Havtil Norwegian Ocean Industry Authority

TECHNICAL SEMINAR PLUGGING & ABANDONMENT (P&A)

7th of May 2026

Havtil Havindustritilsynet

Plug and Abandonment seminar 2026

Norwegian Ocean Industry Authority

09:00 – 09:10 Welcome & Introduction	Finn Carlsen, Havtil
09:10 – 09:30 Updates from HAVTIL P&A	P&A gruppen, Havtil
09:30 – 10:00 Global Decommissioning Outlook	Anya Albot, Rystad Energy
10:00 – 10:25 Equinor P&A Outlook	Stein Åtland, Equinor
10:25 – 10:45 Coffee Break	
10:45 – 11:10 Through tubing abandonment	Fernando Zapata, Archer Wells
11:10 – 11:30 Learnings from Knarr & Gaupe PP&A	Lars Hestenes, Norske Shell
11:30 – 11:50 NCS Outlook & Technology Roadmap	Magnus Svensson, Offshore Norge
11:50 – 12:40 Lunch break and Networking	
12:40 – 13:10 To flow or not to flow	Ruth Thomas, Well Safe Solutions
13:10 – 13:35 Updates from GoRadical	Tim Croucher, ETN
13:35 – 14:00 Shale as an engineered barrier	Torolf Wedberg, Matteo Loizzo
14:00 – 14:20 Coffee break	
14:20 – 14:45 A sustainable circular economy success story	John Knowles, SLB
14:45 – 15:00 Wrap-up (What did we learn/share today)	Nina Ringøen, Havtil

Norwegian Ocean Industry Authority

Welcome to the 3rd

Plug and abandonment Seminar 2026

Theme: Collaboration and sharing of collective learnings

Update from HAVTIL P&A group

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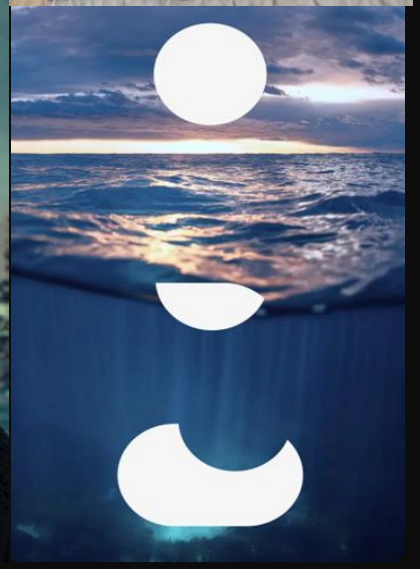
Societal assignment

- Havtil will set the terms for and follow up that the participants in the industry are maintaining a high level of **health, safety and the working environment** as well as security.

Objective

- The ambition that Norway's petroleum& ocean industries will be the **world leader for HSE** remains unchanged.



Are we ready?
Outlook from 2026 - 2050

Several fields in production will have a decline in production rate from 2030…

More than 2300 wells expected to be permanent plugged between 2026 – 2050/2070.

Wild Well Control reports an increase in well control incidents globally

Are WE on NCS prepared ?

Collaboration and collective learnings

- **Sharing collective learnings and experience-based knowledge will boost the chances of success in P&A operations**
- **Qualification and use of new technology will play an important part of the P&A industry**
- **Continuous improvement is one of the key principle in the Norwegian HSE regulations**

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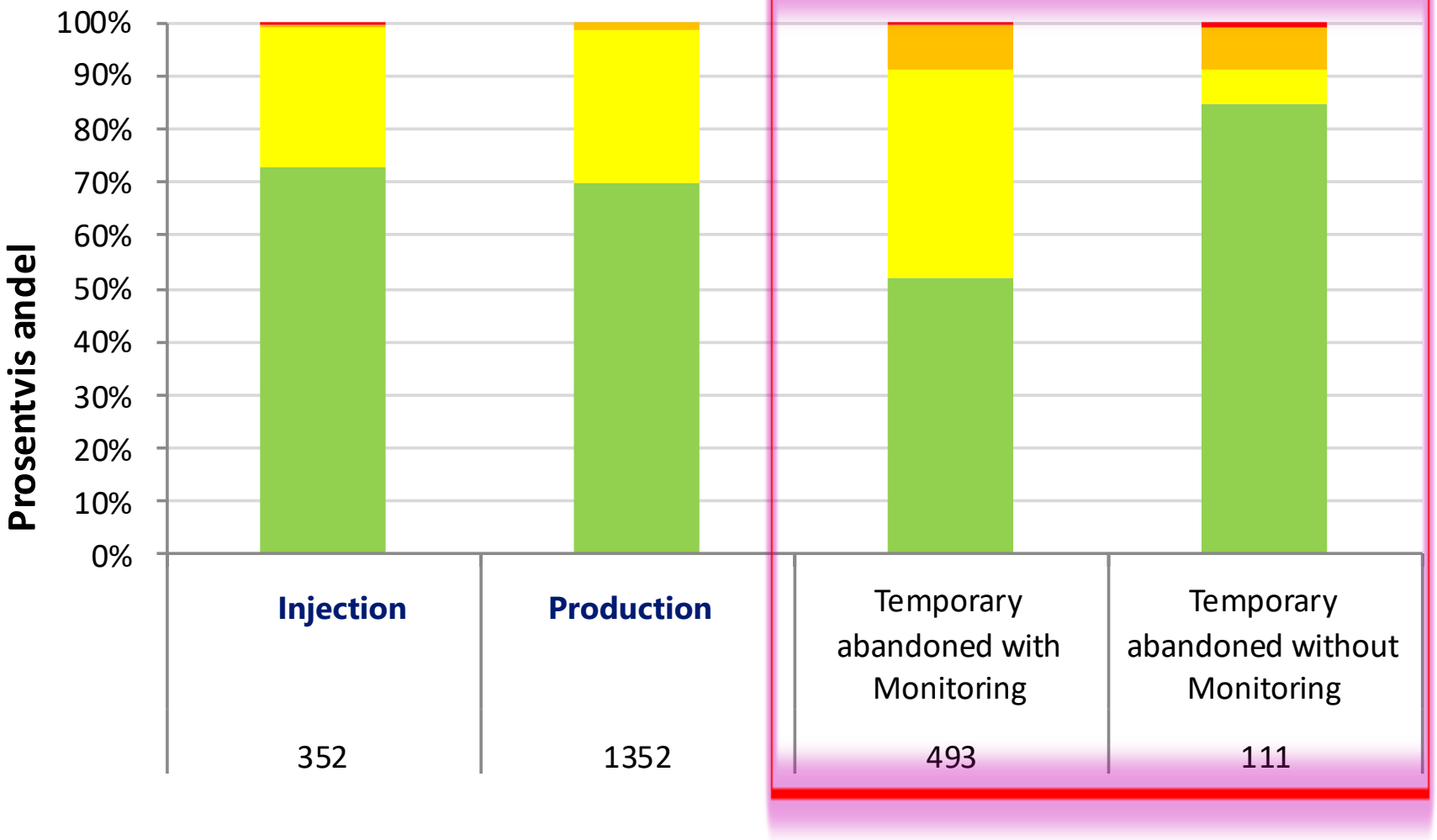
2308 "active" wells on NCS -2026

