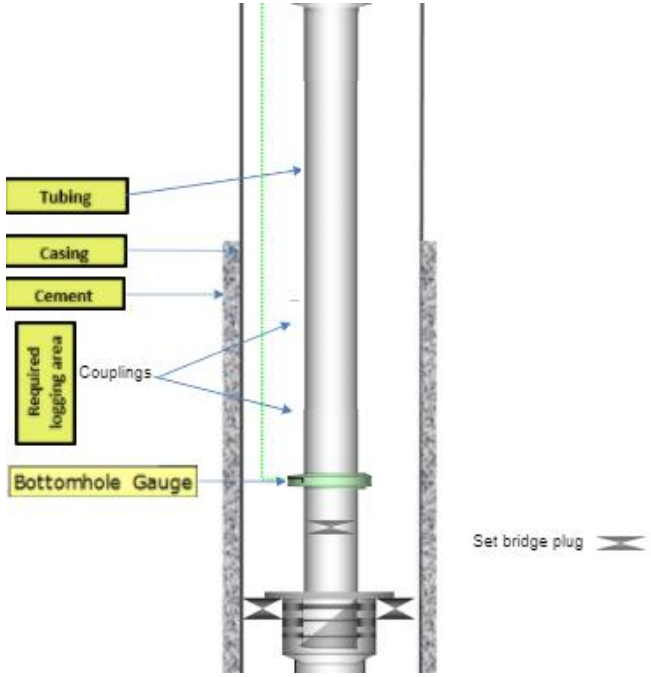
*Operator still discovering potential

Current market technology - Wellbore

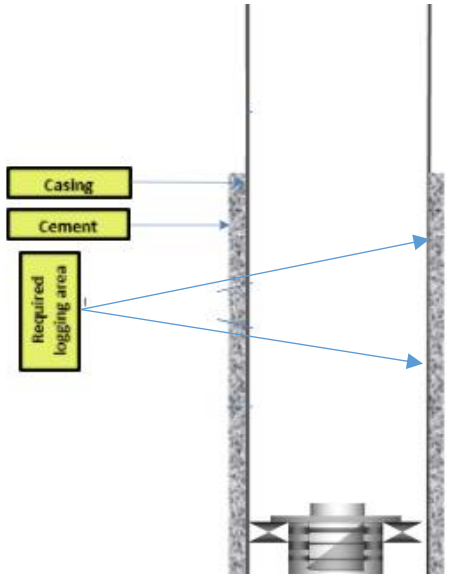


Current wellbore with questionable annular cement

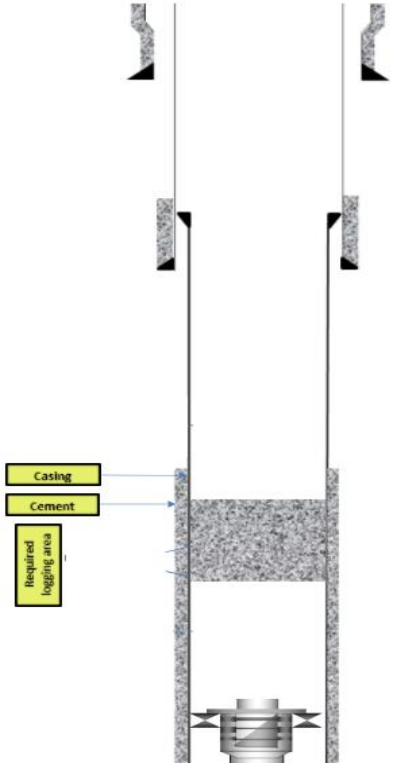
Current market technology cont.



