

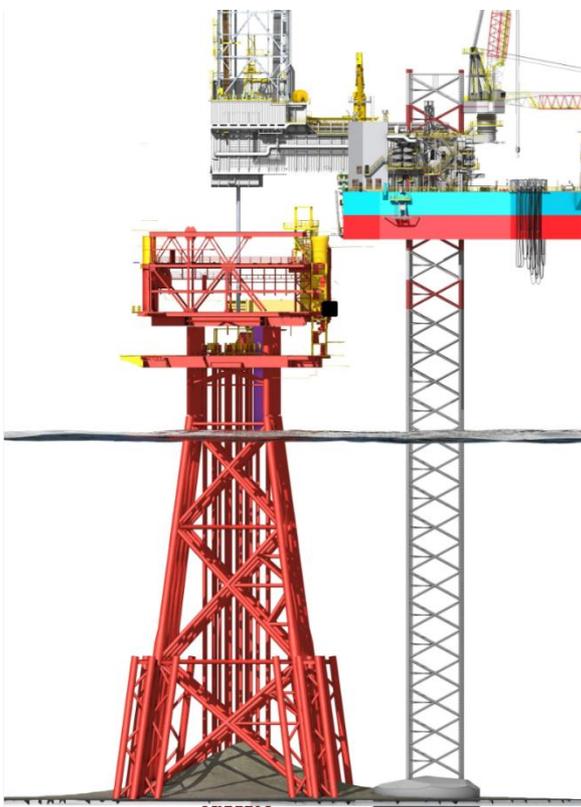
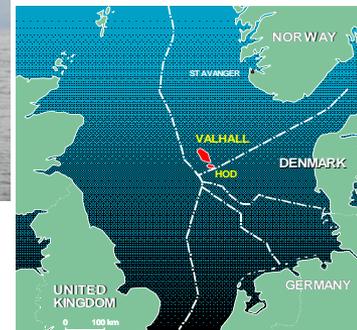


Valhall DP P&A project: “The Project that has it all”

