SPE well decommissioning conference

4th June 2024

“Norwegian Regulations in Well Decomissioning“

Well Decommissioning & Late Well Life in the Net Zero Era

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Norwegian Ocean Industry Authority
HAVTIL

Havtil Norwegian Ocean Industry Authority

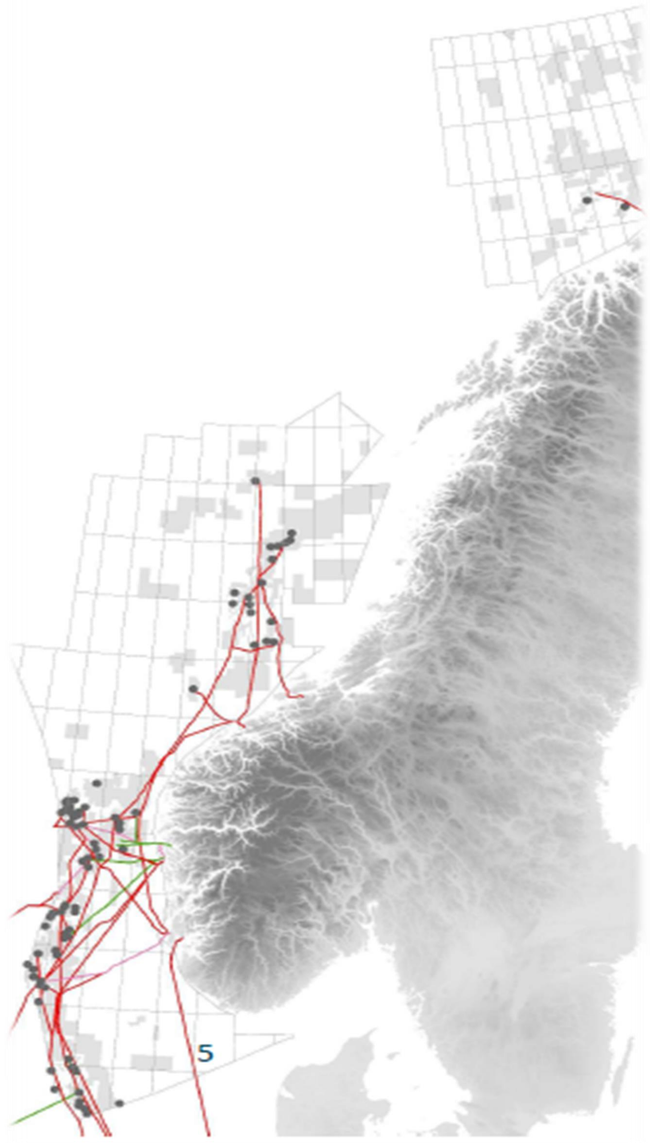
Norwegian Ocean Industry Authority HAVTIL or Havindustritilsynet

- Safety regulator since 1973

- Regulatory responsibility
for safety and the working environment, emergency preparedness and security in Norway's offshore industry

- Reports to the Ministry of Energy

Areas of responsibility



Petroleum operations – offshore and onshore

- 2247 wells
- 92 fields on stream
- 62 fixed facilities
- 40 mobile facilities with an AoC
- 351 subsea facilities
- 25 000 employees offshore
- 17 750 km of pipelines
- 7 onshore plants

Updated 1 January 2024
(Fixed/subsea facilities and pipelines updated 1 January.2023)

New areas of responsibility
Supporting the Parliaments ambitious climate goals and the Energy transition

- **Transport and storage of CO2** (2018)
- **Renewable energy production offshore** (2020)
- **Seabed minerals** (2022)