Category	Principle
Red	One barrier failure and the other is degraded/not verified, or leak to surface
Orange	One barrier failure and the other is intact, or a single failure may lead to leak to surface
Yellow	One barrier degraded, the other is intact
Green	Healthy well – no or minor issue



Andel brønner i kategori

- Rød
- Oransje
- Gul
- Grønn

- **26% of wells are temporary abandoned or inactive**

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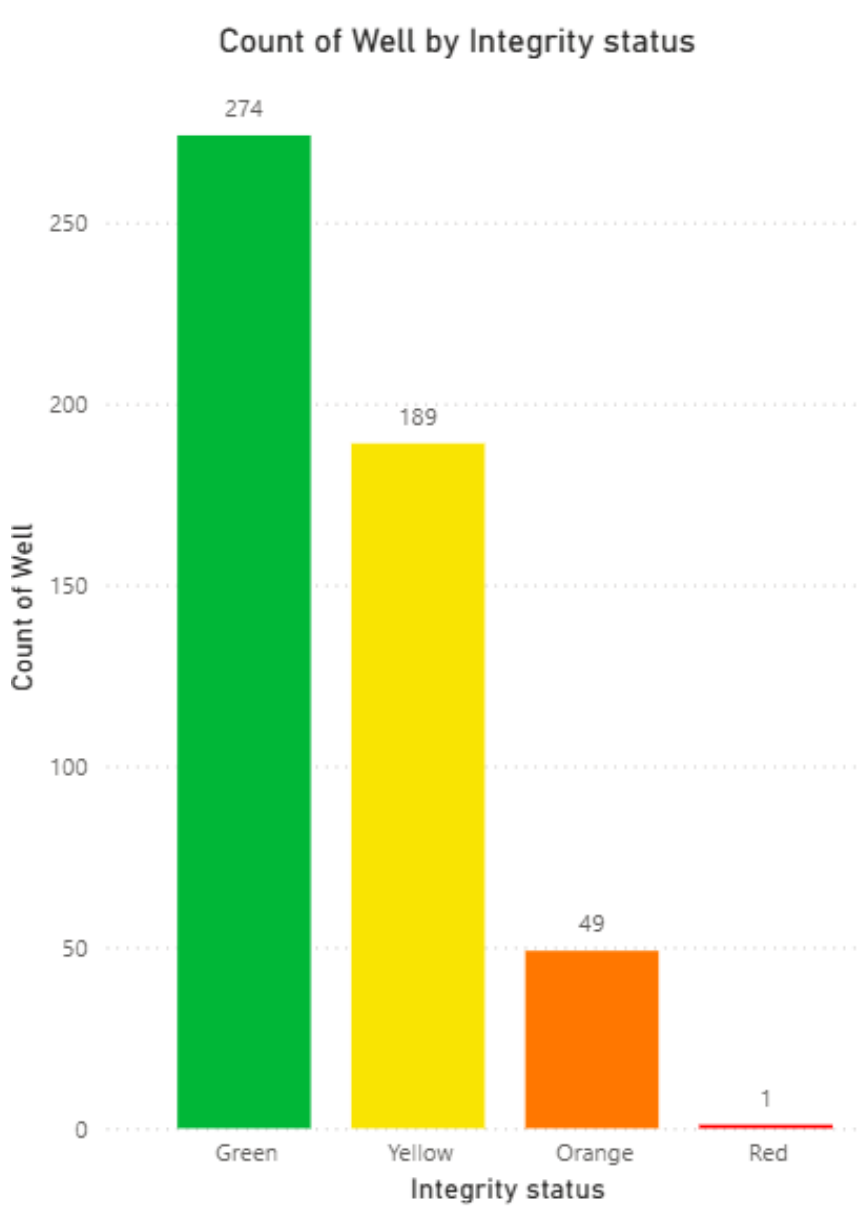
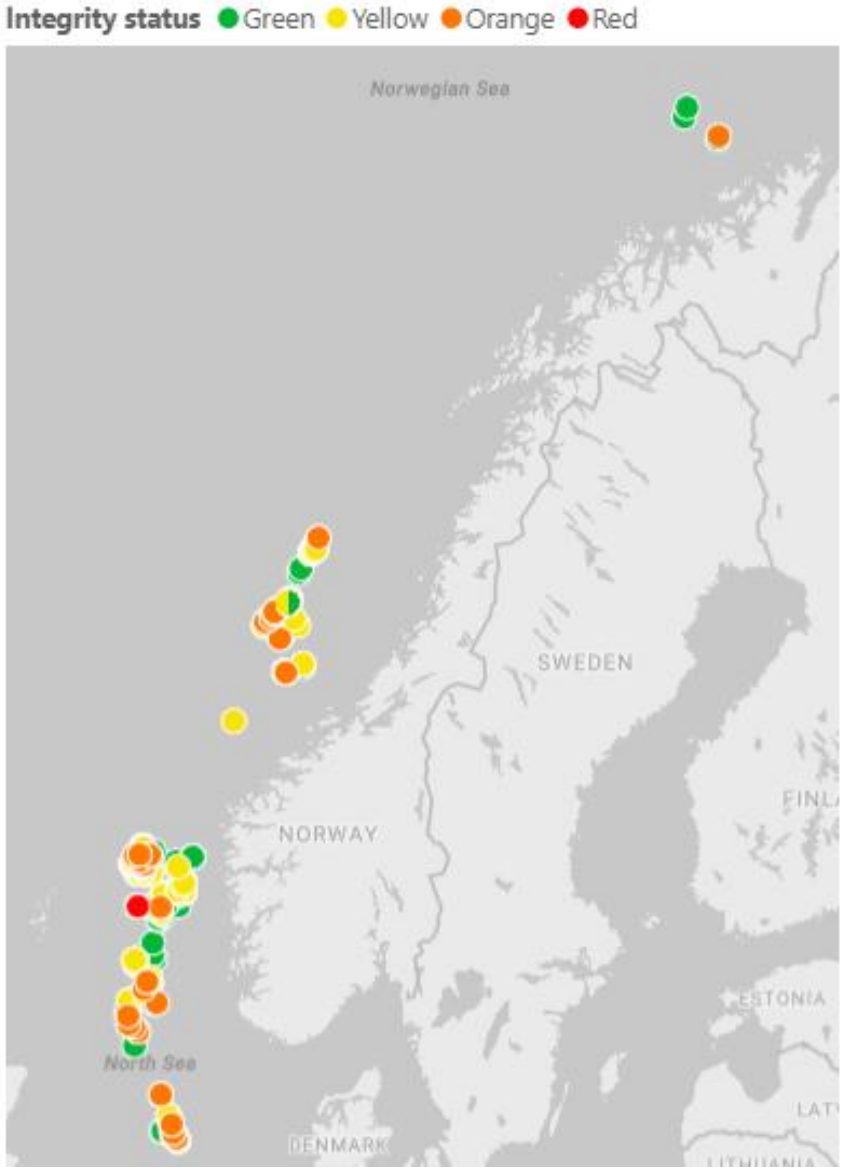
Temporary abandoned wells 2026





