Comparison of HSE Regulations of UKCS & NCS

Well decommissioning & new technology

19th Oct 2023

P&A Forum Stavanger

Grant Moody
HM Principal Inspector of Health & Safety
ED2 Well Engineering & Operations
Health & Safety Executive

Nina Ringøen
Chief Engineer
Drilling & Well Technology
Petroleum Safety Authority

Presentation contents

- Introduction to HSE Regulations in UK and Norway
- Similarities and differences in HSE Regulations
- How HSE & PSA facilitates new technology
- HSE & PSA involvement in qualification of new technology

Similarities and differences HSE UK and PSA Norway

HSE is Great Britain’s national regulator for workplace health and safety.

Regulates non-major hazards and onshore major hazards.

ED regulates:

- Offshore oil and gas & onshore pipelines.
- **Well Eng & Ops,** onshore GB and offshore.
- Net zero activities.
- Diving Ops, onshore, inshore and offshore.
- Mines, Quarries, Wind & Marine Energy.

PSA is the government supervisory agency with regulatory authority for safety, the working environment, emergency preparedness and security offshore and at onshore plants.

The government has transferred responsibility for the PSA from the Ministry of Labour and Social Inclusion to the Ministry of Petroleum and Energy (MPE).

Safety Regulator on the NCS since 1973

Supervision and auditing is part of our mandate

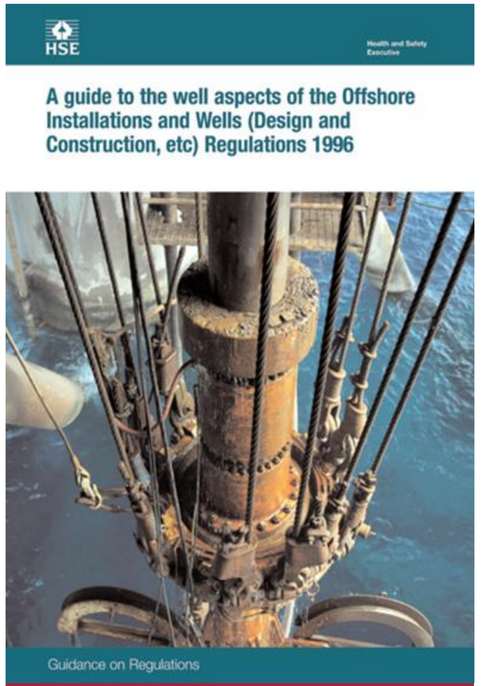
UKCS & GB

Health & safety regulations

Applicable to well operations

Made under the Health & Safety at Work etc. Act 1974

All goal setting, not prescriptive.

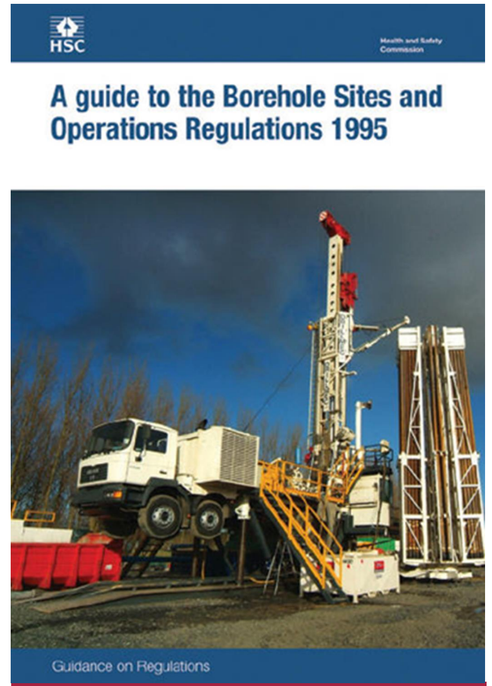


Offshore Installation and Wells (Design and Construction, etc) Regulations 1996 (DCR)

L84

Offshore Installations (Offshore Safety Directive)(Safety Case etc) Regulations 2015 (SCR2015)