Set bridge plug above or below Packer, punch, cut, set shallow plug



Pull production tubing and log casing



Set cased hole plug across cap rock and isolate reservoir

Proposed Solution

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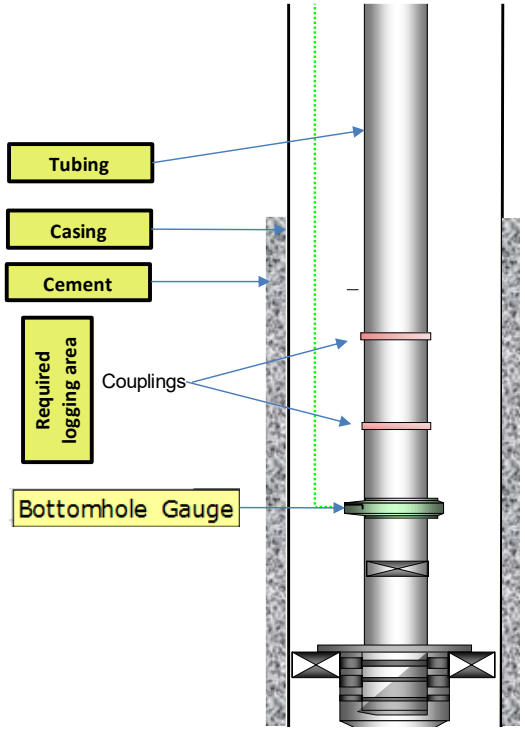
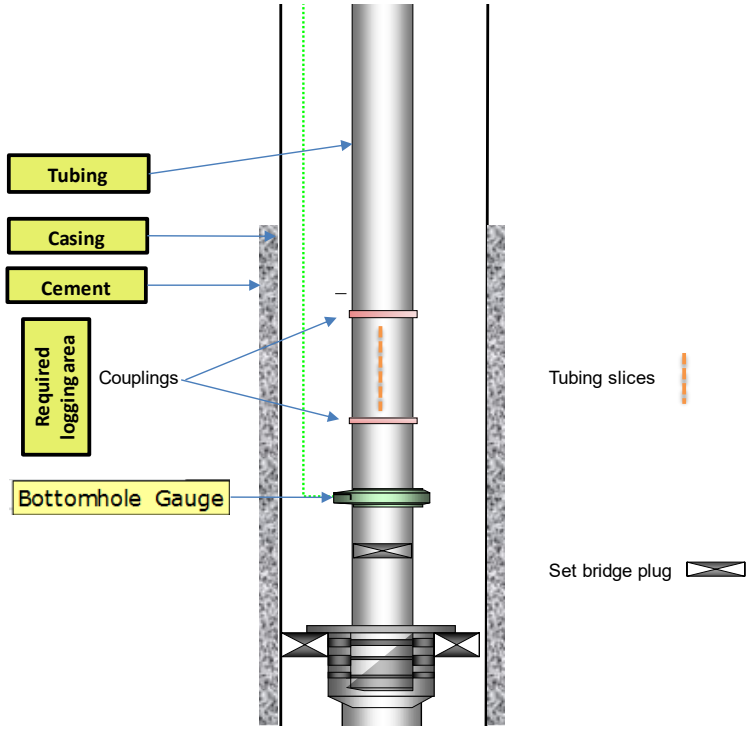
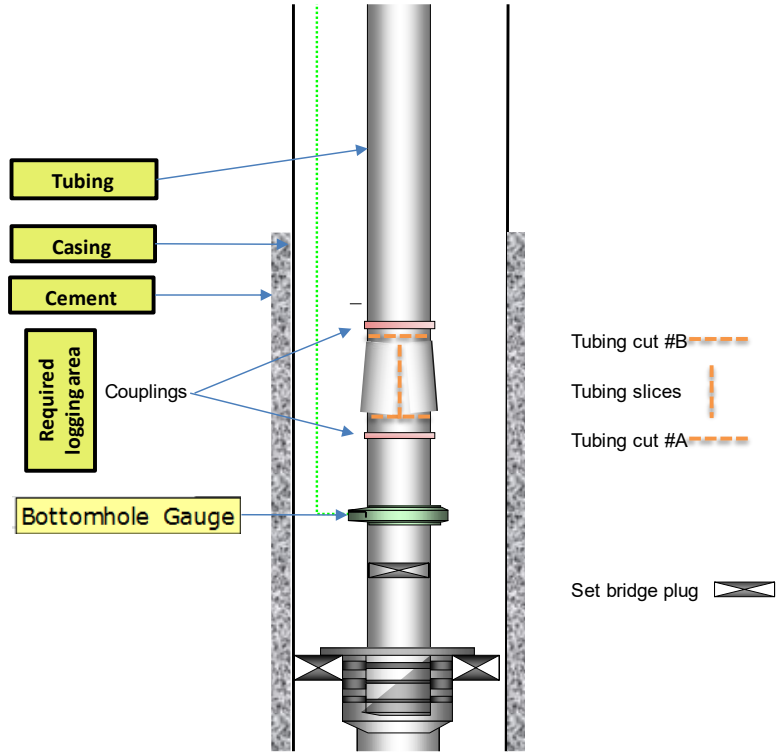


