Hod A P&A

Experience transfer from Aker BP at PAF October 24th 2024

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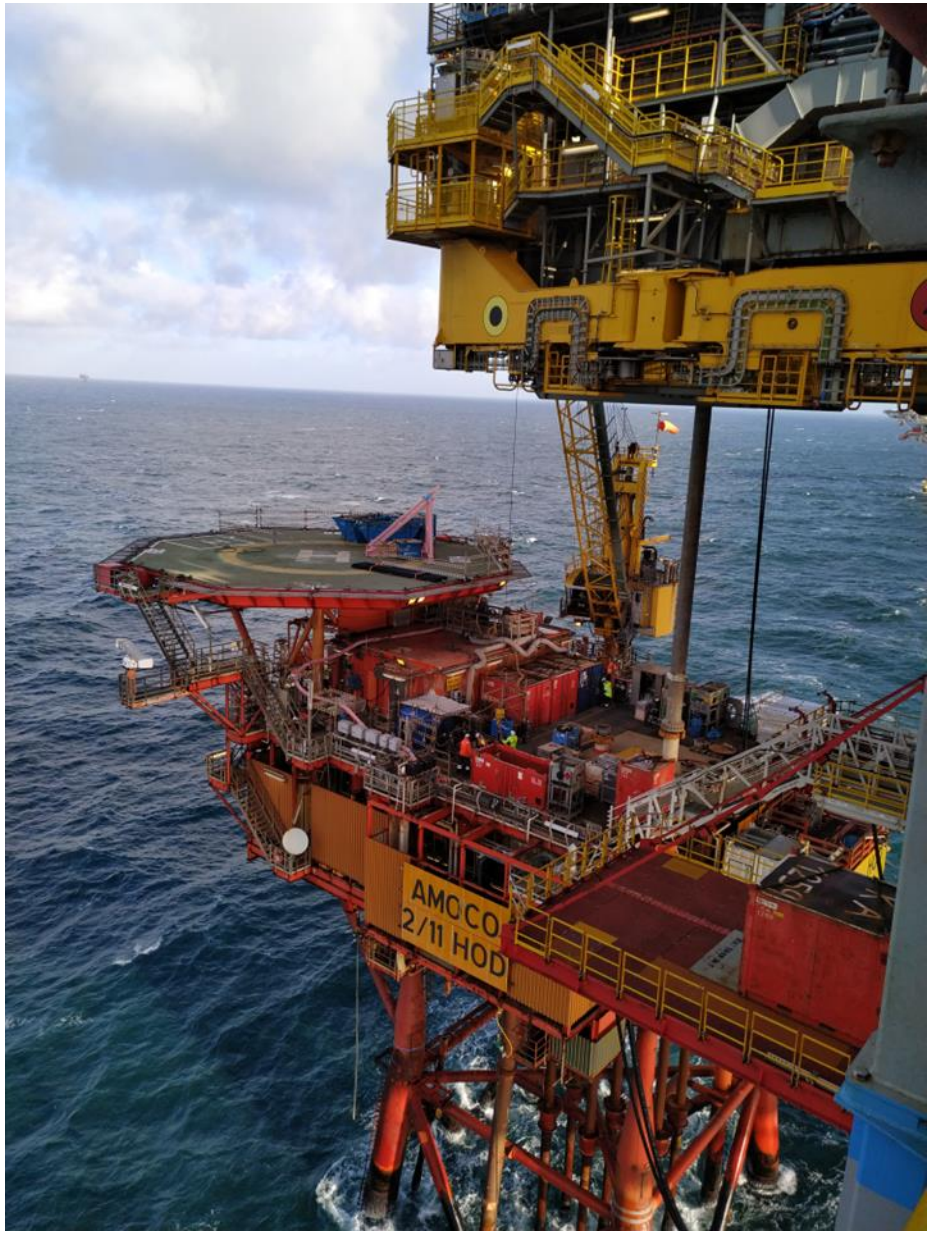
HOD A P&A

Topics:

- Hod A information
- Challenges
- Surprises
- Milling
- Conductor annulus
- Sandwich joints
- Bismuth
- New technology used
- Close out



Hod A

- The Hod Field was discovered in 1974 by Amoco and platform installed in 1990
- It was the first Normally Unattended Installation, NUI on the NCS
- It is a small installation. The top deck measures 13 x 13 meters
- 8 slots, 8 wells drilled but only 7 completed and produced
- The production was routed via a multiphase pipeline to the Valhall field centre for processing
- Production ceased in 2013
- Phase 1 P&A completed in 2023
- Phase 3 P&A planned for summer 2025 - Allseas

The surprice

- A-4 was chosen as a warm up well due to it’s low complexity.
- Used SJI (Slot, Jet, Isolate) combined with a casing cutter to wash and retrieve 13 3/8” casing from settled barite.
- We encountered Hydrogen Embrittlement

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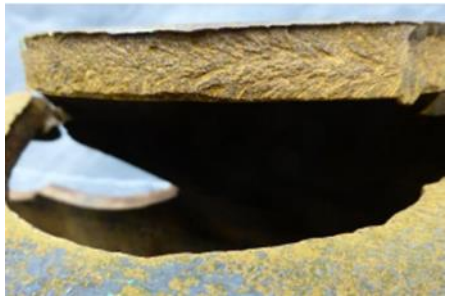
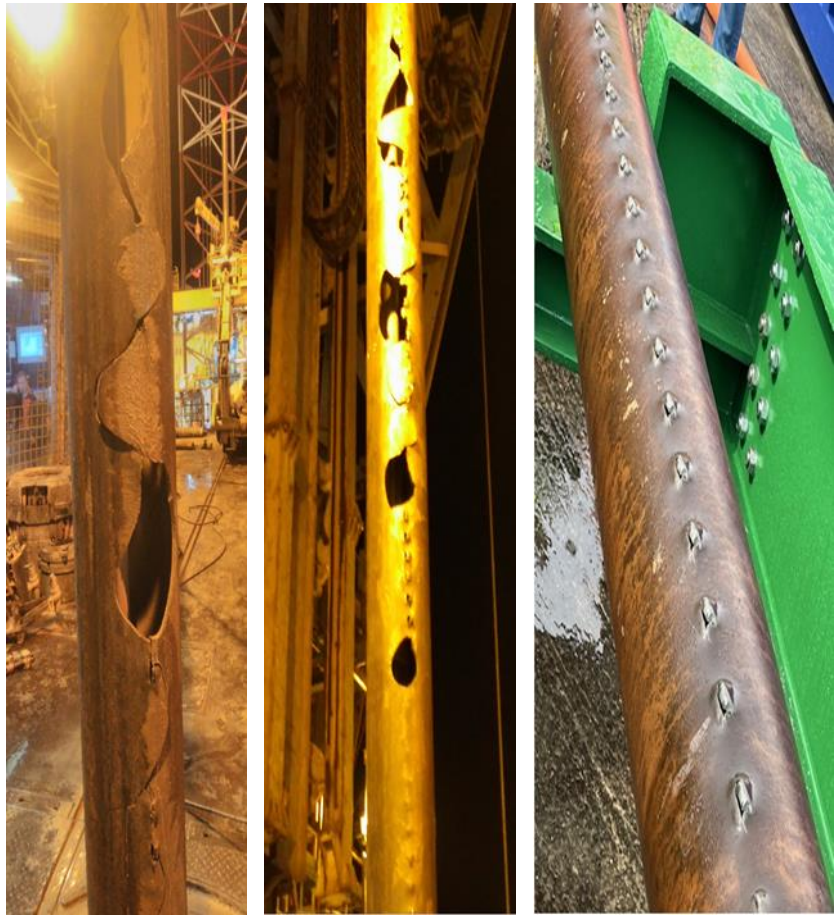