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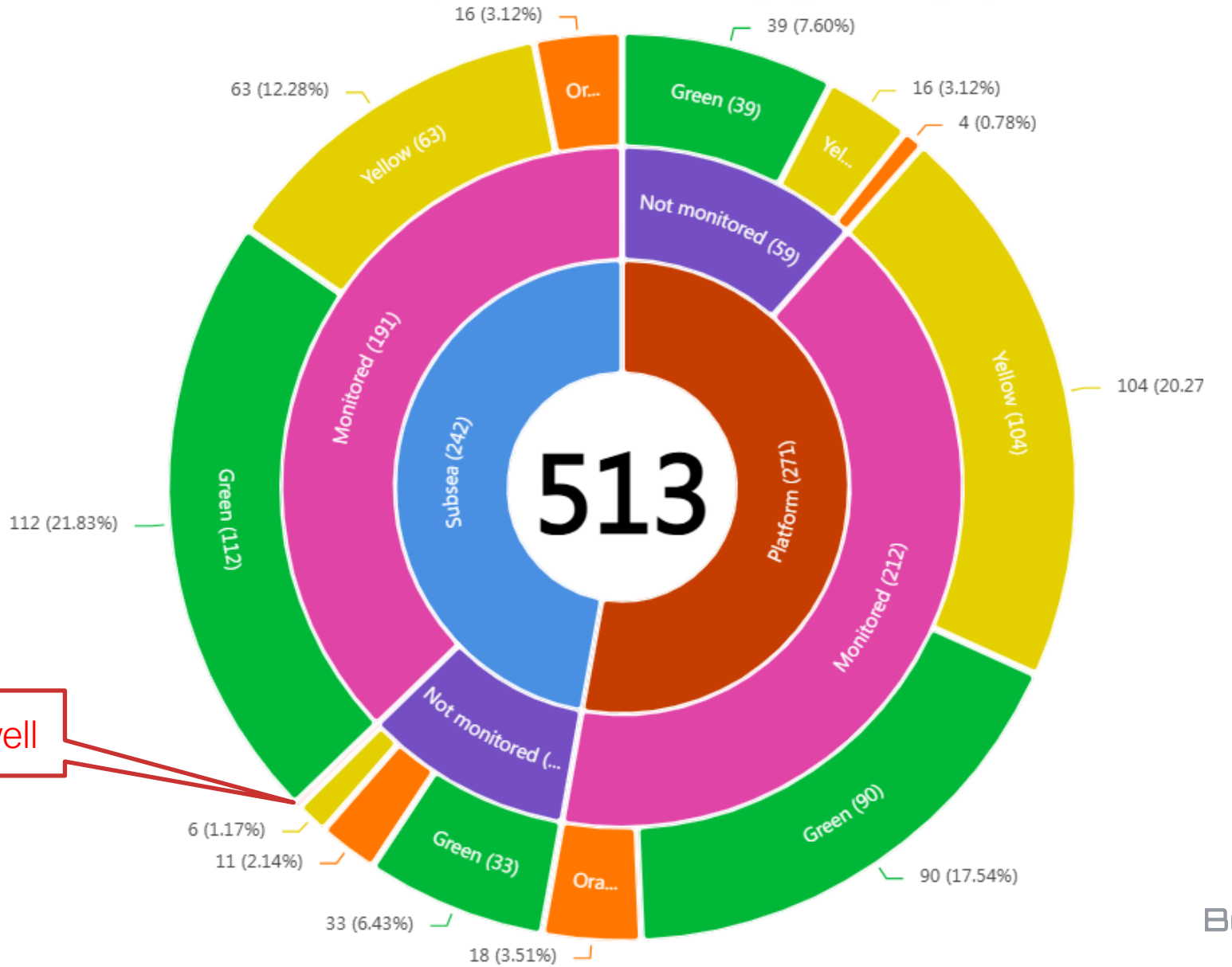
Better Energy Together