Keep it Simple – Safely Delivering Great Performance

Valhall P&A Team
BP Norway

Stavanger, September 2016



Business outcomes

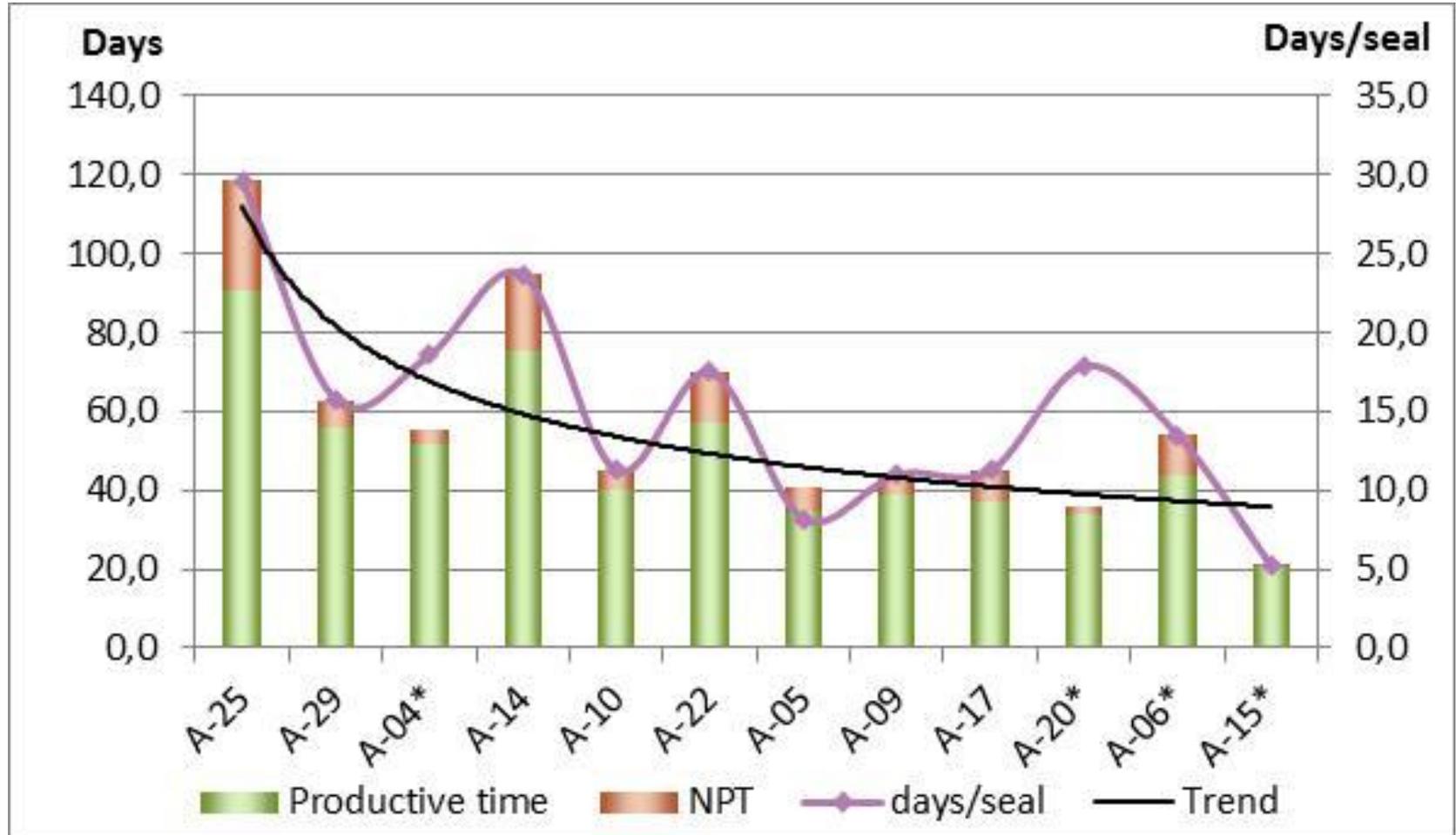


Delivered safe, compliant, reliable and competitive wells operations

In addition, the “One Team” was able within 25 months of operation to:

- Reduced the average days per P&A’d well by 45%
- Reduced the costs per P&A’d well by average 35% (total savings \$210MM)
- Deliver 13 wells P&A’d towards the end of rig contract versus 6 original planned.

What we have delivered so far



Worked 16 156 hrs with 2 623hrs Non Productive Time – i.e. 14,4%

What is Performance ?



Changing a tyre:

Similar scope of work, but one has been developed to perfection: 1.5 hrs vs 1,93 sec (Red Bull nov '14).