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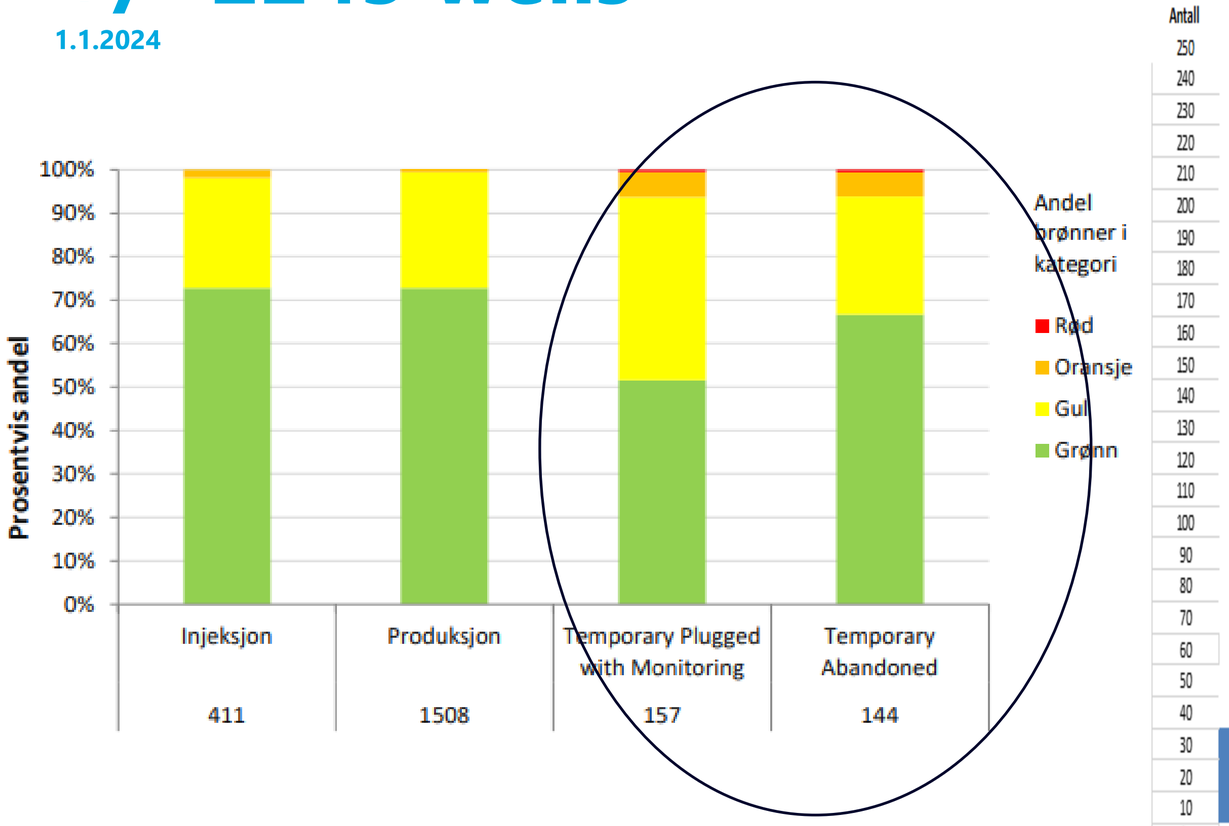
Number of wells NCS January 2024