L154

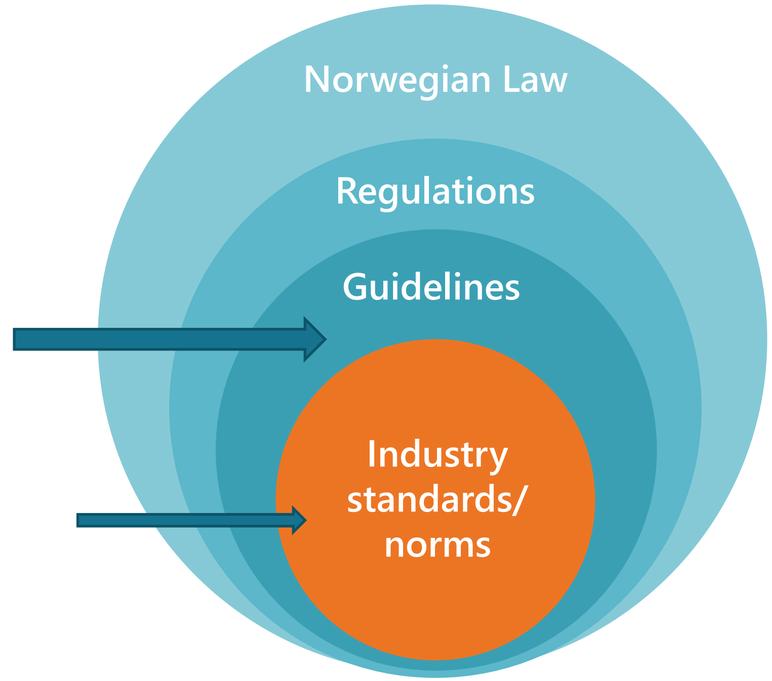


Borehole Sites and Operations Regulations 1995 (BSOR)

L72

Norwegian regulations underline the allocation of responsibility

- Our regulations are mainly **Functional Requirements**
- Each company (Operator) is responsible for the safety of its own operations
- PSA have been given the 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



Similarities and differences UK and Norway Regulations

Goal setting, do not state how that goal is to be achieved.

Reduce risks to health & safety of people to “as low as is reasonably practicable” ALARP.

However, DCR Reg 15 states *“…so far as is reasonably practicable…after its suspensions or abandonment there can be* ***no*** *unplanned escape of fluids from* ***it or*** *from the reservoir to which it led.”*

Regulations are mainly performance based with functional requirements.

Responsible party shall select technical, operational and organisational solutions that reduce the likelihood that harm, errors and hazard and accident situations occur.

Activity regulations section 88 states that all wells shall be secured before they are abandoned so that well integrity is safeguarded during the time they are abandoned (eternity).

Only for health & safety of people, **do not** apply to environmental protection.	Regulations apply to health & safety of people **and** environmental protection.
Regulations do not state number of plugs, placement, testing etc.	Regulations states requirement for <u>barriers</u> with sufficient independence.
OEUK Guidance documents give this information.	Guideline states minimum requirements for permanent well barriers and acceptance criteria according to NORSOK D-010,”Well integrity in drilling and well activities”.
HSE does not grant consent for well operations.	PSA requires consent for well operations on mobile facilities.

No requirement for monitoring of abandoned wells. No prescriptive requirements on well monitoring for suspended wells.

HSE has no prescriptive requirements on time wells can be suspended.

NSTA expects wells to abandoned in a timely manner.

May give consent for initial suspension of 2 years.

Case-by-case basis may extend to a max of 5 years, subject to submission of detailed well P&A strategy.

No requirements for monitoring after permanent abandonment is completed.

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

For subsea-completed wells, well integrity shall be monitored if the temporary well abandonment is greater than twelve months.

From 2014 temporarily abandoned wells shall not be left beyond:

- exploration wells two years
- production wells within three years

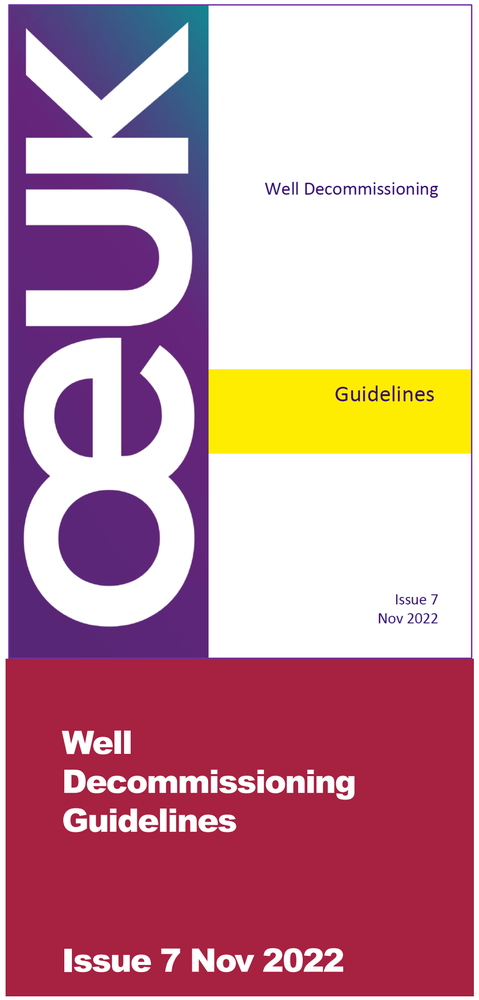
if the well is not continuously monitored.