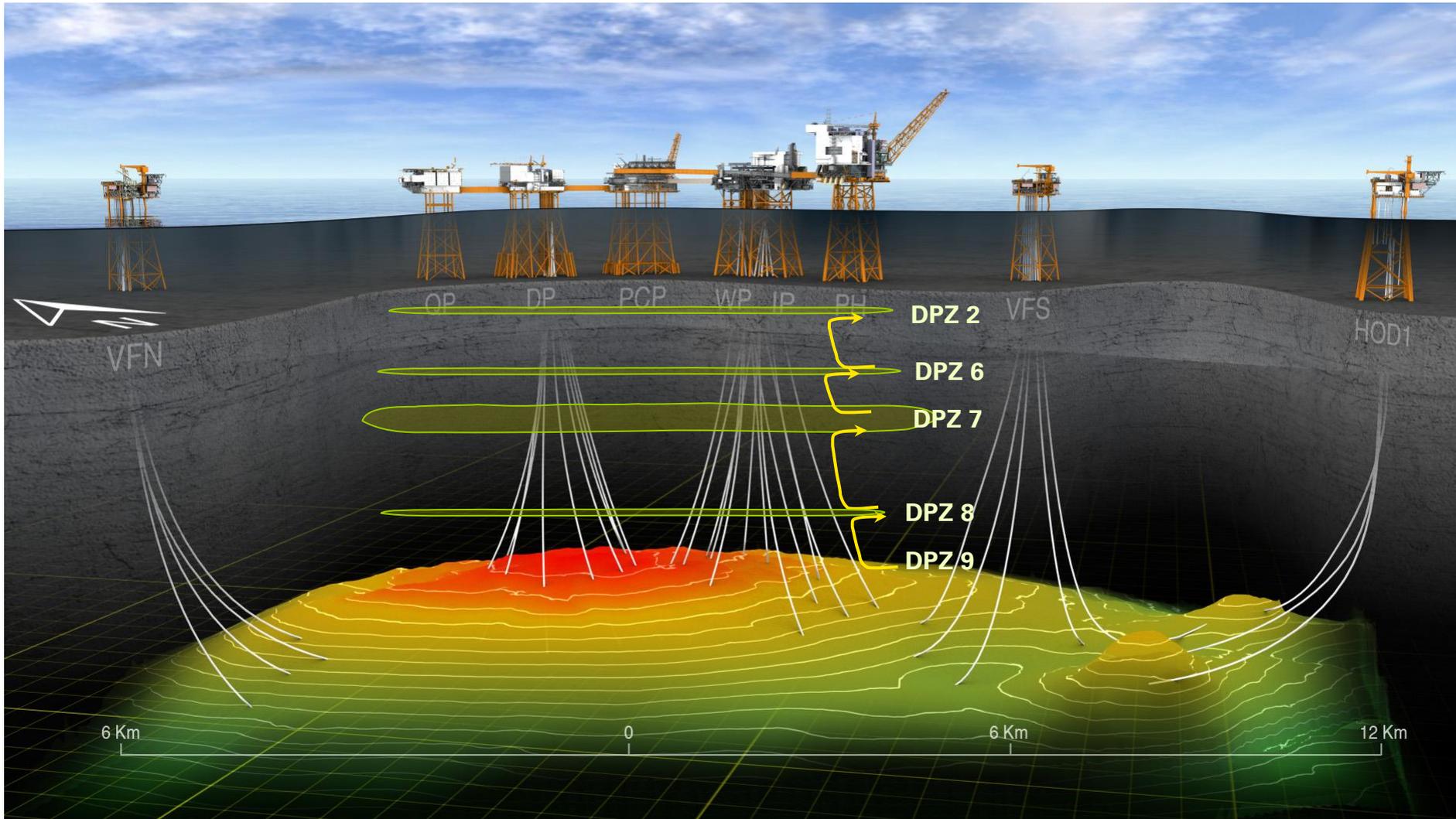


Valhall DP P&A project



- Two teams joined together, engineers and operations
- One of the biggest P&A project within the BP group for a decade (31 wells on DP, and 8 on Hod).
- Required to deliver compliant P&A' d wells as per local guidelines (NORSOK D-010) and internal procedures (BP Group Practices).
- Extreme high focus from the organization on how the ONE TEAM set a “standard” for estimating the provisions
- Nine DPZ and a very complex overburden

Strategy for Valhall DPZ zonal isolation



Building Blocks



- Kill A-annulus
- Recover tubing
- Clean out and log 9-5/8" casing
- Restore seal 9, 8, and 7 (PWC)
 - Kill B-annulus
 - Remove C-section
 - Recover 9-5/8" casing
 - Clean out and log 13-3/8"
 - Restore seal 6
 - Kill C-annulus
 - Remove B-section
 - Recover 13-3/8"
 - Clean out and log 20"
 - Restore seal 2
- Install surface barrier



- Implement Lessons Learned, and optimize your “building blocks”
- Measure yourself – **don’t be defensive** or afraid that you are **held accountable for your inefficiency**. Instead provide the shortcomings in the operations (open culture).
- Have regular re-cap sessions with the birds eye view, and see if you are still in line with the original objectives.

Refine procedures and standardize



- Once you have obtained the best practices, standardize this. See if these “building blocks” can be used multiple times within the project
- Break down the project in smaller “pieces”.
 - Dive into the details – the devil is in the details
- Repeat your best practices, and build competence and confidence within the team



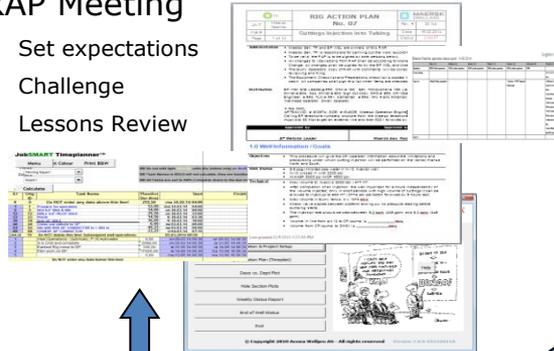
Technical Limit Process



Bi weekly Performance Meeting

RAP Meeting

- Set expectations
- Challenge
- Lessons Review



In line with service delivery model PDSA

Plan

Learn

Do

Measure

Our mission: safe, compliant and reliable wells

Why?