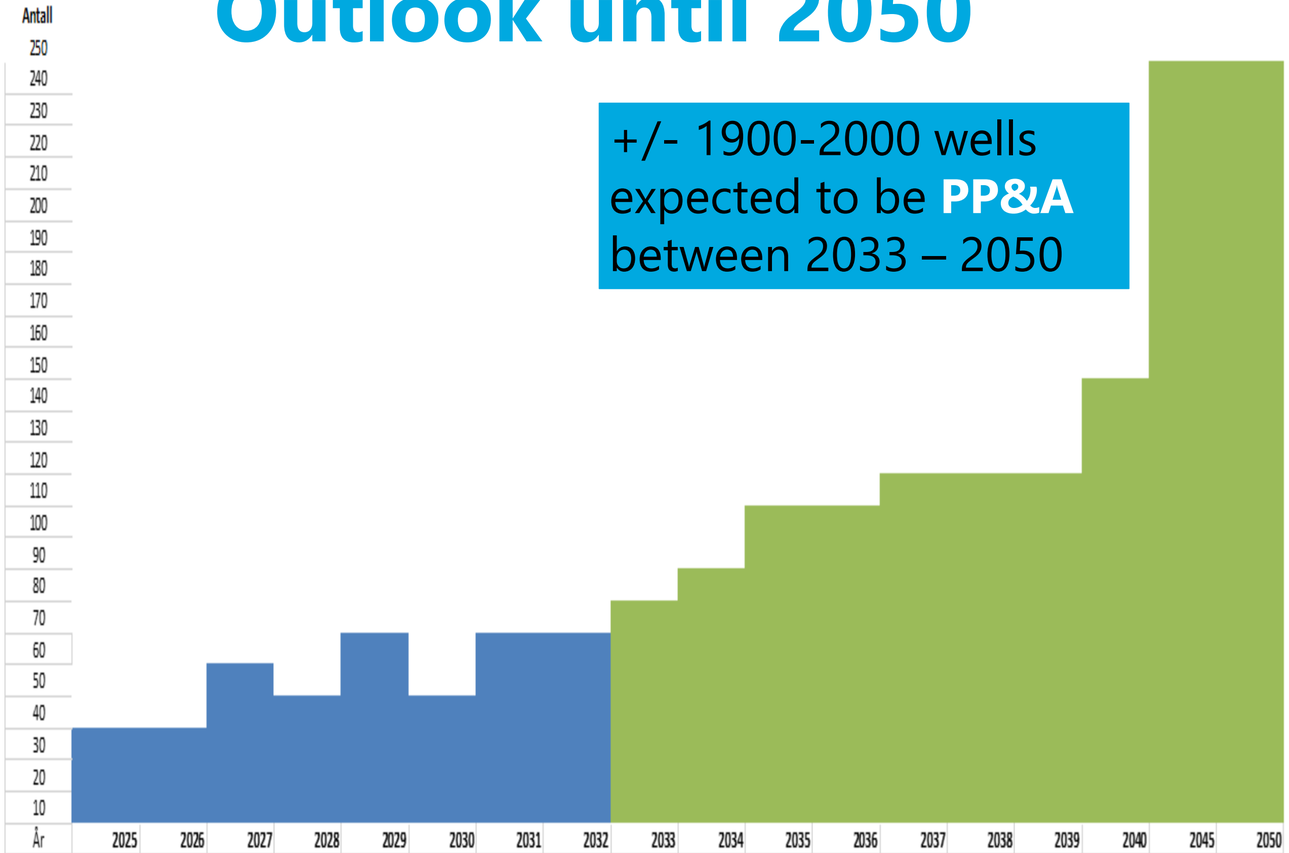
+/- 2245 wells

1.1.2024



Outlook until 2050

+/- 1900-2000 wells expected to be **PP&A** between 2033 – 2050



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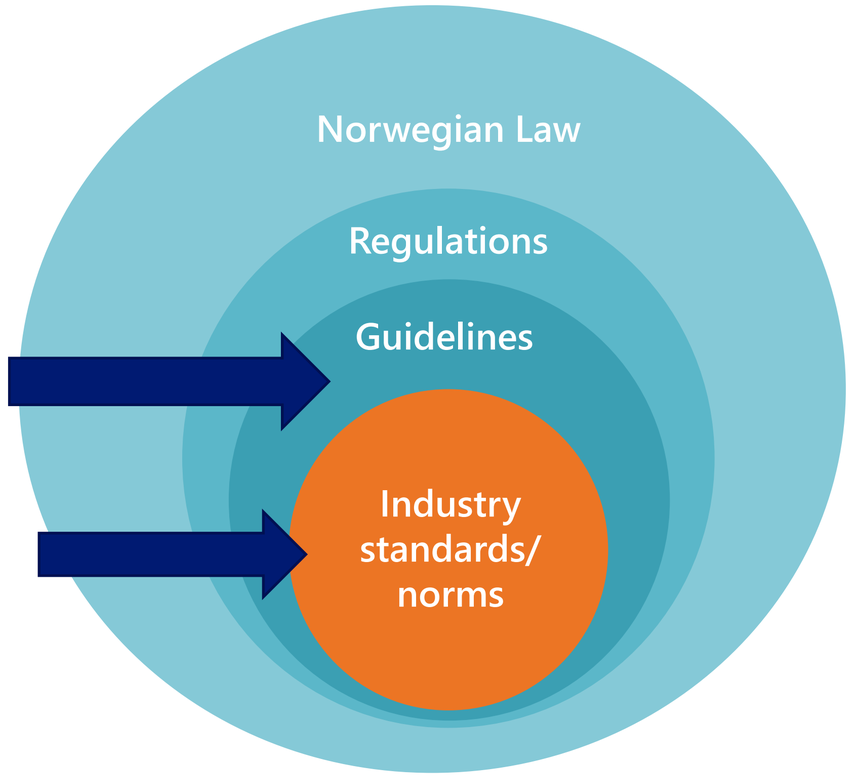
Norwegian regulations underline the allocation of responsibility

