

Plug & Abandonment Forum (PAF)



Norsk olje & gass

Possible to increase rigless P&A scope ?

PAF Seminar 19 October 2016

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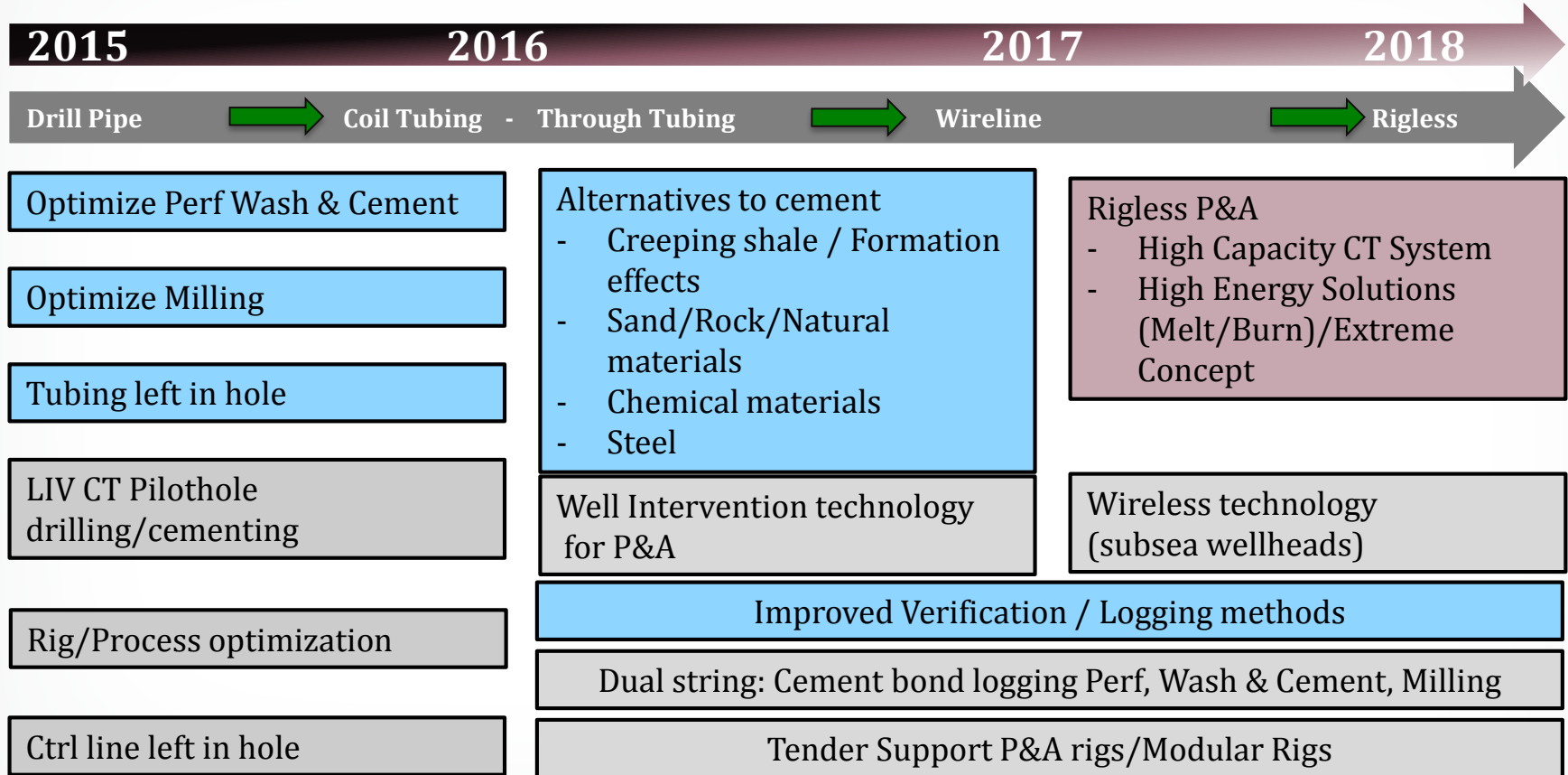
Topics

- 1. Desired P&A direction**
- 2. Technology Roadmap 2015 from PAF
- Recap of 2015 message**
- 3. Can we increase Rigless P&A scope ?**
- 4. Summary**