- No Accidents, No Harm to People, No Damage to the Environment
- Deliver the plan efficiently

Performance in Wells

A Good day in GWO

- Maintained control of hydrocarbons and no one got hurt
- Risks understood and barriers in place
- Effectively delivered the activity – quality, cost & time
- Everyone on the team made a difference
- Today better than yesterday

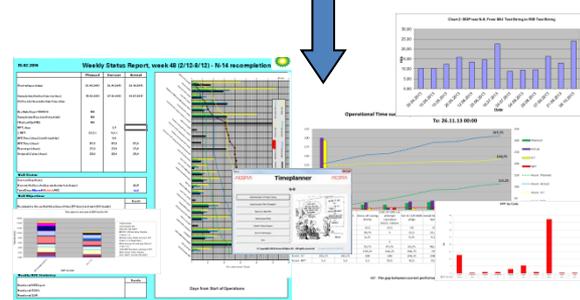
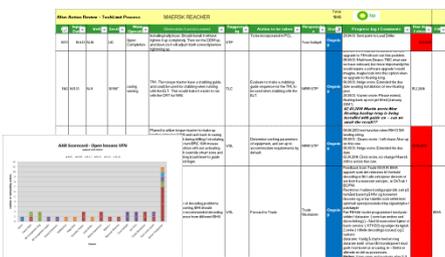
GWO

GWO Safety Plan

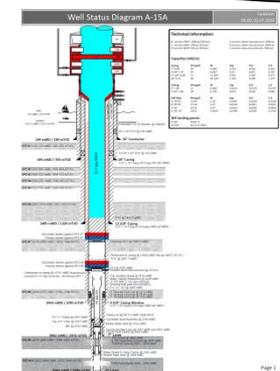
After Action Review

What was planned?	What actually happened?	What was the difference and why?	What's learned	Action
Operate on well A...	Well A was shut in due to a gas leak...	The gas leak was caused by a faulty valve...	Check all valves before starting work...	Implement a valve inspection checklist...

