

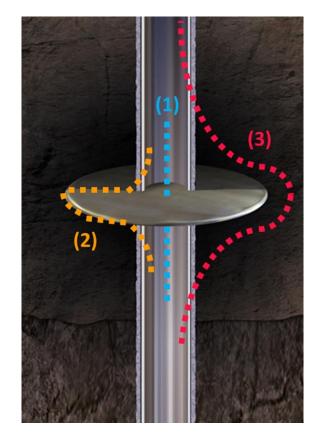
Short formation lengths as part of annulus barrier – test results and experiences

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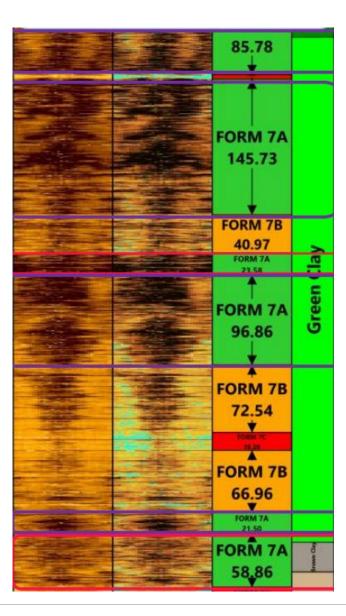


WHY?

- P&A and Slot Recovery cost.
- Assessment of shorter barrier intervals
- New P&A solutions
- Potensial accumulation of shorter intervals
- Representative field conditions not avaliable in lab.



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





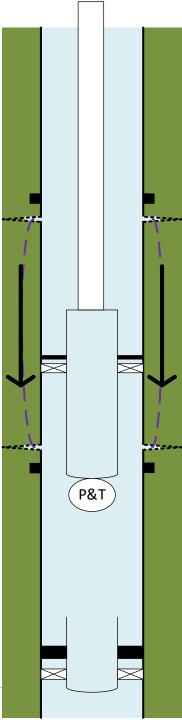
How to measure the barrier quality?

- Multiple testing methods and tools avaliable today.
- Although properties of both cement and crept formation can be measured in lab, validation towards insitu conditions is important.

Successfactor: Sensitivity

The communication test

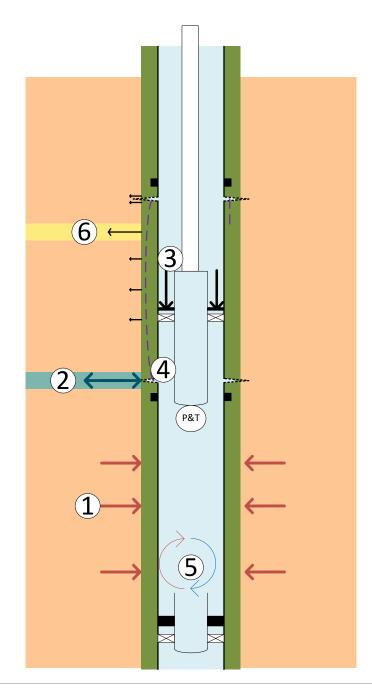
- Conveyance: DP or Wireline
- Sequence: lower plug, lower perf, upper plug, upper perf (combination runs available)
- Differential pressure applied from above, monitoring below plug.





Setup and factors affecting results

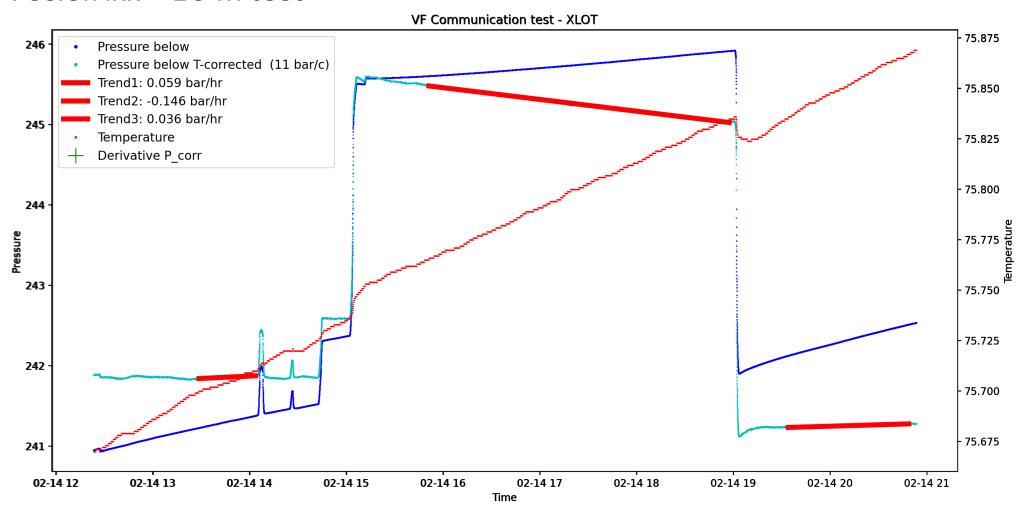
- 1. Heat transfer from formation to monitoring volume.
- 2. Formation hydraulic interaction.
- 3. Pressurizing plug compression of monitoring volume.
- 4. Clay swelling / shrinking
- 5. Temperature convection within monitoring volume
- 6. Horizontal fluid loss along test interval