- Mainly **Functional Requirements**
- Each company (Operator) is responsible for the safety of its own operations
- Authority to develop regulations and thereby contributing through our **Guidance level** to implement approved policies, norms or standards, e.g. NORSOK D-010 Rev. 5/2021
  - **"Should"** in our Guidance level, means our **recommended way of fulfilling the functional requirement**
  - Alternative solutions with **documented corresponding functionality and quality** (*as good as or equal to*...) can be used



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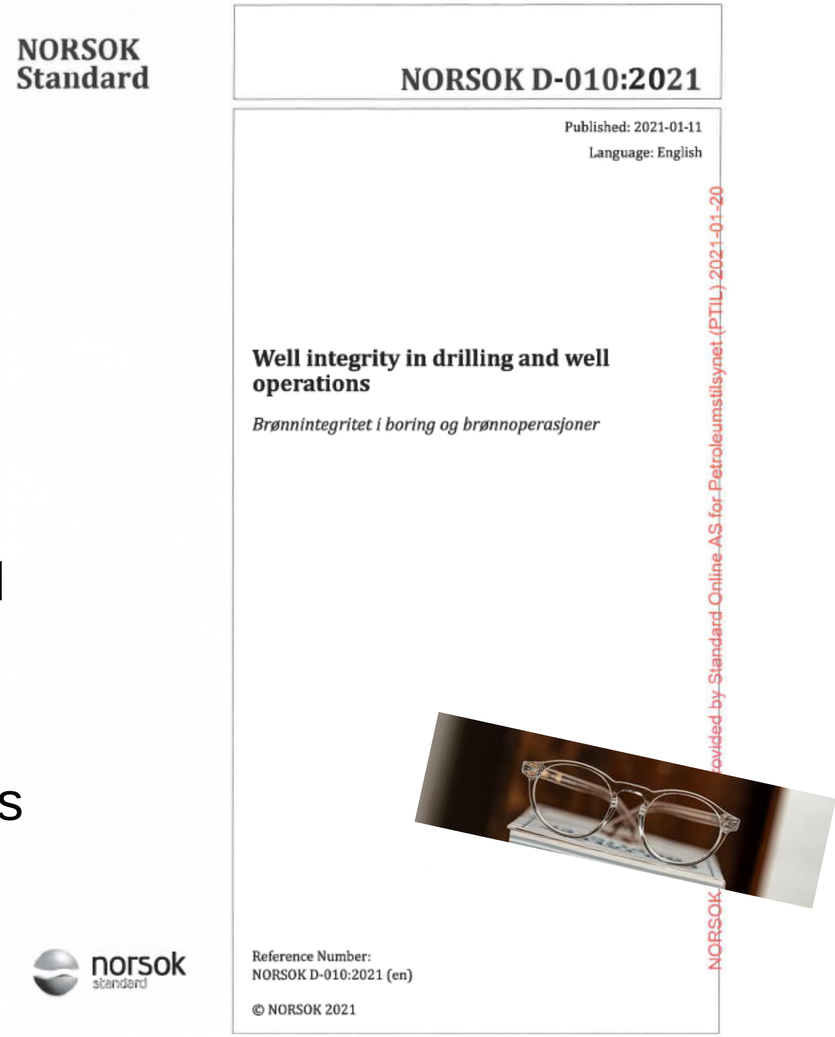
Roadmap to NORSOK D-010 Rev 5/2021

The vision of NORSOK standards:

- be available as references for the authorities' regulations (used in our guidance level);
- be cost effective and promote the Norwegian sector as an attractive area for investments and activities.
  - Focus on establishing well barriers by use of Well Barrier Elements (WBEs), their acceptance criteria, their use and monitoring of integrity during their life cycle.
- WBEAC tables shall be in place for all Well Barrier Elements used
  - includes preparing new EAC's for use of new technology.


NORSOK Standard

NORSOK D-010:2021

Published: 2021-01-11

Language: English

Well integrity in drilling and well operations

Brønnintegritet i boring og brønnoperasjoner

Reference Number:
NORSOK D-010:2021 (en)

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Activity Regulations § 88 Abandonment of wells

All wells shall be secured before they are abandoned so that well integrity is safeguarded during the time they are abandoned.

For subsea-completed wells, well integrity shall be monitored if the plan is to abandon the wells for more than twelve months.

Exploration wells commenced after 1.1.2014 shall not be temporarily abandoned beyond two years.

In production wells abandoned after 1.1.2014, hydrocarbon-bearing zones shall be plugged and abandoned permanently within three years if the well is not continuously monitored.

