



Equinor P&A Outlook

Ha vtil P&A Fagdag

Stein Åtland

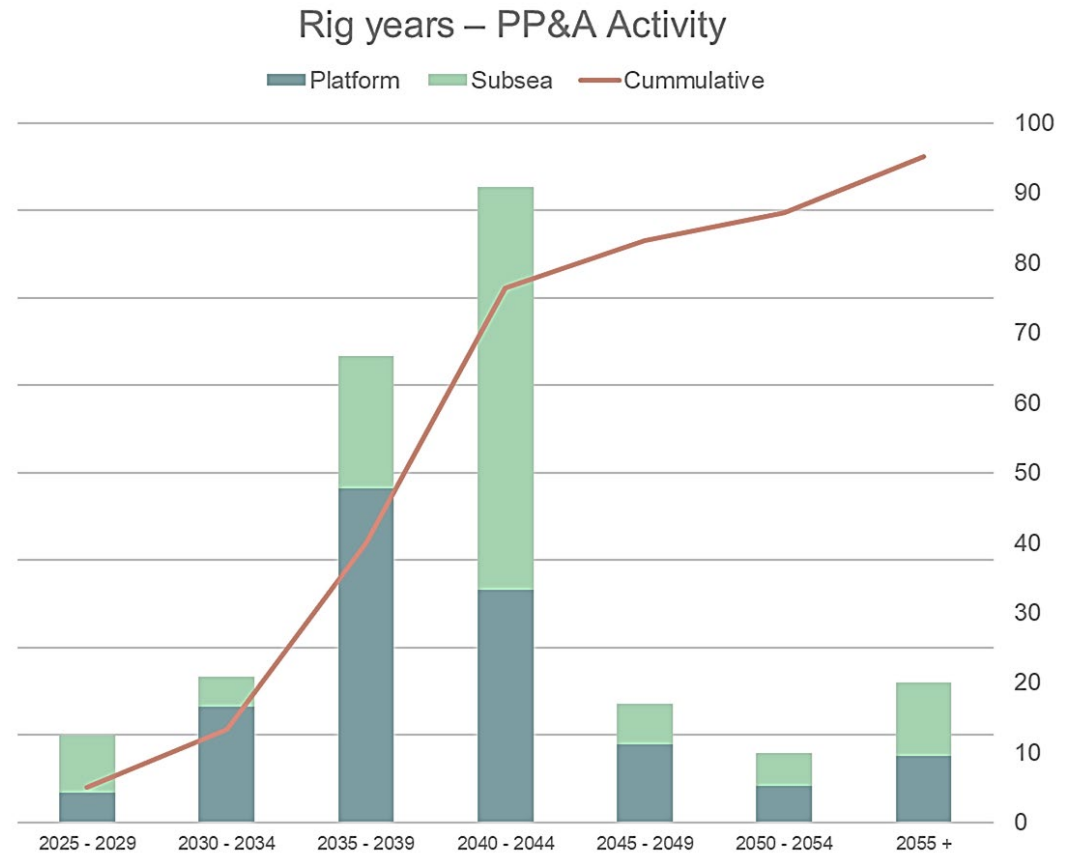
Leading advisor Well integrity – P&A



Background

- 1519 wells with P&A liability
- Up to 2030, the plan is to permanently plug about 80 subsea wells using mobile rigs, and 90 platform wells.
- 45 slot recoveries per year
- Close to 50/50 split between subsea and platform wells
- Huge potential for new cost-reducing technology and methods

Amount of P&A work vs Current cease of production estimates





Industrializing P&A on NCS

- Framework agreements for plugging services
- Dedicated semi-submersible rig for subsea wells
 - 15–20 wells will be permanently plugged each year
 - Nine different fields, including Heidrun, Snorre and Norne