Desired Direction of P&A scope

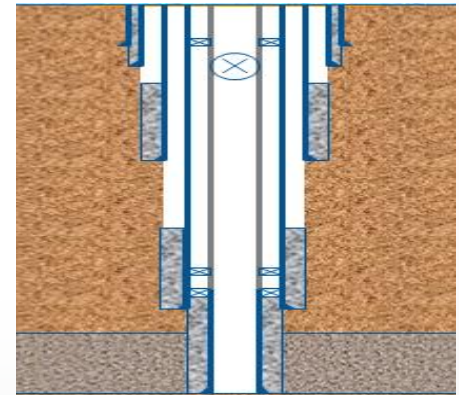
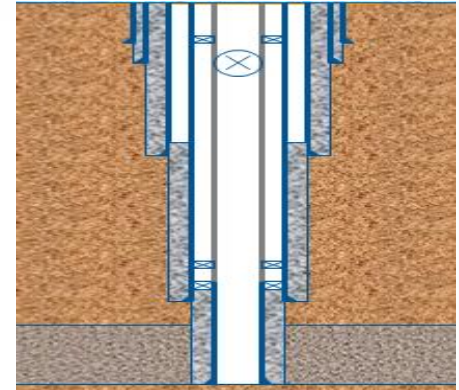
- **Move scope from rig based P&A to rigless P&A**
- **Why - Costs of course**
- **Rig costs are between 40-50% of P&A costs**

Roadmap for New P&A Technologies



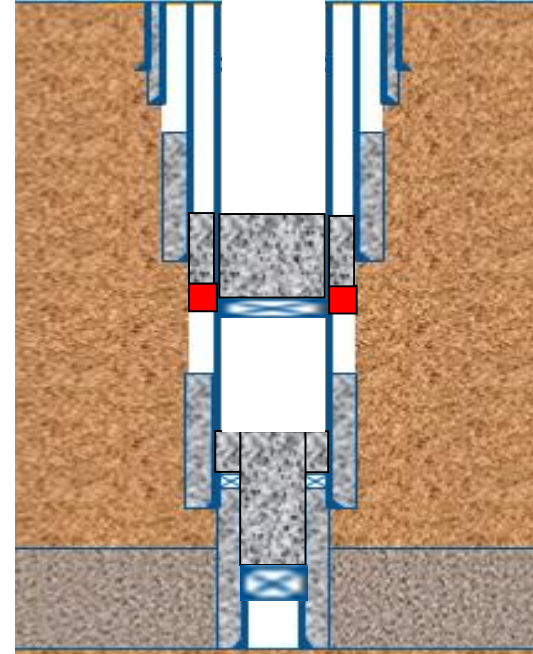
Recap of 2015 message

- Early days – cemented entire annulli. Set inside barriers.
- Well design changed. Deeper, longer, horizontal,
- **Advice:** Think "Cradle - to - Grave" when constructing new wells
- Know overburden and include P&A barrier schematics in drilling program
- **New wells:** Aim for P&A to become installation of internal barriers



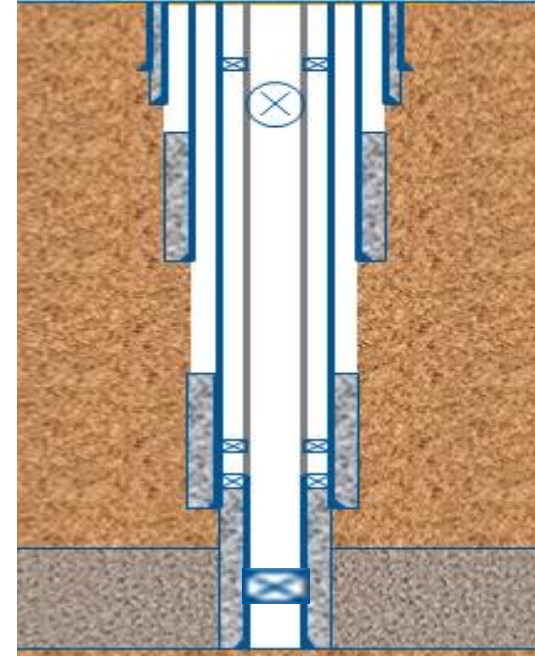
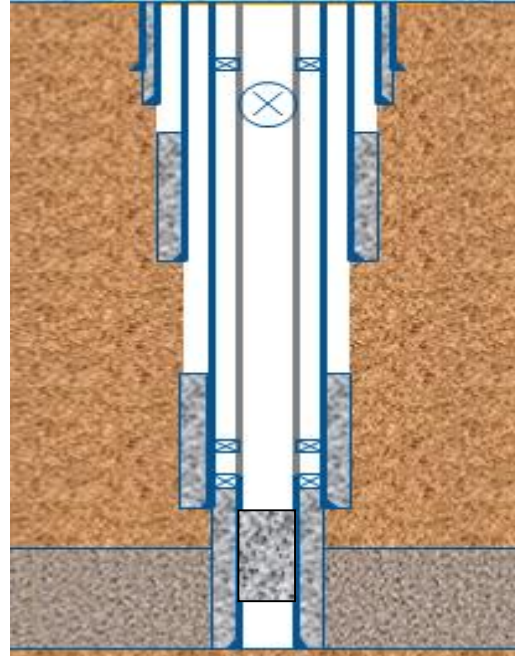
Could more P&A in the future be Rigless P&A ?