Overview 2026 survey



1 red well

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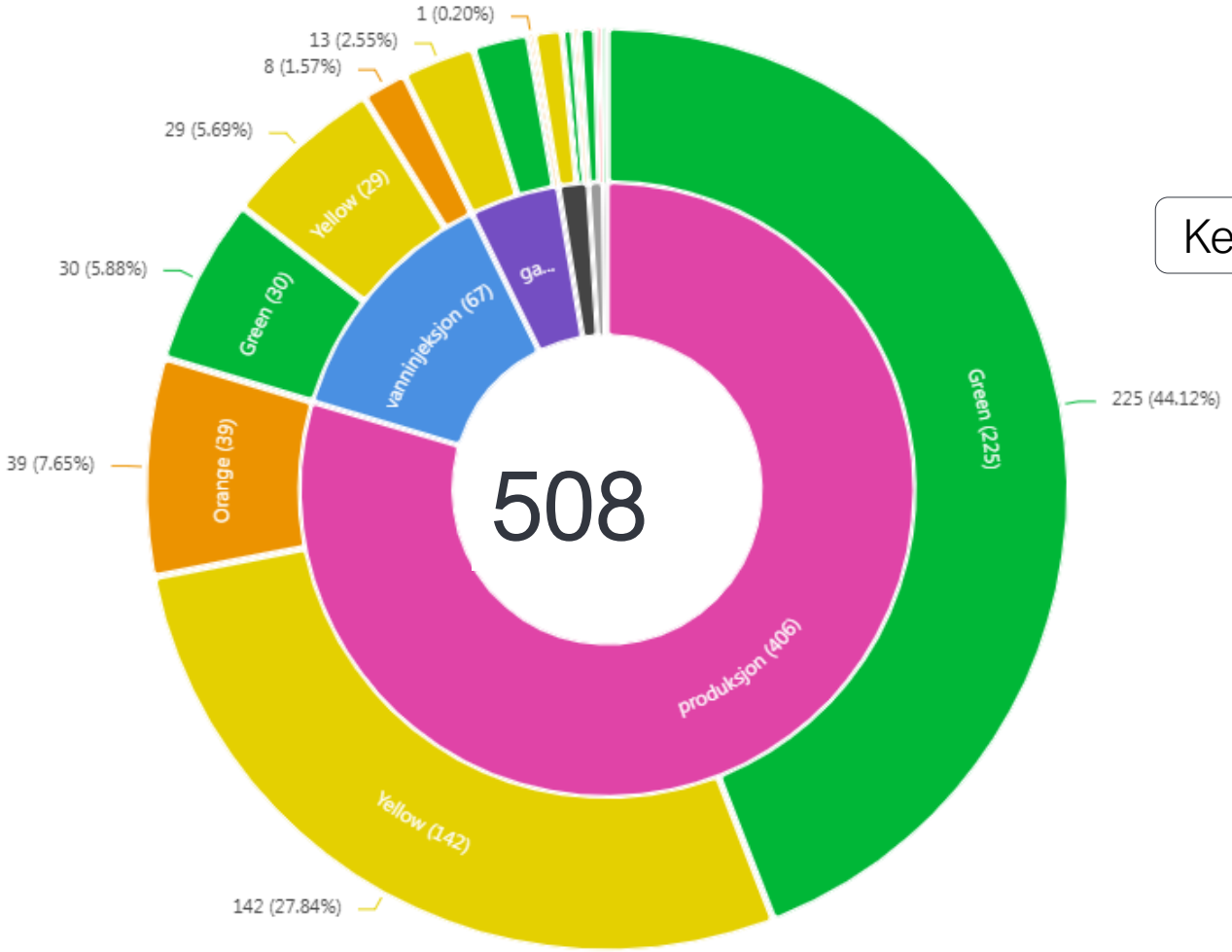
Exploration vs Development