P&A Business Needs

Design Basis

Fit-for-purpose PP&A strategy

- Overburden Analysis
 - Data gaps
 - Data integration
 - Dynamics
 - Evaluating flow potential of flow zones
- Legacy wells and old sidetracks data
 - Data retrieval and availability
 - Data integration

Design

Simplify P&A through a fit-for-purpose P&A design

- Well barriers status
 - Barrier verification through tubing
 - Data integration
- Define fit-for-purpose well barriers
- Opportunities
 - Expanding use of formation as barrier
 - Offline operations
 - New P&A methods

Execution

Efficient and low-cost execution of P&A operations

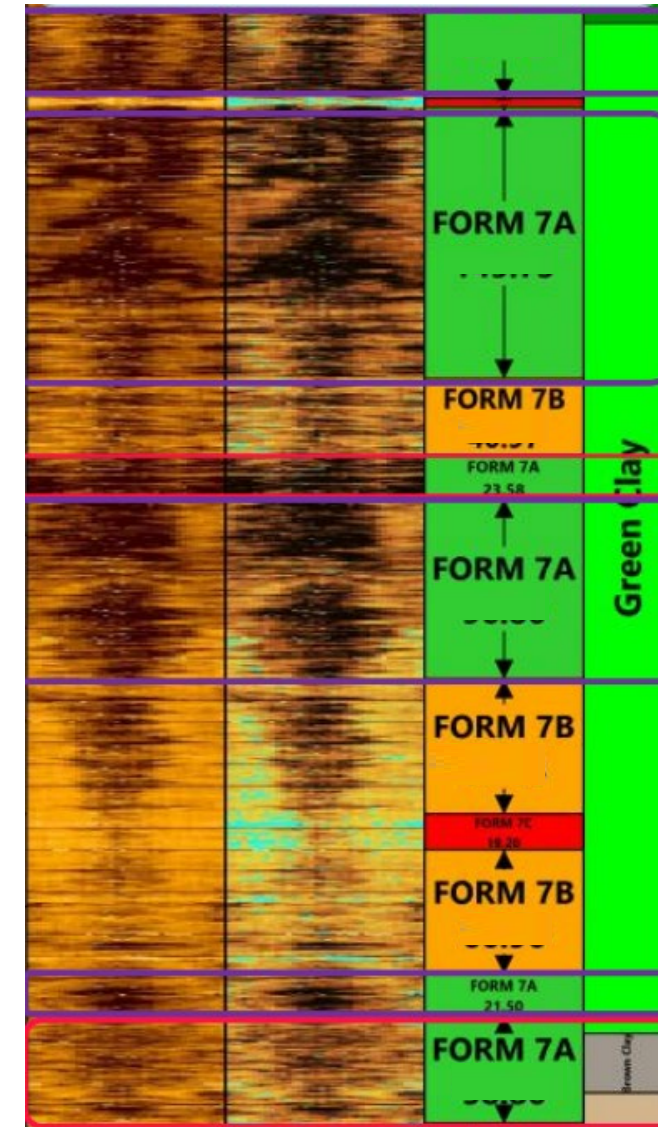
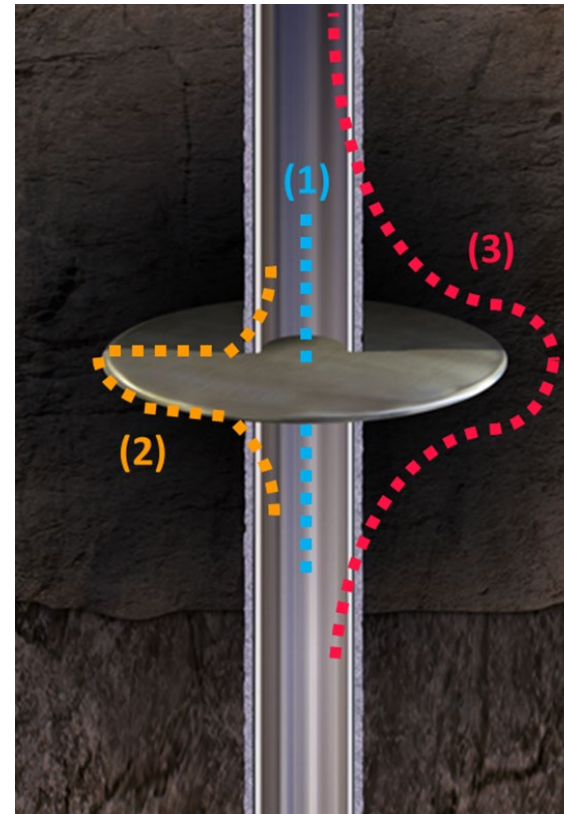
- Barrier placement and verification
- Re-establish insufficient cement barriers
- Efficient removal of casing