- Could we delay rig scope for P&A to the 13 3/8" shoe ??
- With wireline, coiled tubing & bullheading, we can log, set bridge plugs, set cement plugs, etc..
- Rigless P&A gives flexibility in timing for P&A



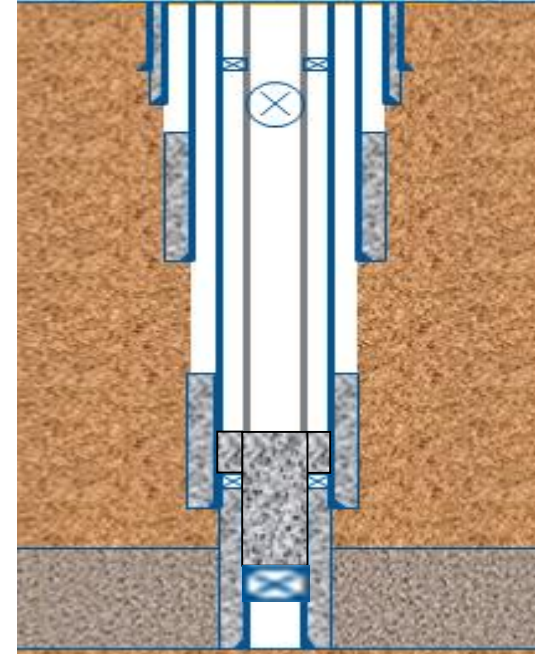
Example: Possible platform rigless P&A

- Bullhead cement, or
-
- Set wireline plug
- If we only could log through 2 strings.....



Example: Possible platform rigless P&A

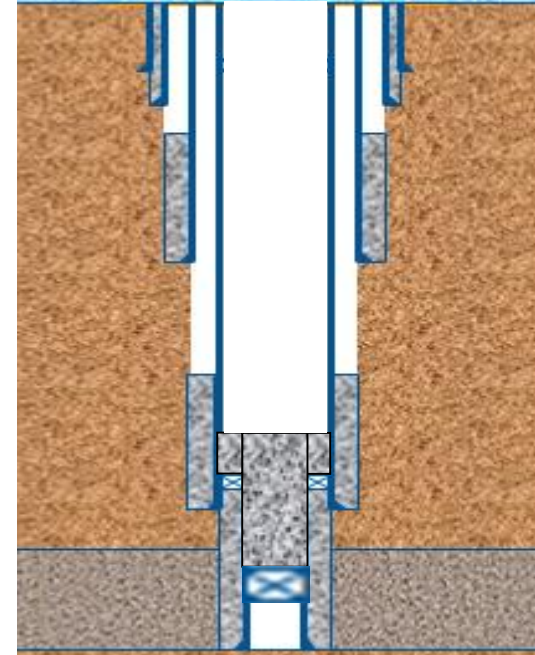
- Set cement plug with coil tubing and ensure A-annulus is dead.



Example: Possible platform rigless P&A

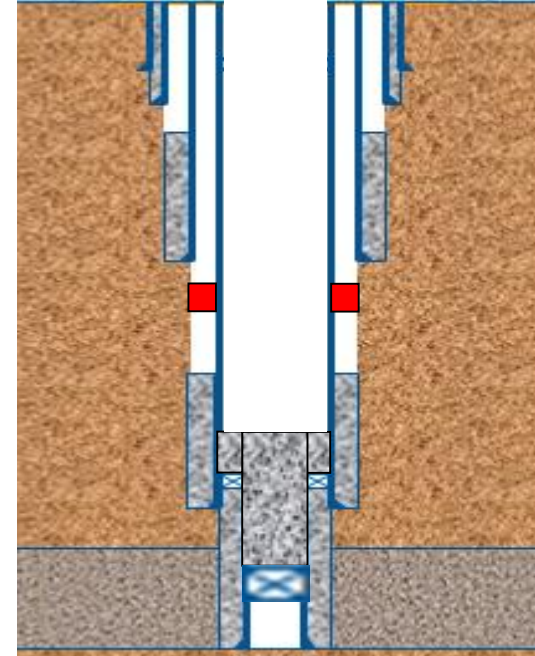
Cut & Pull tubing (w/riser and BOP):

- Wireline
- Coil Tubing
- Jacking Tower
- Can log now
 - Shale barrier ?