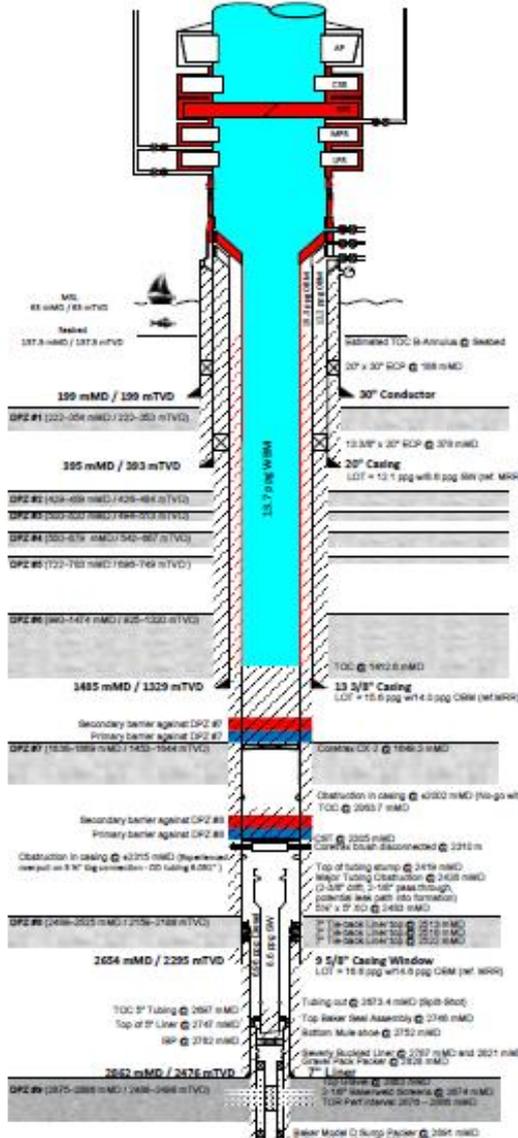
Lessons Learned Database



Performance Tracking



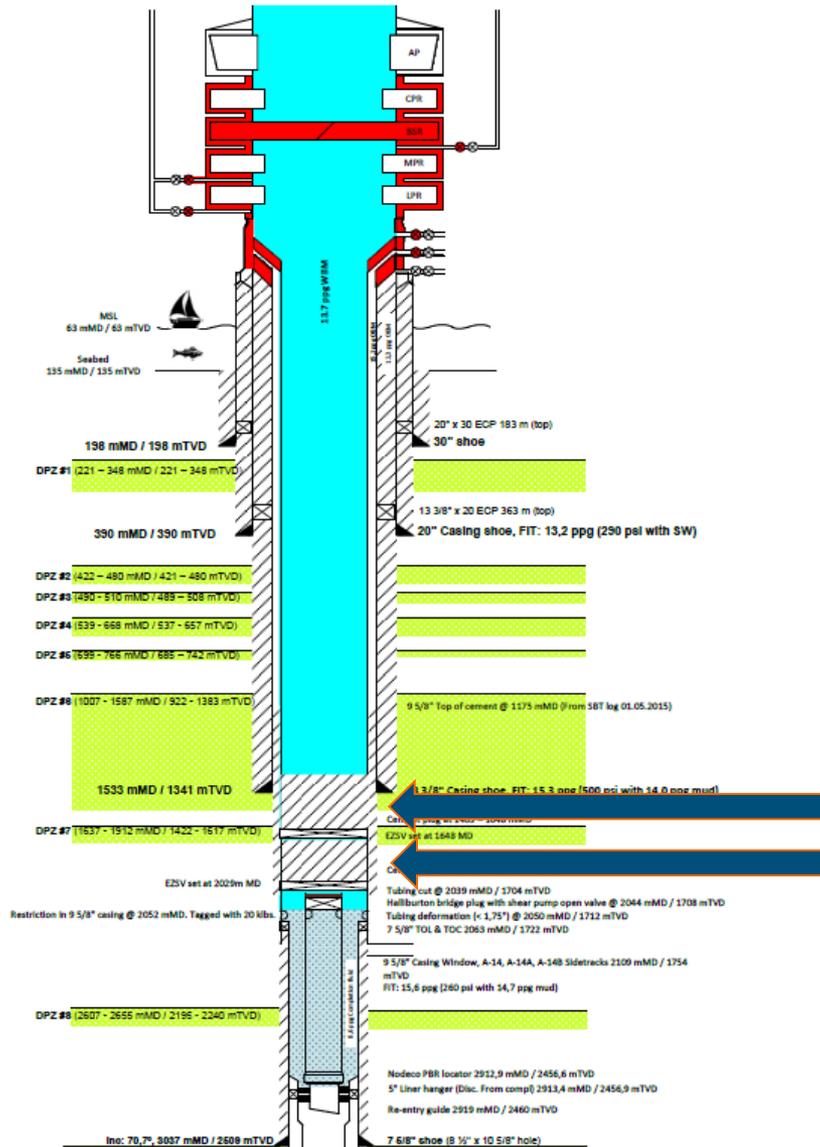
Daily Well Status – Communication Tool



VERIFICATION OF BARRIERS SEAL 8					
Date	Operation	Top	Blm	Mud	Comment
28.06.16	SBT logging for annular barriers outside 9 5/8" csg	1869 mMD 1643.2 mTVD	2295.4 mMD 1996.8 mTVD	WBM 14.2 ppg	SBT log showed 426.4 mMD / 353.6 mTVD of circumferential bonding within Seal 8.
29.06.16	Internal cement plug inside 9 5/8" casing	2063.7mMD 1804.3 mTVD	2305 mMD 2004.8 mTVD	WBM 14.2 ppg	Length of plug: 241.3 mMD / 200.5 mTVD. Load tested to 16 kibs (29.06.16). Pressure tested to 300/1000 psi for 5/30 min. CST installed as foundation.