Barrier capacity project

Background:

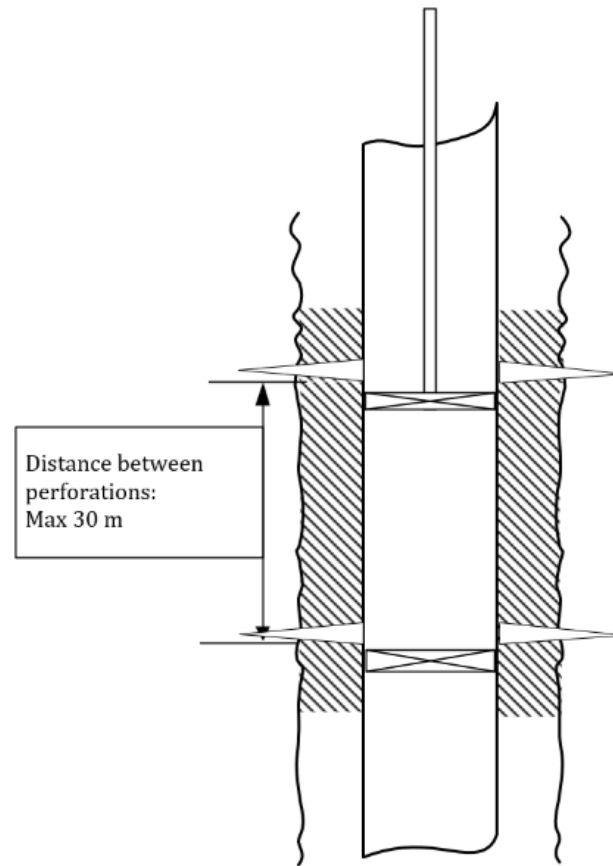
- P&A and Slot Recovery cost.
- Well Construction
- CCS/Legacy wells
- Assessment of shorter barrier intervals
- New P&A solutions
- Potential accumulation of shorter intervals
- Representative field conditions not available in lab.



- What's the barrier capacity of a short length of annulus cement or formation creep?