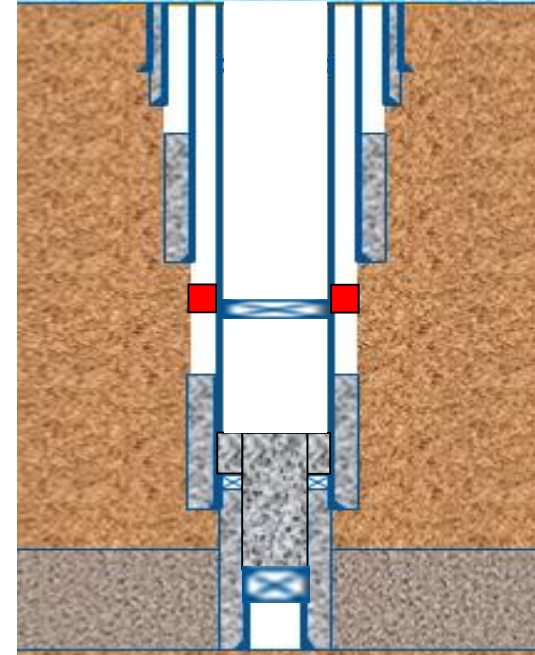
Example: Possible platform rigless P&A

- Set annular foundation in B-annulus



Example: Possible platform rigless P&A

- Set internal foundation



Example: Possible platform rigless P&A

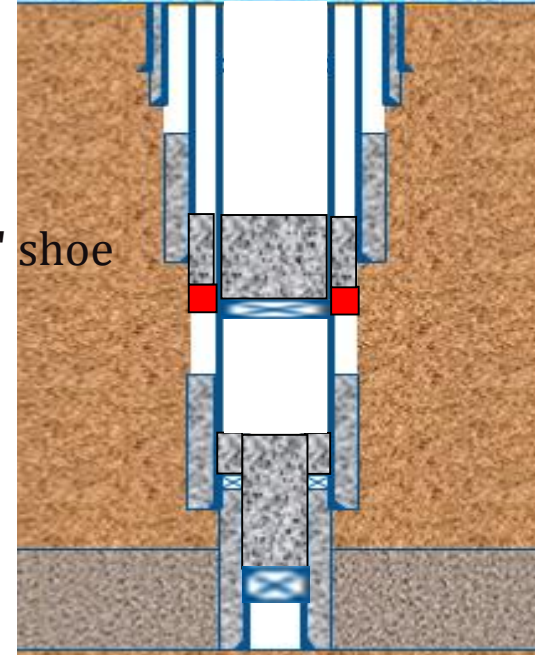
Perforate on wireline

- Bullhead a balanced cement plug or set with CT - (3 ½" CT maybe ?)

NOTE: It is all a cost issue. A platform rig is often ½ price of a jackup. Wireline also costs. If NO rig available, this is an option.

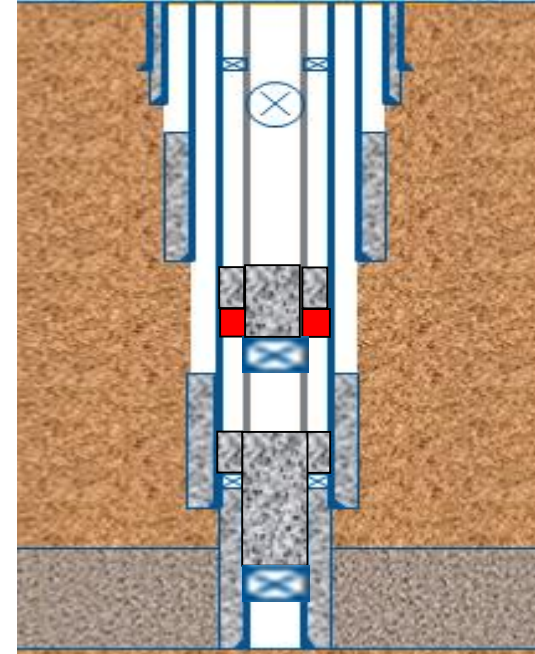
ALSO: Subsea and circulate annulus is a obstacle.