13 3/8” OOH

What good looks like

Hod A Phase 2 Challenges

- Pipeline to Valhall Field center was removed
- 2 out of 4 CT strings left in the wells post intervention phase
- Cemented tubing / A-annulus (Cement & thermaset)
- Hod B platform on production with best producers placed adjacent to Hod A wells
- Reservoir pressure uncertainty

Thermaset from A-2

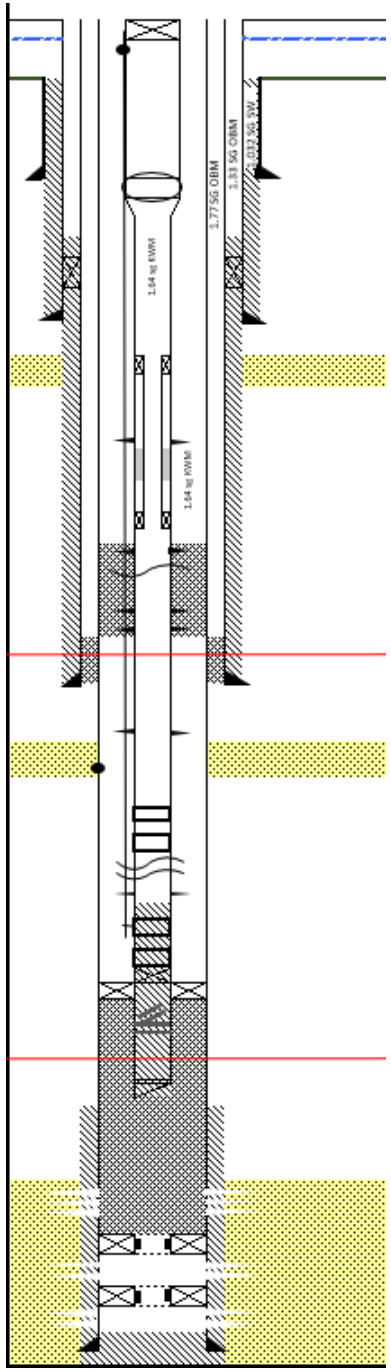
HOD A challenges

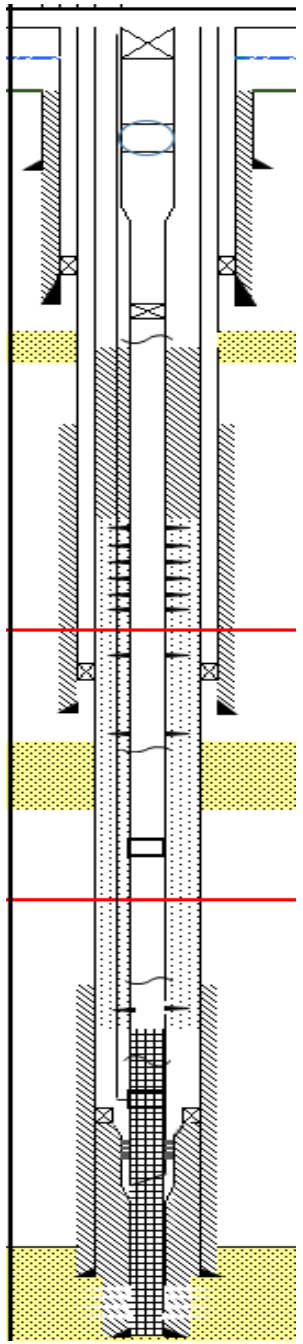
Tubing milling:

- Cut and pull using an Overshot BHA should be the primary recovery method if reasonable tubing sections can be recovered.