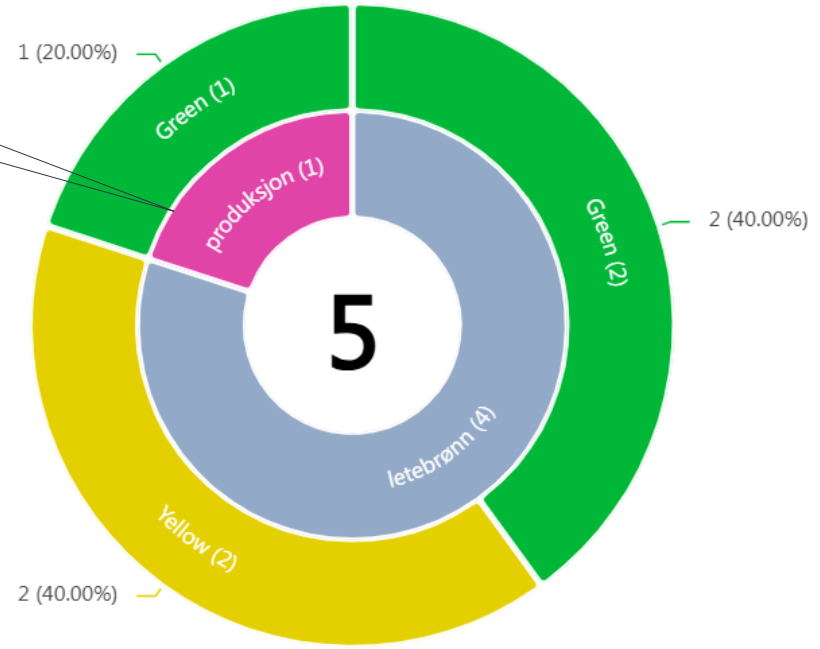
2026

Development wells



Exploration wells

Keeper well



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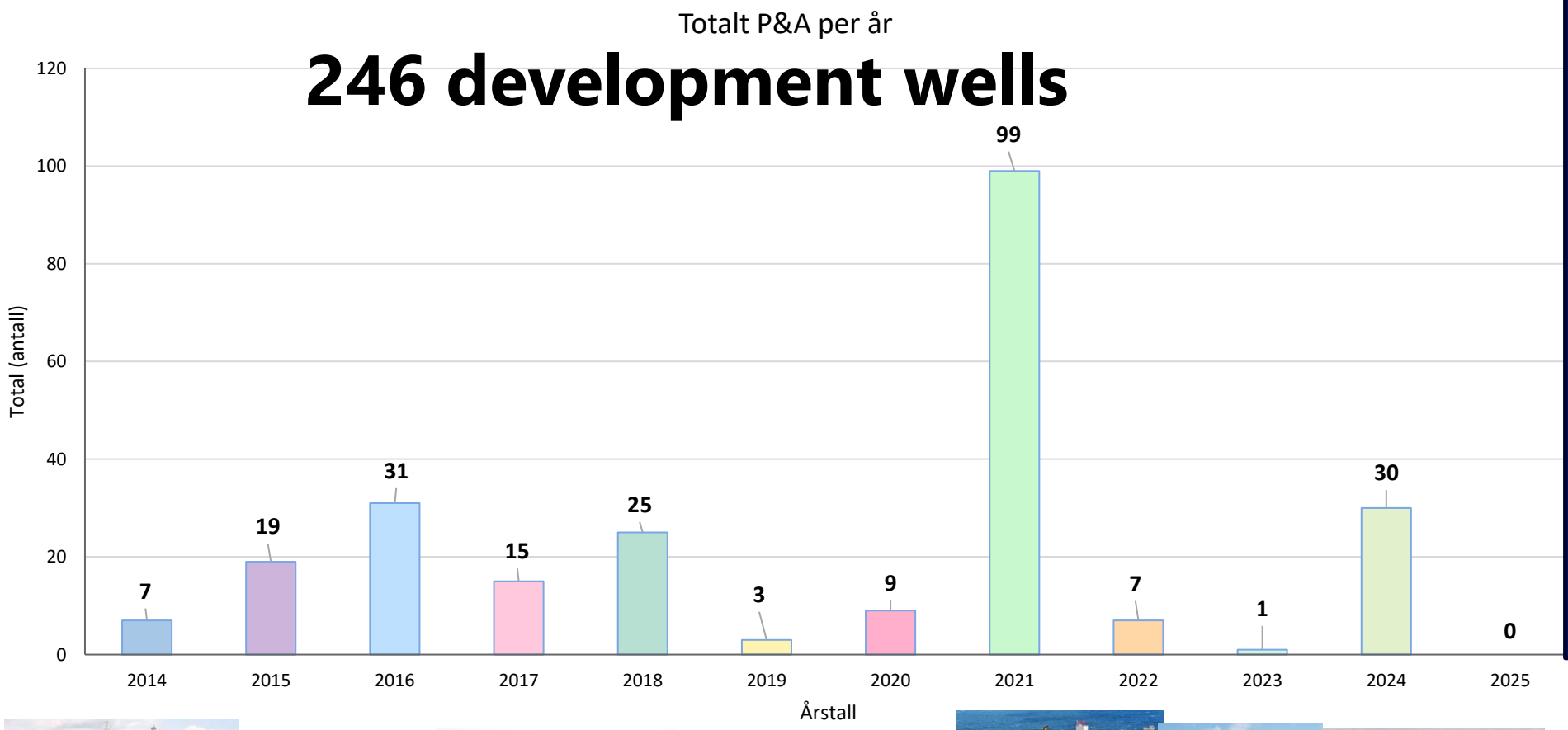
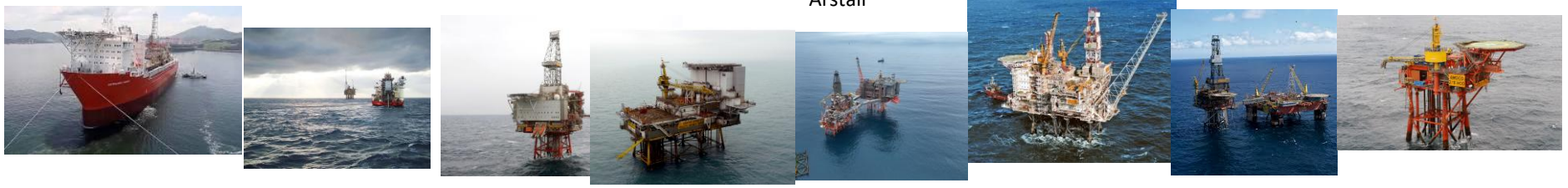
Permanent plugging & Abandonment 2014 - 2025



What did we learn ?

What kind of technology were used ?

Do we share «best practise» ?



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How many years will we spend to Permanent P&A wells ?