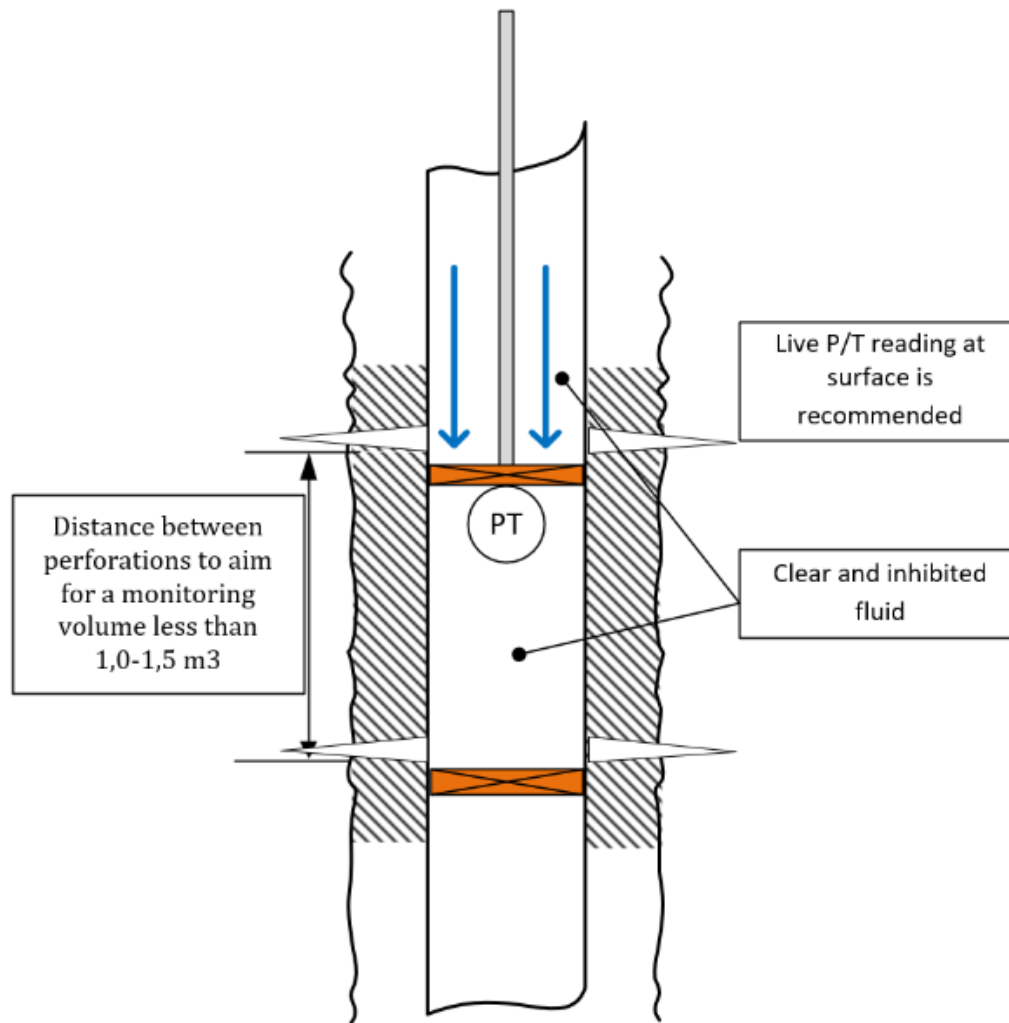


Standard communication test



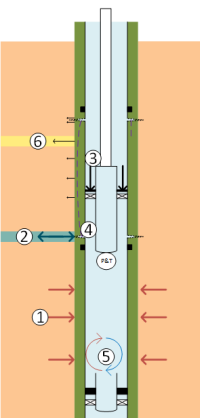


How do Equinor perform a communication test



Factors affecting results

1. Heat transfer from formation to monitoring volume.
2. Formation hydraulic interaction.
3. Pressurizing plug – compression of monitoring volume.
4. Clay swelling / shrinking
5. Temperature convection within monitoring volume
6. Horizontal fluid loss along test interval