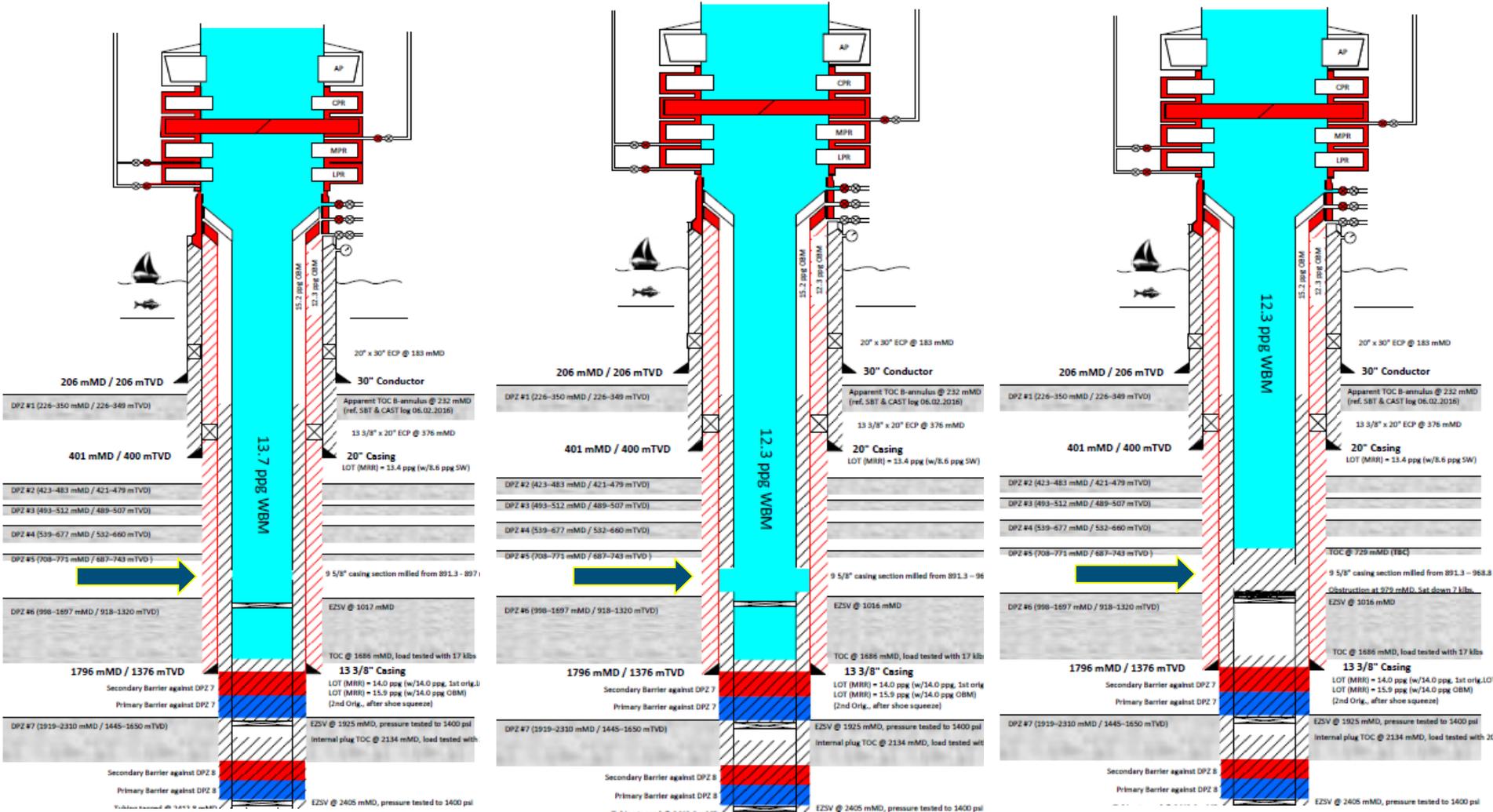
VERIFICATION OF BARRIERS SEAL 7					
Date	Operation	Top	Blm	Mud	Comment
28.06.16	SBT logging for annular barriers outside 9 5/8" csg	1485mMD 1328.4 mTVD	1636 mMD 1452.4 mTVD	WBM 14.2 ppg	SBT log showed 151 mMD / 124 mTVD of circumferential bonding within Seal 7.
30.06.16	Conetrac CX-2 plug installed in 9 5/8" csg	1649.3mMD 1463.3 mTVD	1650.2 mMD 1464 mTVD	WBM 14.2 ppg	Tagged with 8 kibs (30.06.16). Pressure tested to 300/1000 for 5/30min (30.06.16)
30.06.16	Internal cement plug inside 9 5/8" casing	1412.6mMD 1268.9 mTVD	1649.3 mMD 1463.3 mTVD	WBM 14.2 ppg	Length of plug: 236.7 mMD / 194.4 mTVD. Load tested to 20.6 kibs (01.07.16).