Set bridge plug above or below Packer and conduct CCL



Slice tubing vertically



Make cut #A then cut #B and locate expansion tool

Proposed Solution

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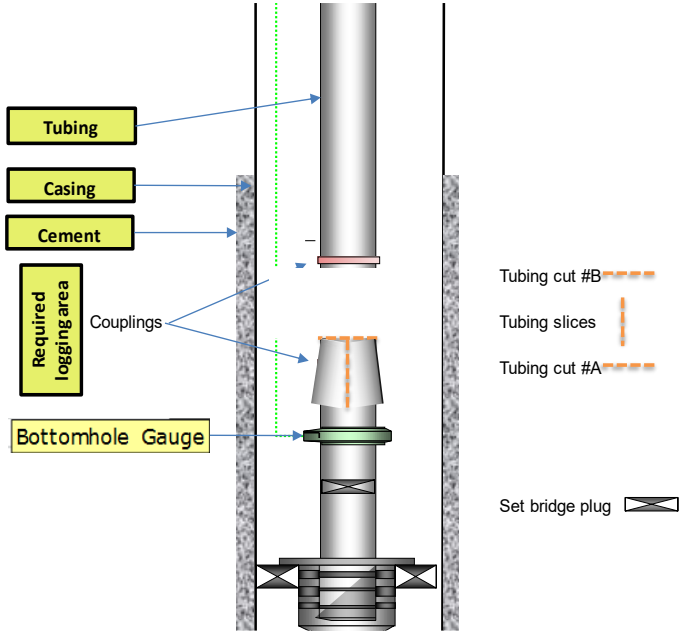
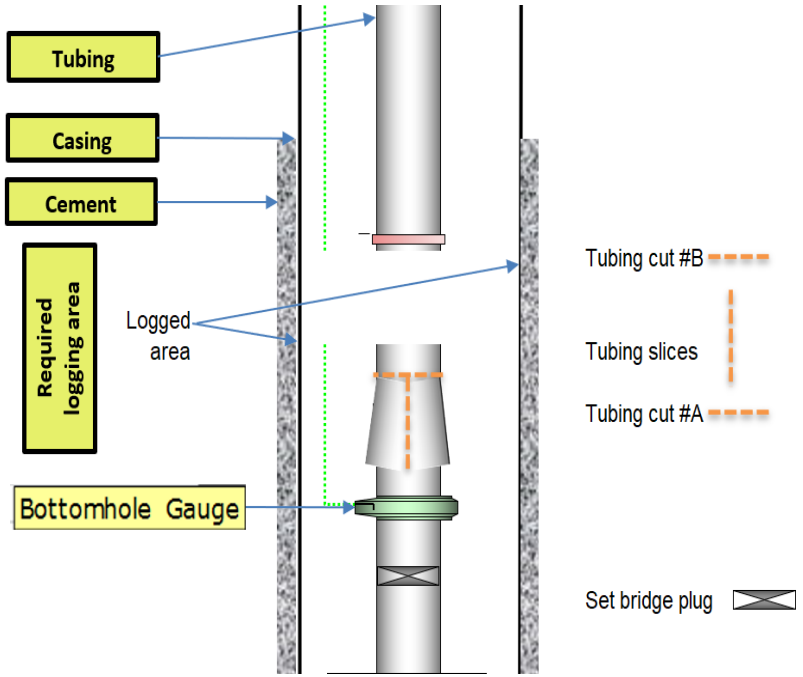
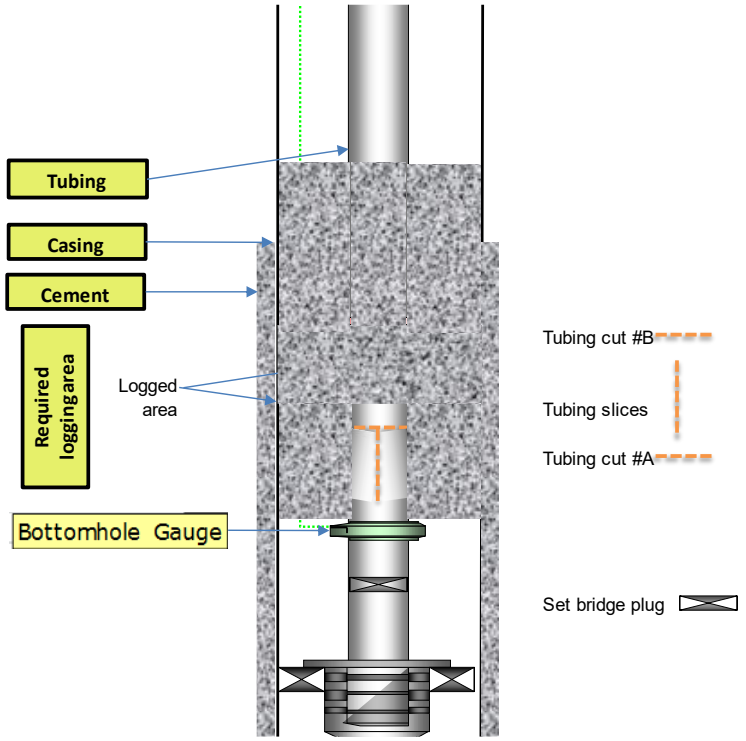