- We have more than **2300 wells** on NCS today
- 35 days per well PP&A «average» or 10 days per well **best case**
- Most likely + /- 50 years with a mix of production activities, exploration drilling, well intervention & P&A at the same time
- **Do we have enough people, capacity, rigs/vessels, competency and best available technology ?**

A high safety level is perishable….

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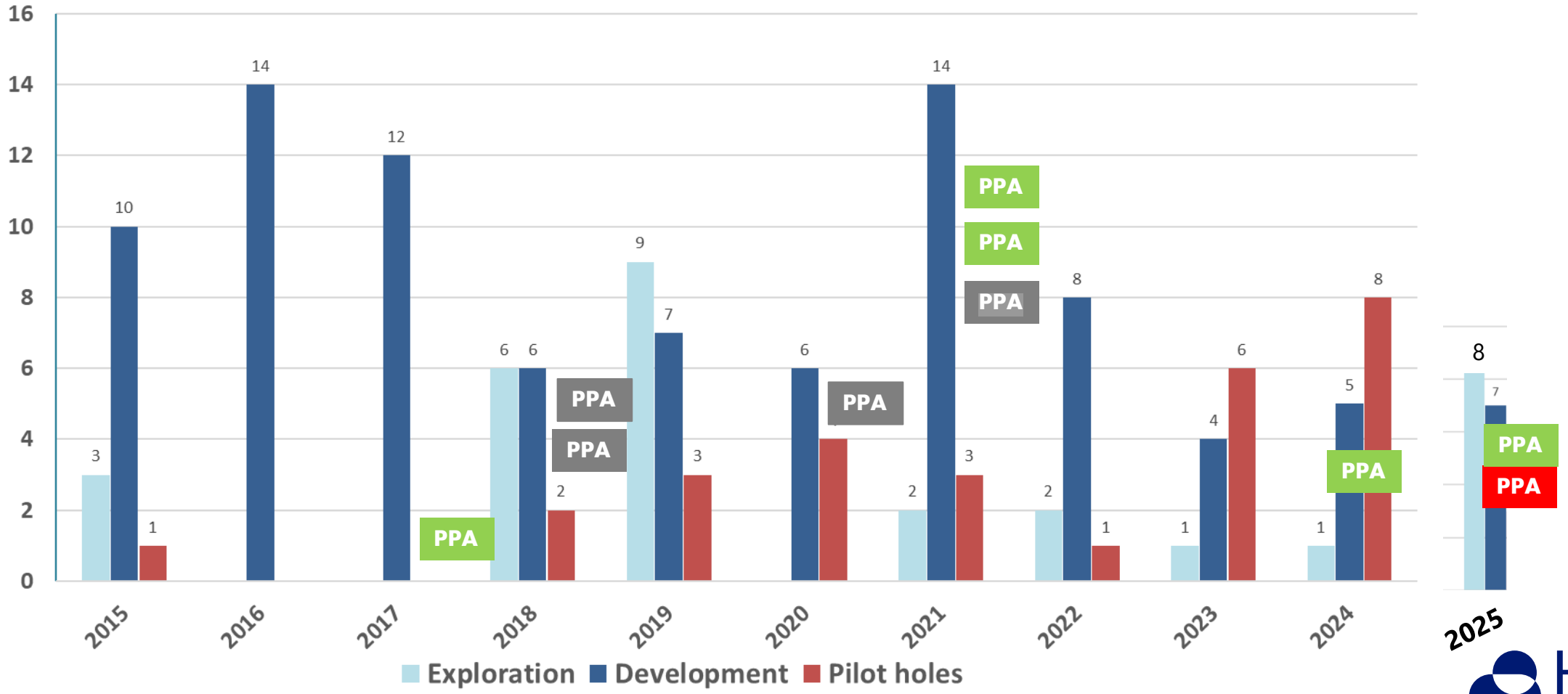
Well Control Incidents per well type 2015-2025



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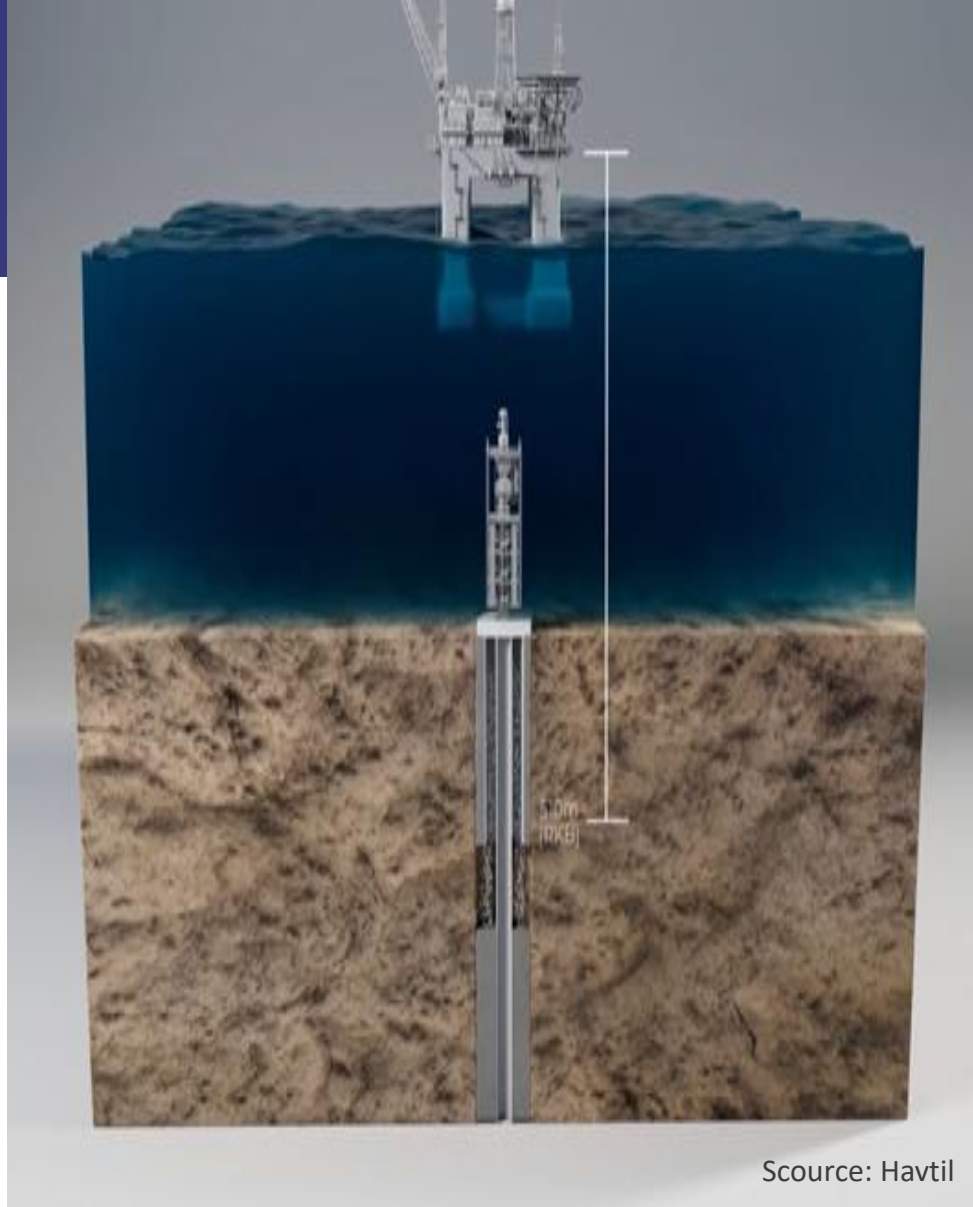
Well Control incidents in P&A operations