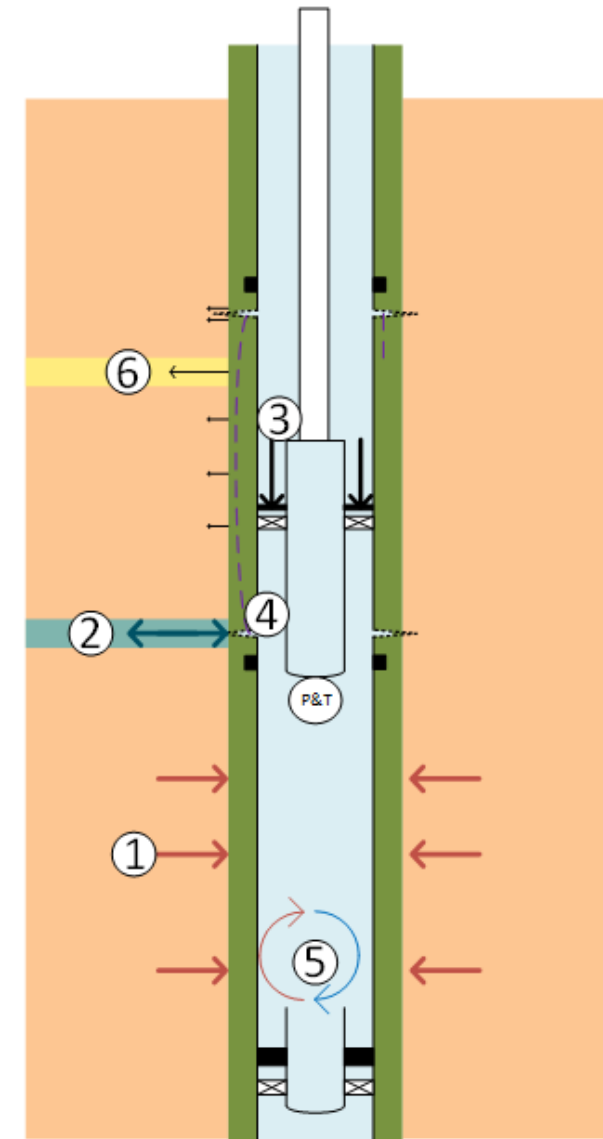




How do Equinor perform a communication test

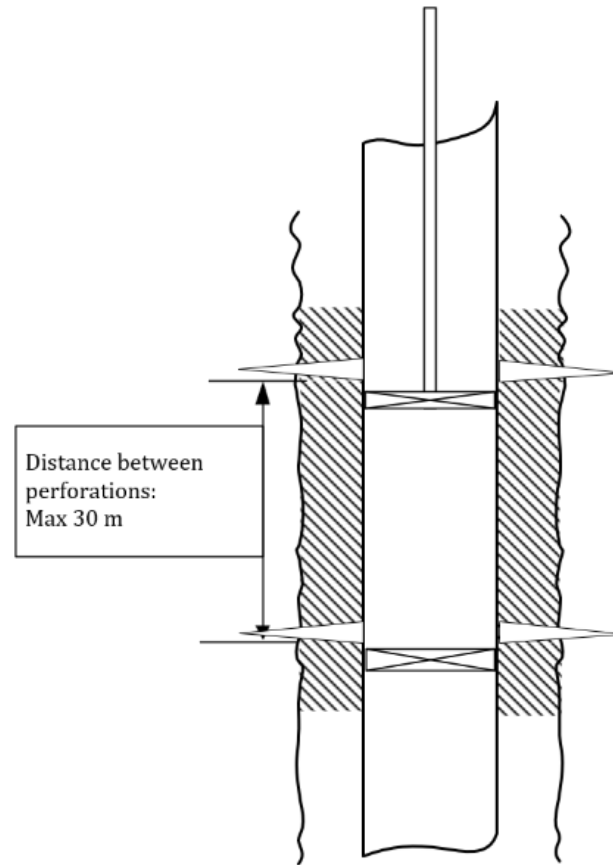
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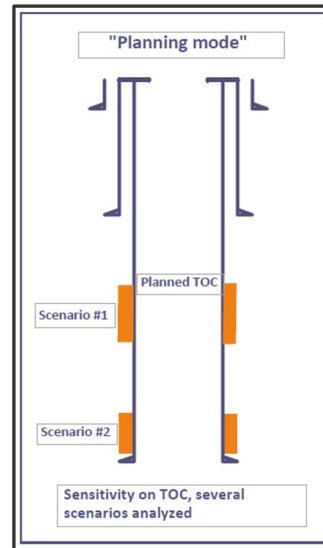
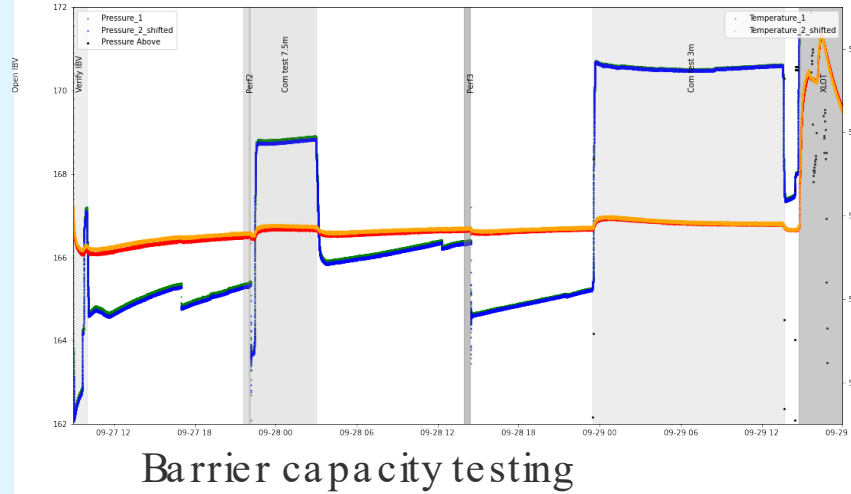
Hearing version of Norsok D-010 rev.6