- For milling of cemented / stuck 4 ½” tubing inside a 9 5/8” casing, 8 ½” Junk Mill BHA was found to be the most efficient

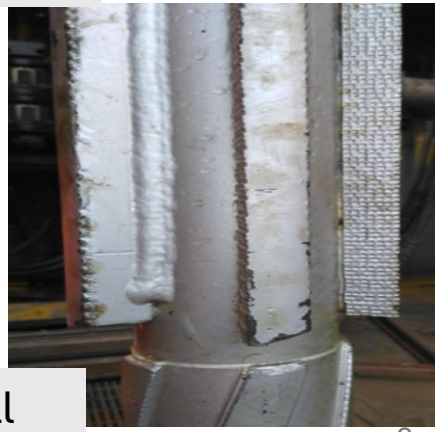
- An all-inclusive milling speed of +/- 2 m/hr can be expected for the 8 ½” junk mill (Not incl BOP inspection)





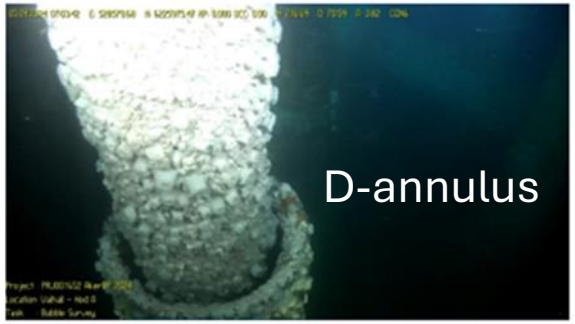
Washover shoe

Junk Mill



Pilot Mill

HOD A challenges cont.



Picture 15: Conductor 8 (69m) - No leak observed

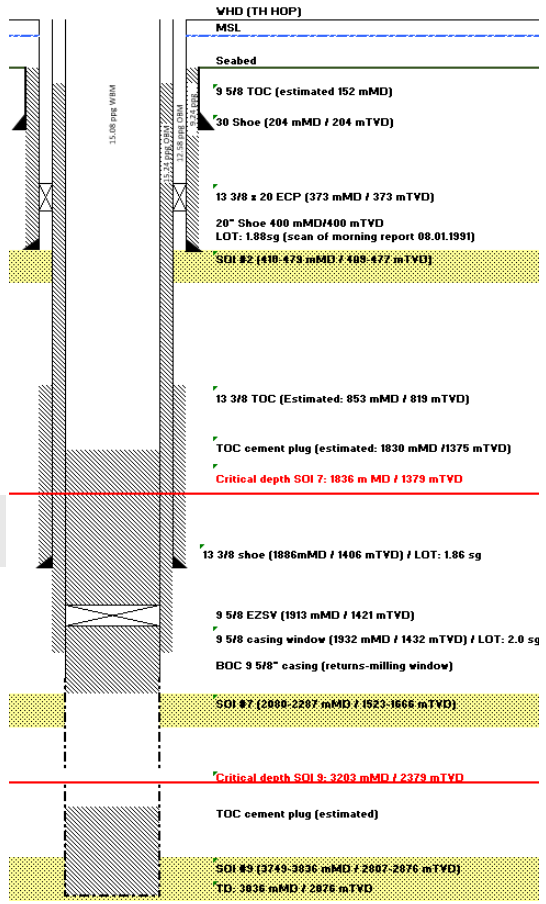
9 5/8” x 13 3/8” Sandwich joint

Sandwich joints –methology was introduced at Valhall DP.

Cutting out 12 m pieces of 9 5/8’’ and 13 3/8’’ cemented joints and retrieving them with spear / down hole jack

- 3 wells with Braidenhead cementjobs Good Tail cement bullheaded in 9 5/8” x 13 3/8” annulus down to 13 3/8” shoe