It shall be possible to check well integrity in the event of reconnection on temporarily abandoned wells.

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Temporary plugged and abandon wells

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

- Bi- annual surveys performed from 2011 with well integrity coding
  - Ref. to Norsok D-010 definitions for temporary abandoned wells
  - Ref. to Offshore Norway guideline 117 for well integrity status

- 2024 survey completed in March 2024 –Quality assurance ongoing
  - Have included production/injection wells that have been shut in for more than 1 year

Temporary abandonment – with monitoring;

Primary and secondary well barriers are continuously monitored and routinely tested. There is no time limit for this modus.

Temporary abandonment – without monitoring;

Primary and secondary well barriers are not continuously monitored nor routinely tested. The abandonment period shall not exceed three (3) years.

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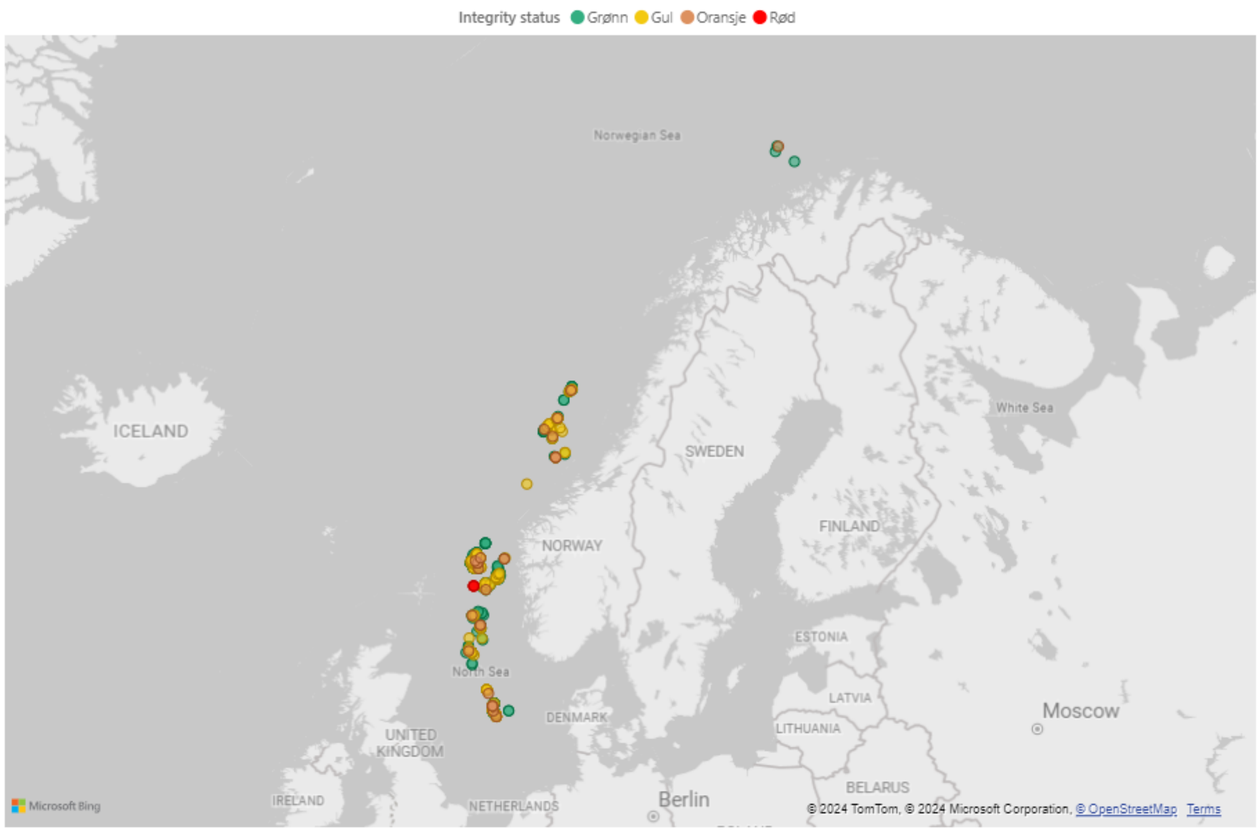
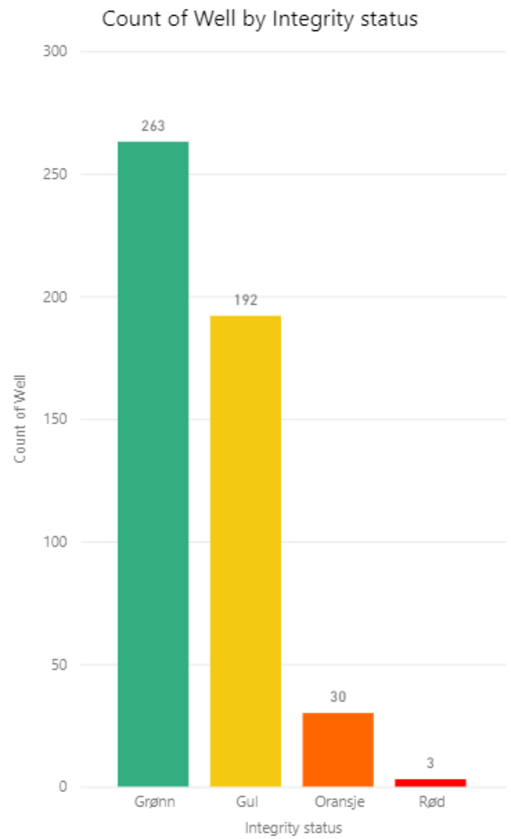
Temporary plugged and abandoned wells- March 2024