Daily Well Status – Communication Tool Shale and PWC

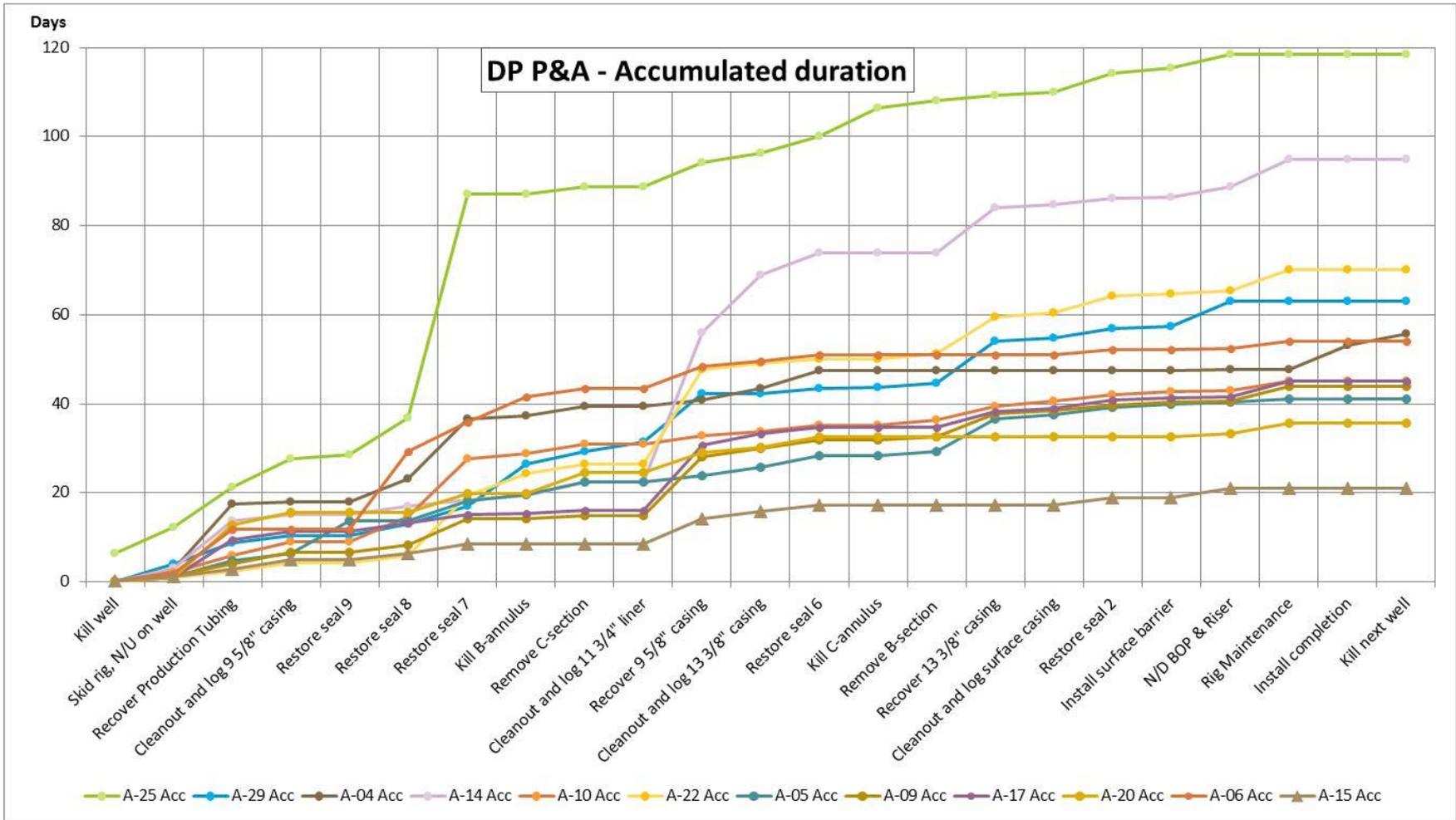


Perf, Wash & Cement barrier
Shale barrier externally, cement internally

Daily Well Status – Milling casing inside casing



Improving results



Business outcomes



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More important, we are setting a thorough high standard on how to deliver safe and compliant P&A wells for the future.

End of the first phase of the project