Permanent plugging of well 23.09.2025

- Cut 13 3/8" casing at 510 m with mechanical cutter, rotation and pumping
- After casing was confirmed cut, gas/water flow to shakers and drill floor
- Triggered ESD1 and mustering
- Diverter was activated shortly after observed flowback, and annular BOP fully closed within 71 secunds
- Situation normalised after 30 minutes

Lessons Learn: Close annular in BOP when cutting casing shallow due to potential for trapped gas in casing annulus.

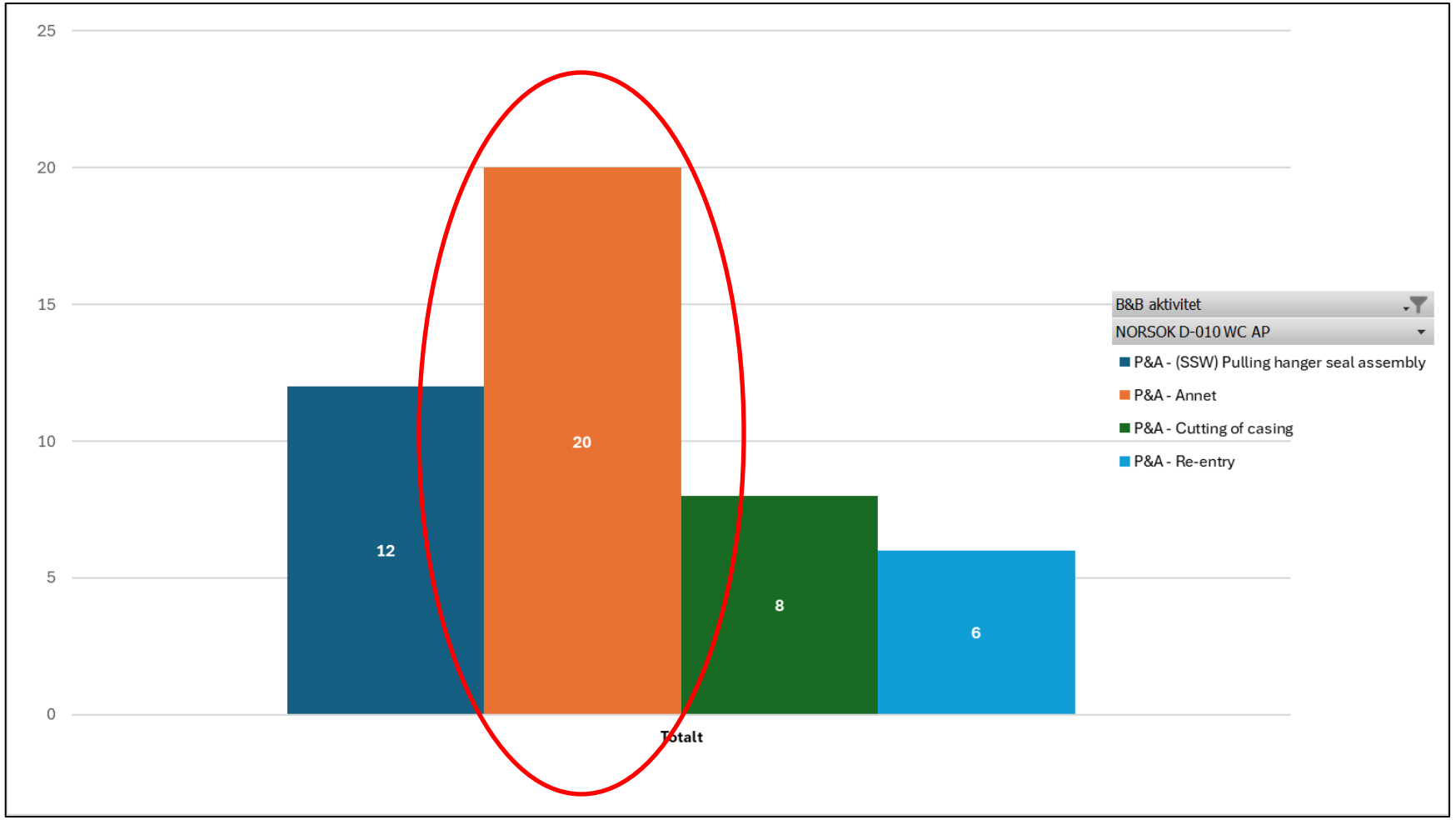


Scource: Havtil

Shallow casing cut → Trapped gas in casing annulus → Open annular preventer → Unignited HC release