A-1

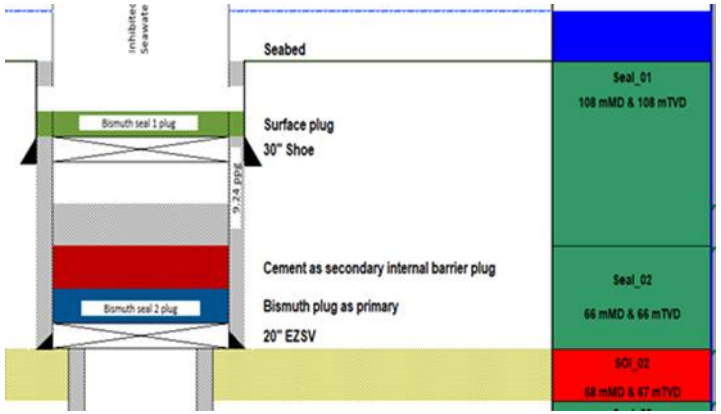


Seal 2

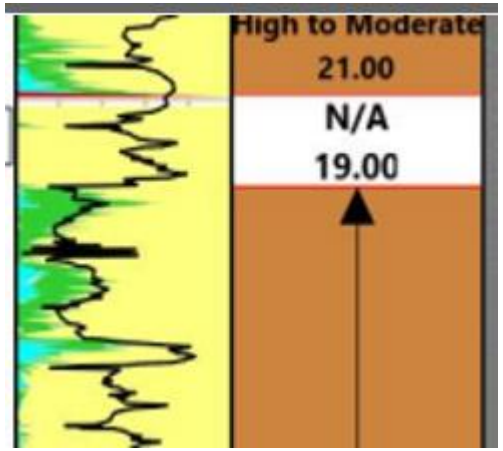
Seal 7

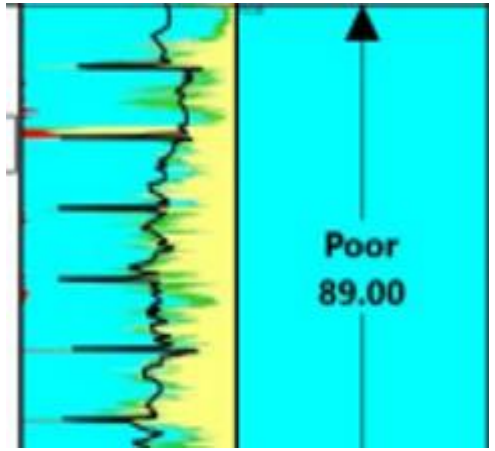
HOD A Challenges cont.

- During well construction 30in conductor was cut and retrieved from 2 to 8m above mudline
- D-annulus monitoring done by ROV (2017 and 2023)
- 2 wells with bubbles: A-5 and A-8



- Log result from the two wells logging 20in from seabed to 30in shoe





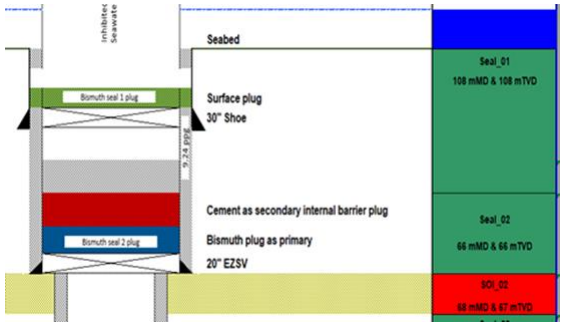
Picture 15: Conductor 8 (69m) - No leak observed

HOD A P&A

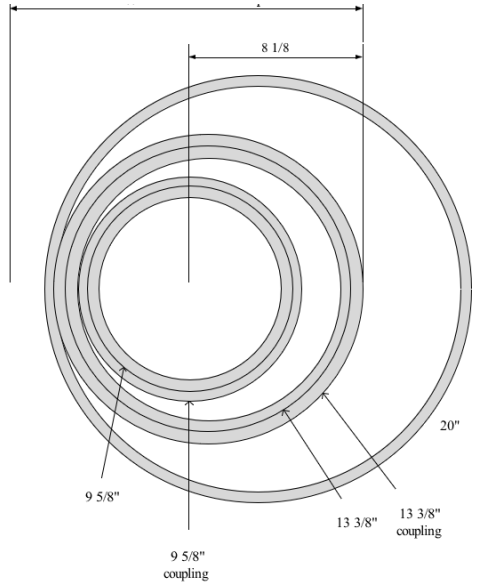
- High probability of damaging 20in casing when cutting 9 5/8” x 13 3/8” casing