About 490 of 2245 wells on NCS are temporary abandoned & inactive wells





CO2 Safety Regulations

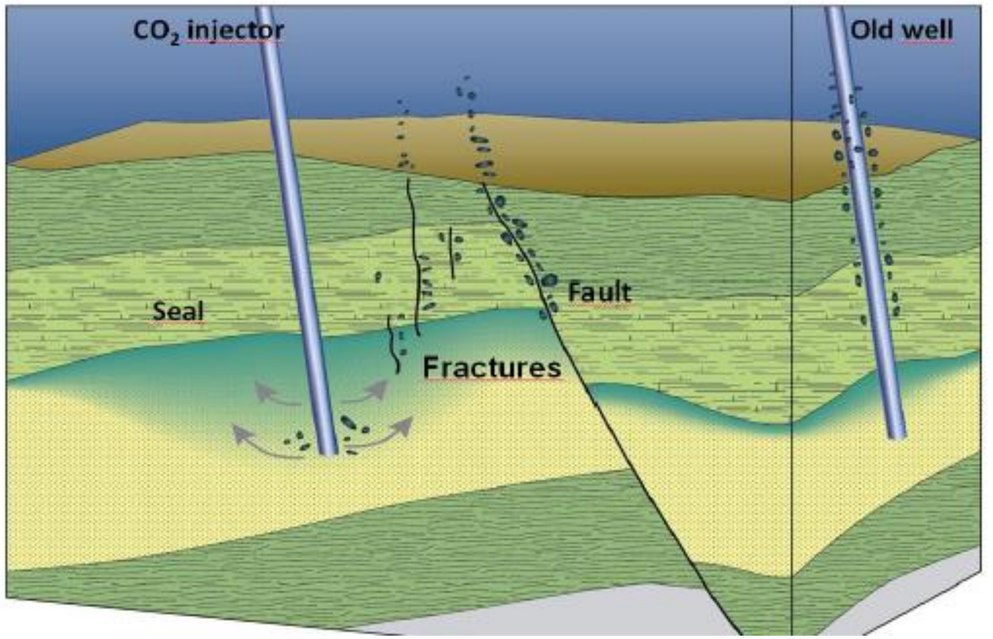
The regulations apply to exploration for and exploitation of subsea reservoirs for storage of CO_2 and transport of CO_2 to such reservoirs
-in areas subject to Norwegian jurisdiction.

SECTION 11

- **The consequences for the well barriers of existing wells in the CO_2 storage complex shall be accounted for.**

GUIDANCE LEVEL

- *By existing wells is meant wells that are in use and temporarily or permanently abandoned wells.*
- *To assess the well barriers to existing wells when storing CO_2, DNVGL-RP-J203 Section 7 and ISO 27914 Chapter 7.6 should be used.*



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Collaboration with other authorities and industry partners is key

NORWEGIAN OFFSHORE DIRECTORATE

Norwegian Environment Agency

HSE

Energistyrelsen

OFFSHORE NORGE

NORCE

Net Zero Technology Centre

Swipa | Subsurface Well Integrity Plugging and Abandonment

otm networks | Delivered by sagentia innovation

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Don’t forget the working environment!

Main issue 2024

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Thanks for your attention!

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