P&A related well incidents 2017 – 2025

Well control Action Plans (NORSOK D-010, rev. 5 2021)



Norsok D-010 Table 23 — Well control action plans P&A		
Item	**Description**	**Comments**
1.	Cutting of casing	Fluid losses or trapped gas pressure in casing annulus
2.	(SSW) Pulling casing hanger seal assembly	Fluid losses or trapped gas pressure in casing annulus
3.	Re-entry of suspended or temporary abandoned wells	Account for trapped pressure under shear ram or under plugs due to possible failure of temporary plugs

This list is not comprehensive and additional scenarios may be applied based on the actual planned activity.

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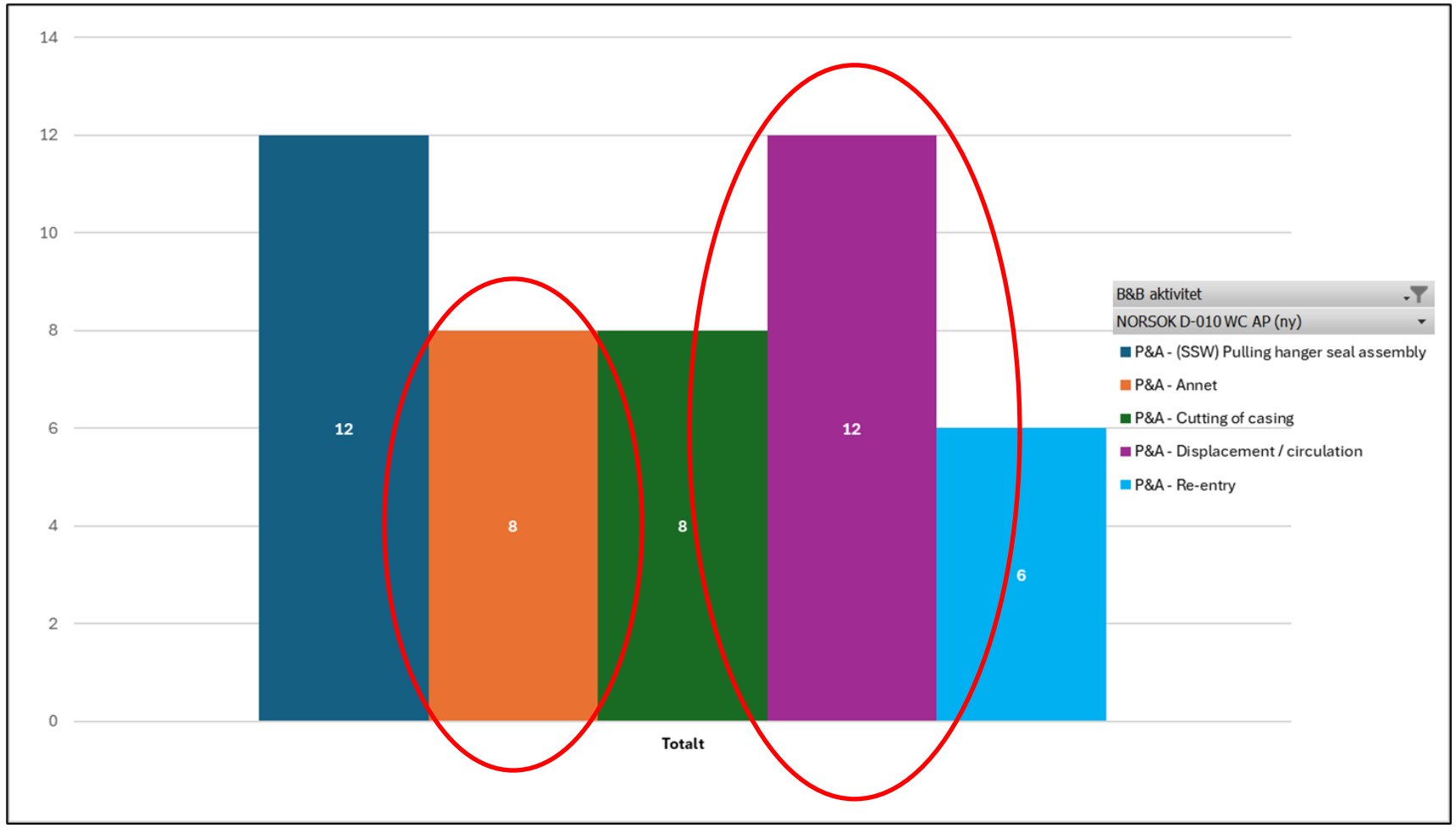
What's behind «Annet/Other»?

Well Control Action Plans



Norsok D-010 Table 23 — Well control action plans P&A , under revision		
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4.	Milling casing	Fluid loss or gain while milling
5.	Perforate and wash operations	Fluid loss or gain while doing perforations and washing operations prior to placing cement
6	Circulation	Gas in return – use of active well control equipment/pressure control equipment to avoid uncontrolled hydrocarbons in return (gas alarm and mustering)

This list is STILL not comprehensive and additional scenarios may be applied based on the actual planned activity.

The Way forward for P&A

Qualification of new technology

Design new wells with P&A in mind

Crossflow and minimum safe abandonment depth

Remediate red and orange temporary abandoned wells

Collaboration & P&A Campaigns

Robust P&A of wells is our legacy for the next generation