- A – thorough risk assessment were made – looking at this new risk picture, using kick stand to lower the sandwich string below BOP in a well control situation (SOI 2)

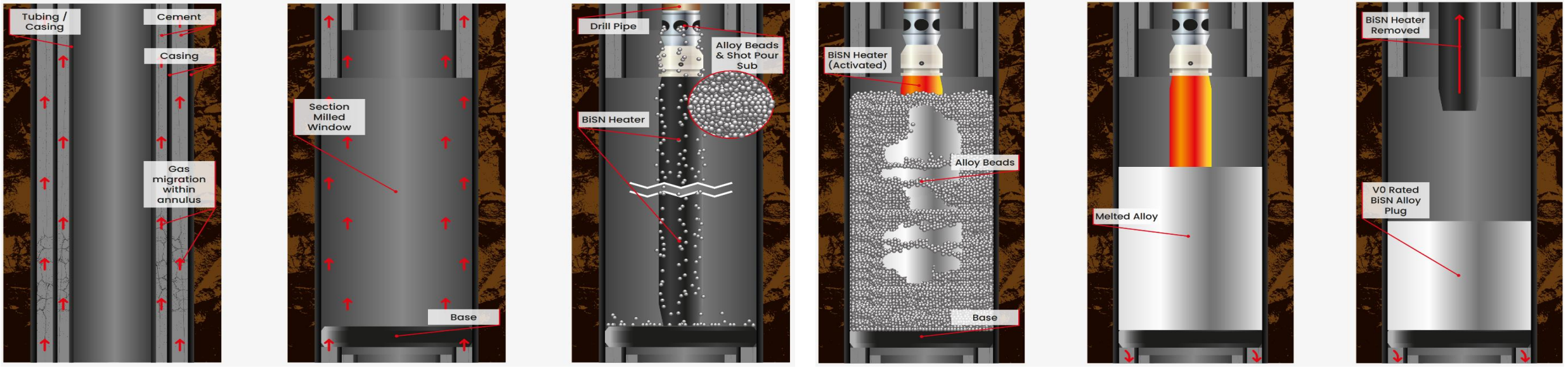
Picture 15: Conductor 8 (69m) - No leak observed



16” in min knife sweep

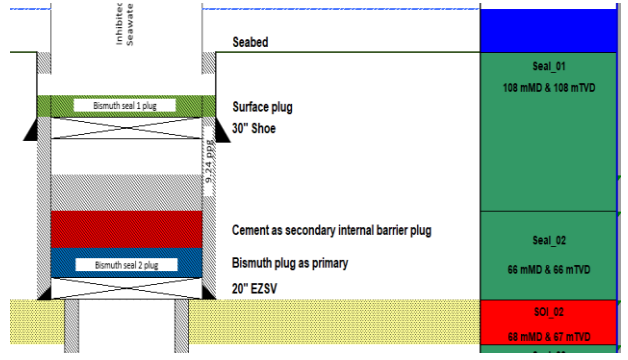


Bismuth: The beads plug vs the casted version



Heater OD for Seal 2 – 7 5/8" – 7,2 m
Heater OD for Seal 1 – 11 ¾" – 8.3 m

Due to casing design on HOD A the casted plug OD was to big



HOD A P&A

New Technology used:

SJI – Slot Jet Isolate used to puncture casing and wash out settled barite for easier retrieval of casing

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CICM – Circumferrential cement bond logging on drill pipe.

Sandwich joints –enhanced methodology for cemented casing retrieval, dependent of 13 3/8” casing cement

Bismuth – Taken the plugs a step forward – using bismuth beads instead of casted bismuth

HOD A P&A Phase 2 completed

- ✓ Without any harm to people, assets and environment
- ✓ Ahead of schedule
- ✓ Under budget
- ✓ No negative impact on future Hod B production
- ✓ Solid basis / data for defining future improvements
- ✓ No Bubbles observed as per ROV survey Sept 2024
- ✓ Simops operation –Decom preparation work