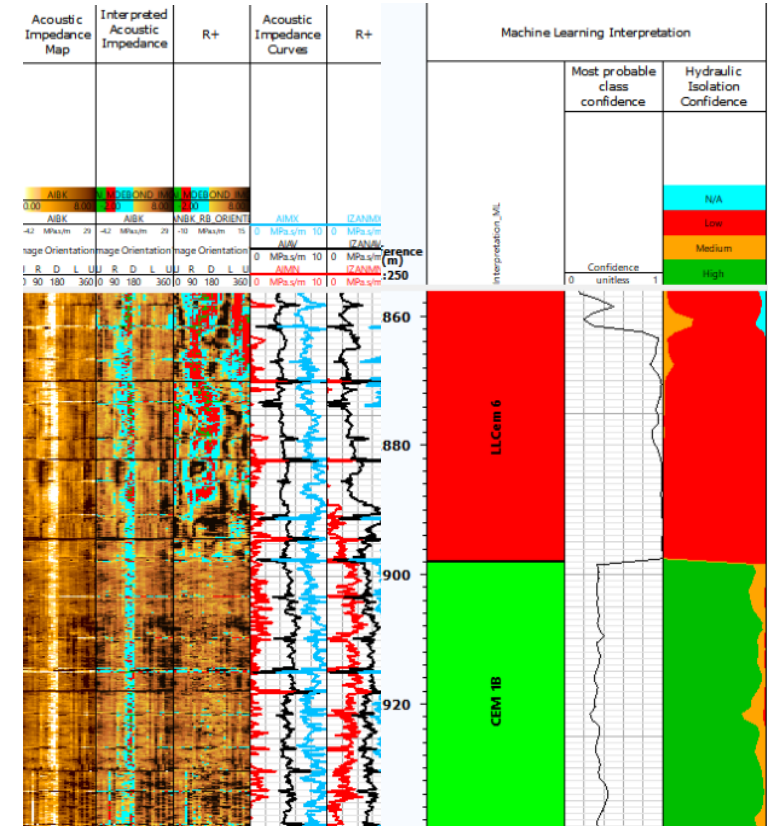


Knowledge based P&A

- Testing on representative barriers
 - Cement
 - Formation
 - Different log categories
- Well integrity analysis
- Combined with all other relevant data (well history, cement job, formation logs, etc)



SimeoWellCem- Well Integrity Support (SPE17761)2



Assisted cement log interpretation tool (SPE/IADC March 2023)



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