13 3/8" shoe



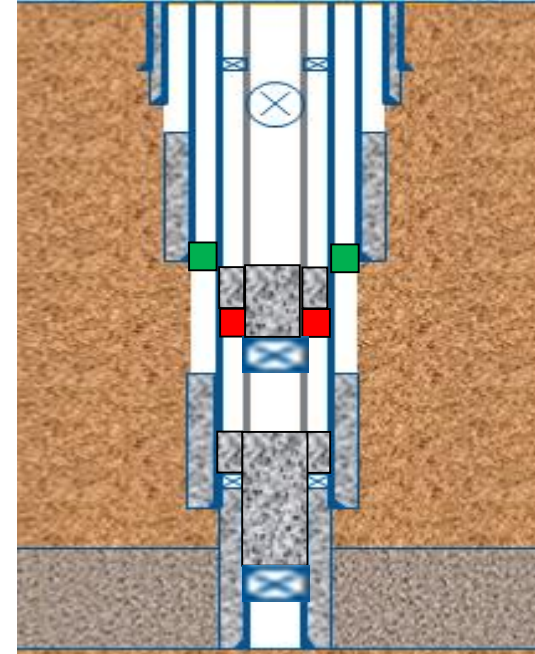
Example: w/o pulling tubing ?

- Repeat previous slides, but now in A-ann & Tubing
- NOTE: Rigless P&A has well control equipm. in place (w/tbg in place)



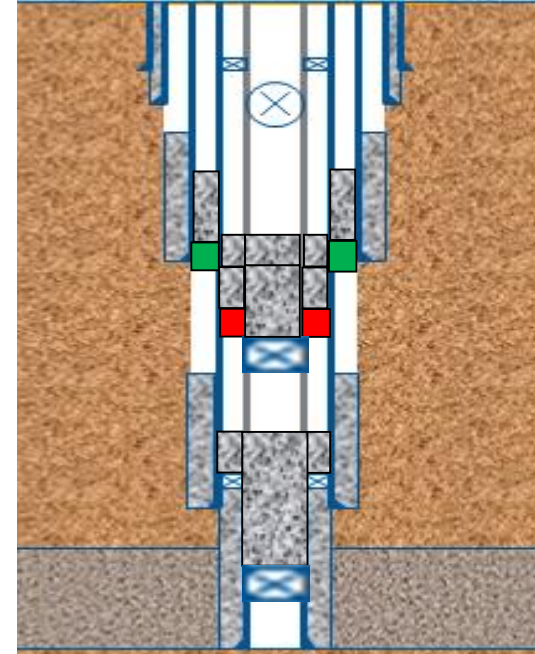
Example: w/o pulling tubing ?

- Perforate and set annular foundation in B- annulus – possible?
 - While shut in A-annulus



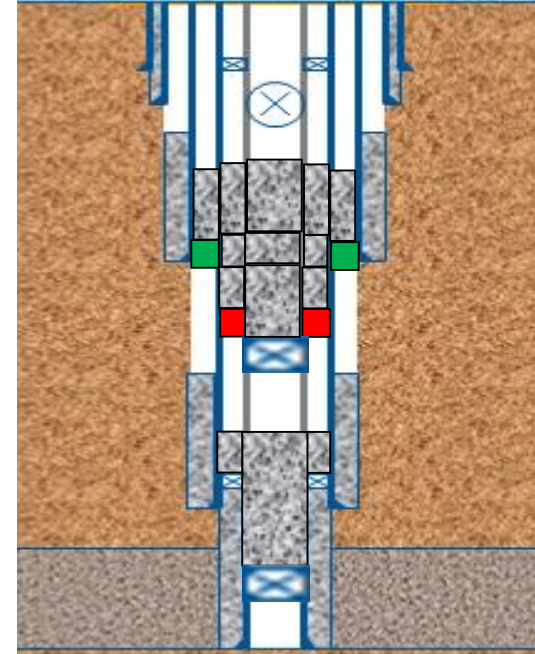
Example: w/o pulling tubing ?

- Cement B – annulus
 - While shut in A-annulus



Example: w/o pulling tubing ?

- Perforate and cement A-annulus & Tubing



Summary

- 1. It is possible to increase rigless P&A scope, even today.**
- 2. P&A needs more new technology to place quality barriers at reduced time and cost. Win - win for the industry and the nation.**
- 3. Make use of mother earth if possible (shale swelling). Best long term tested barrier ever.**
- 4. Key missing technology is logging through 2 strings. Verification of external barriers.**
- 5. Potential to leave tubing in the hole. Work on control line issue.**
- 6. Is 3 ½" coiled tubing impossible? Gives great circulation rates.**
- 7. Rigless P&A through X-mas tree keeps well control equipment in place.**
- 8. Cradle to Grave well design.
Design new wells to let P&A become setting internal barriers in the future.**