Push the tubing in to the annulus



Run logging tool and log 9-5/8" casing

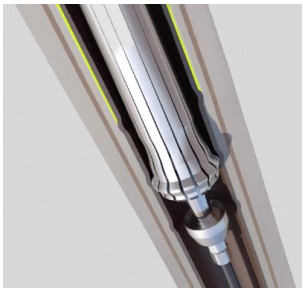
Drift casing - CL



Run Oscillator tool and pump cement

Tooling on the market

- ✓ Bridge plug and CCL
- ✓ 2 x Anchors
- ✓ Strokers ✕Length of required stroker
- ✕ Slicer tool (Designed)
- ✓ Expander tool
- = Tubing cutter, existing technology needs modified
- ✓ Drifting casing before logging
- ✓ Logging - casing



- Green – on the market
- Orange – on the market but needs modified
- Blue – required detailed design

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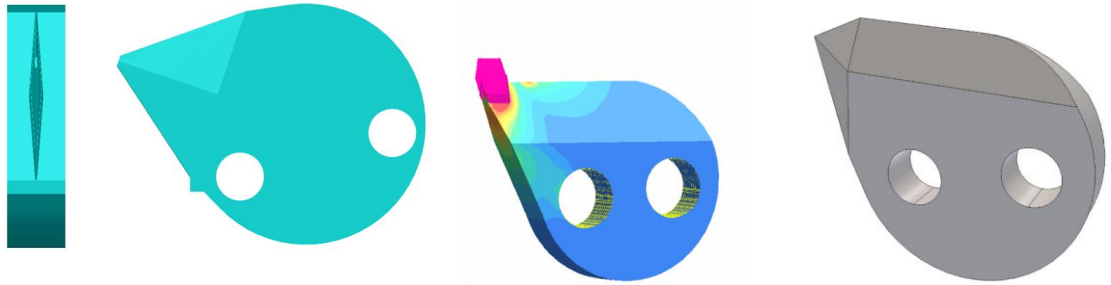
Pushing & Slicing tubing into annular section