4 | Open



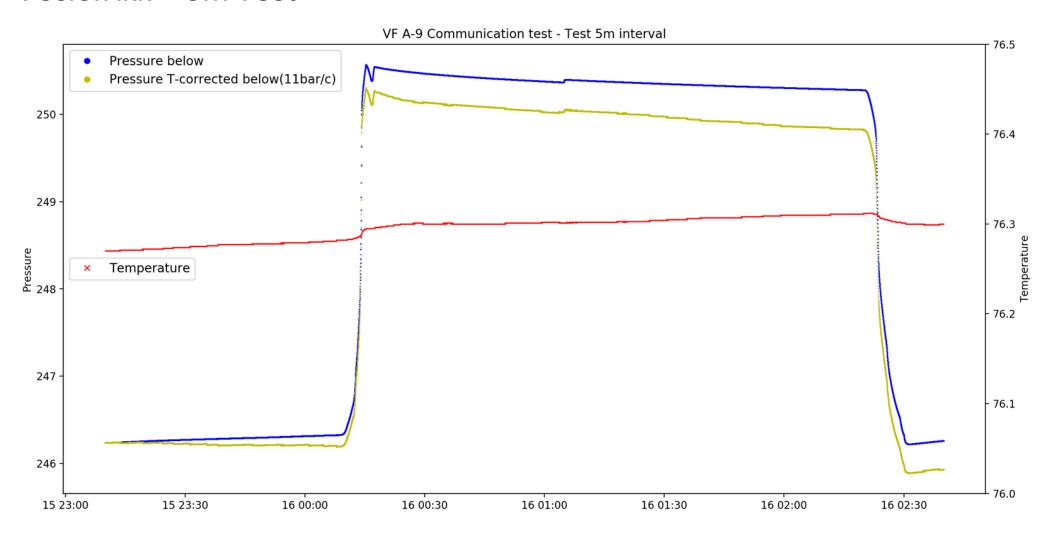
Veslefrikk – 10 m test



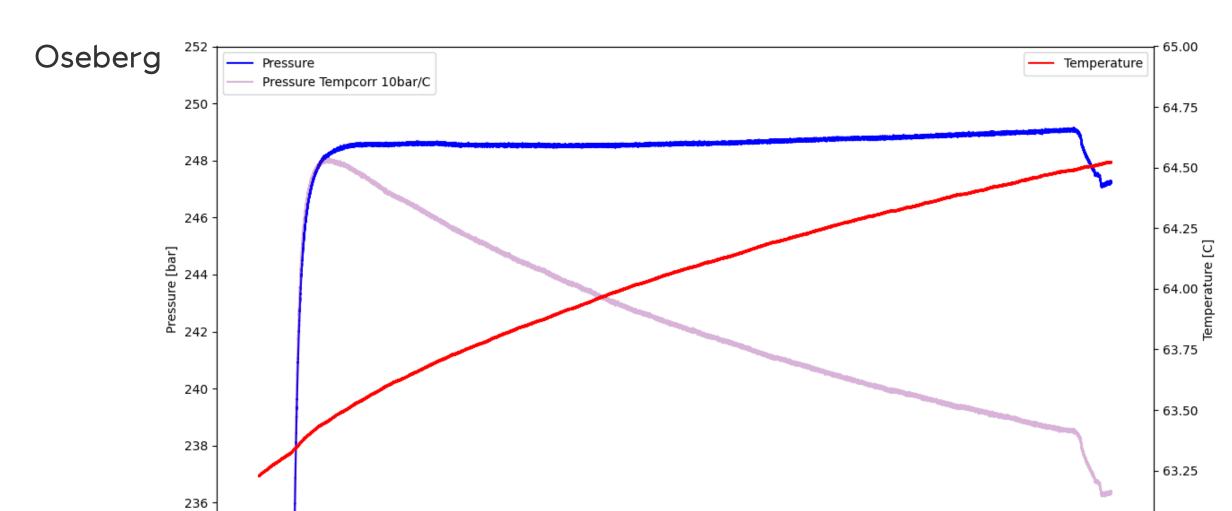
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Veslefrikk – 5m Test







12-11 14

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12-11 10

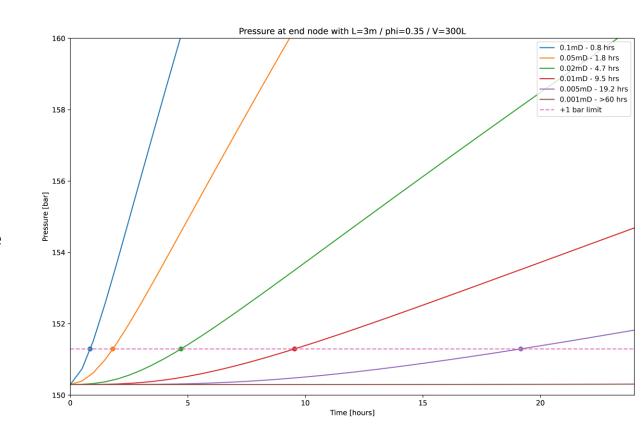
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Where are we now!

- No leak along annulus is proven in the cases analyzed.
- Shortening the test length is still favorable for data collection.
- Formation interaction is larger than anticipated.
- Simulation models assist in showing what cases are feasible to detect.
- In order to improve data collection and data sharing is required.



• Thanks for **Veslefrikk** partners (Petoro, Repsol, Wintershall Dea and Equinor) and **Oseberg** partnership (Petoro, TotalEnergies, ConocoPhilips and Equinor) for allowing to share test data.

8 | Open



QUESTIONS?

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Short lengths with formation as annulus barrier – test results and experiences

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