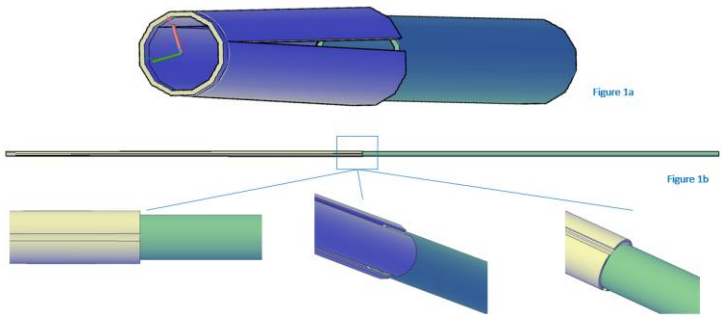
Dr Sergi Arnau
Dr Michael Olatunde

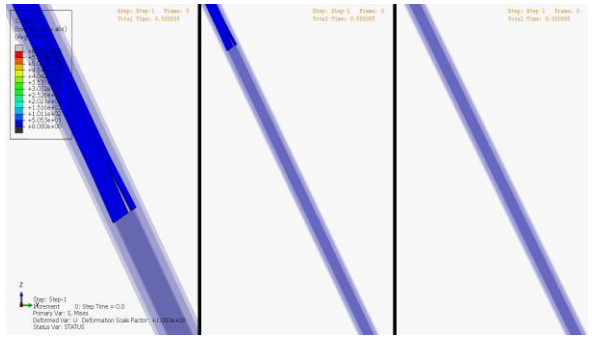
September 2025

Modelling – Blade/Push/Slice

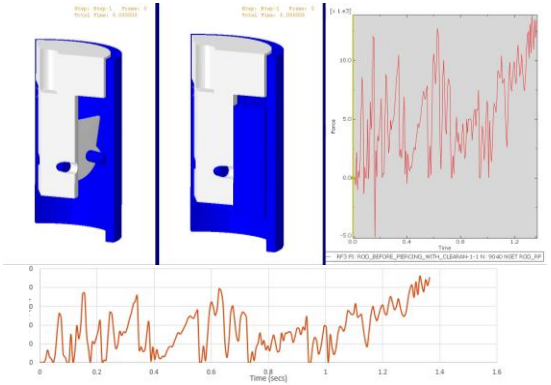


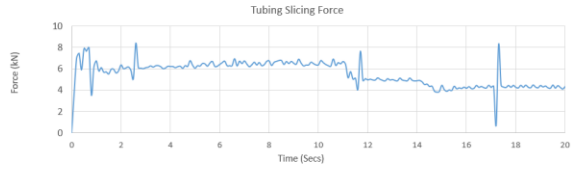
Phase 1: Several versions of blade design to optimisee the punch through & Slicing

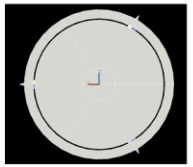




Phase 2: Freefall of sliced and cut tubing under gravity (at 60° to the horizontal)







Slicing Assembly

Maximum Slicing force = 8.42 kN (858.6 kg), Average Slicing force = 5.57 kN (567.9 kg)

Phase 3: 3 x blades average Slicing force = 1.83 kN (186.6KG) to 5.57 kN (567.9 kg) – ongoing design

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Slice tool Design

Dr Sergi Arnau
Dr Michael Olatunde

Ongoing 2026

Design Milestones

Work Package	Description	Key Deliverables	Reference (Diary / DFMEA)	Responsible	Sign-Off
MS0 – Design Basis & Interfaces	Confirm design scope, boundaries and interfaces for the Cut & Drop tool only.	- Design basis - Interfaces - Assumptions locked	Design Diary	Engineer SG	SG
MS1 – Mechanism Architecture & Dual Pivot Concept	Develop and select the preferred mechanism architecture including dual pivot pin arrangement.	- concepts - Selected architecture - Load paths - Hard stops	Design Diary + DFMEA	Engineer MO	
MS2 – Pivot, Pin & Anti-Galling Strategy	Define pivot system including pin layout, bearing strategy, material pairing and serviceability.	- Pivot stack-up - Material pairing - Anti-galling approach - Service concept	Design Diary + DFMEA	Engineer MO	
MS3 – Punching Position Definition	Define controlled punching position including geometry, stops and load transfer.	- Punch position geometry - Hard stops - Load path justification	Design Diary + DFMEA	Engineer MO	
MS4 – Slicing Position & Landing Interface	Develop stable slicing position and mandrel landing interface for controlled load transfer.	- Landing geometry - Slicing angle definition - Stress mitigation	Design Diary + DFMEA	Engineer MO	
MS5 – Multi-Station Packaging (3 Cuts)	Confirm packaging of three cut positions including spacing and interference.	- 3-position layout - Interference check - Assembly concept	Design Diary + DFMEA	Engineer MO	
MS6 – Model Package & Manufacturing Drawings	Deliver prototype-ready CAD model package and drawings.	- 3D models - GA drawings - Part drawings - BOM	Design Diary + DFMEA	Engineer MO	
MS7 – Design Freeze & Prototype Release – APRIL 2026	Formal design freeze to enable prototype manufacture.	- Final review - Design freeze record - Prototype release approval	Design Diary + DFMEA	Project Team GM/SG/MO	

Current Status and forward plan

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- The patent has been submitted and published
- Funding secured from the NZTC to build and test the prototype slicing tool.
- Base plan is to develop function slicing tool by Q2/Q3 2026
- Testing of the slicing tool could potentially be conducted at the NDC
- Conduct interface/clash modelling by the end of Q3 2026
- Looking for collaboration partner

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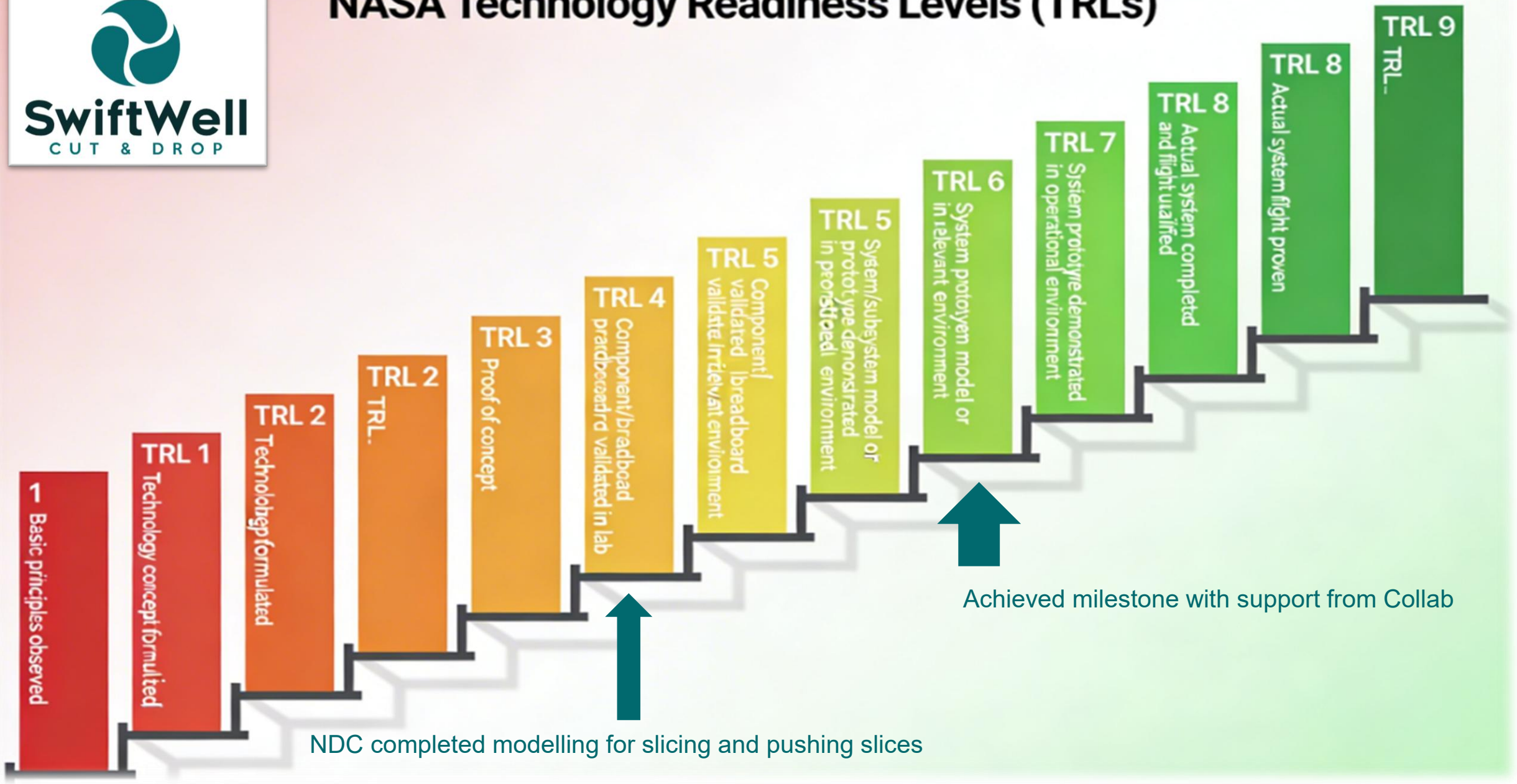
NASA Technology Readiness Levels (TRLs)



Achieved milestone with support from Collab

NDC completed modelling for slicing and pushing slices

Punching and Slicing

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Questions?

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