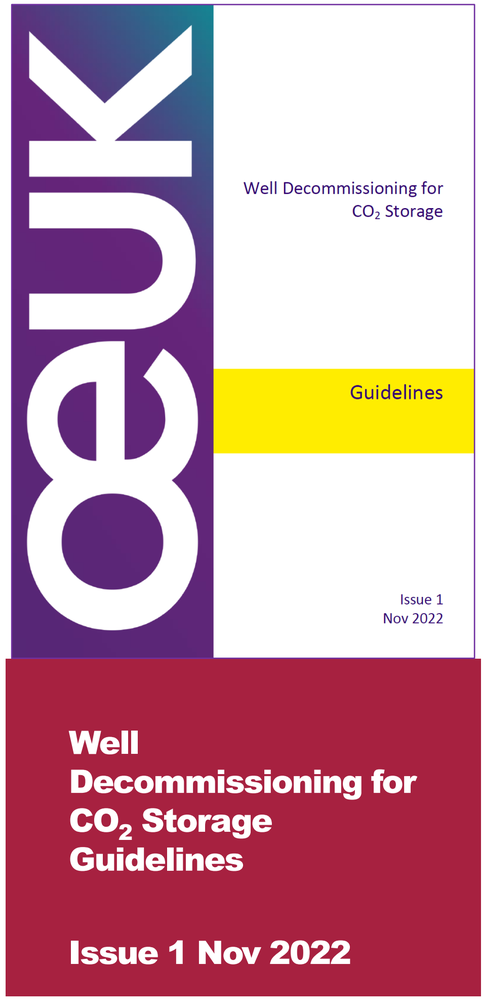
OEUK Guidance publications

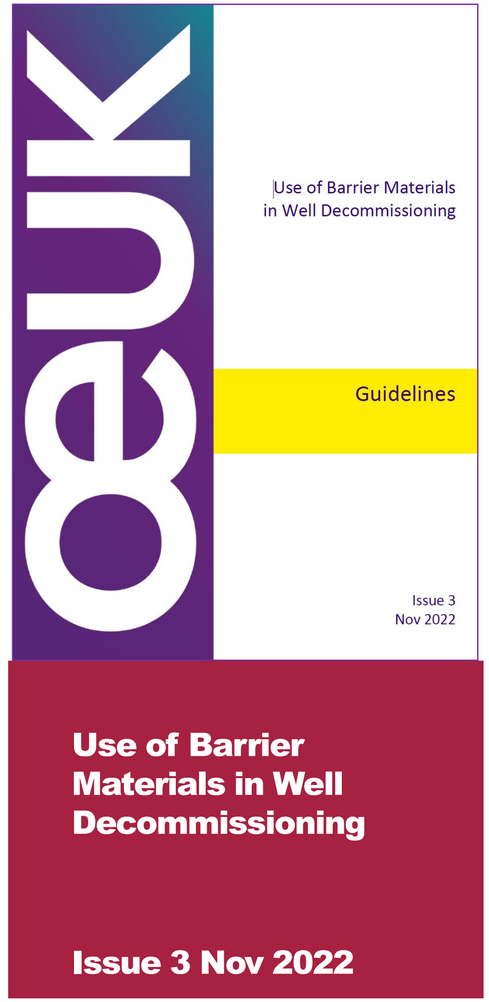
Applicable to well decommissioning

HSE Text in our own publications.

"Following the guidance is not compulsory…, and you are free to take other action. But if you do follow the guidance you will normally be doing enough to comply with the law. Health and safety inspectors seek to secure compliance with the law and may refer to this guidance."



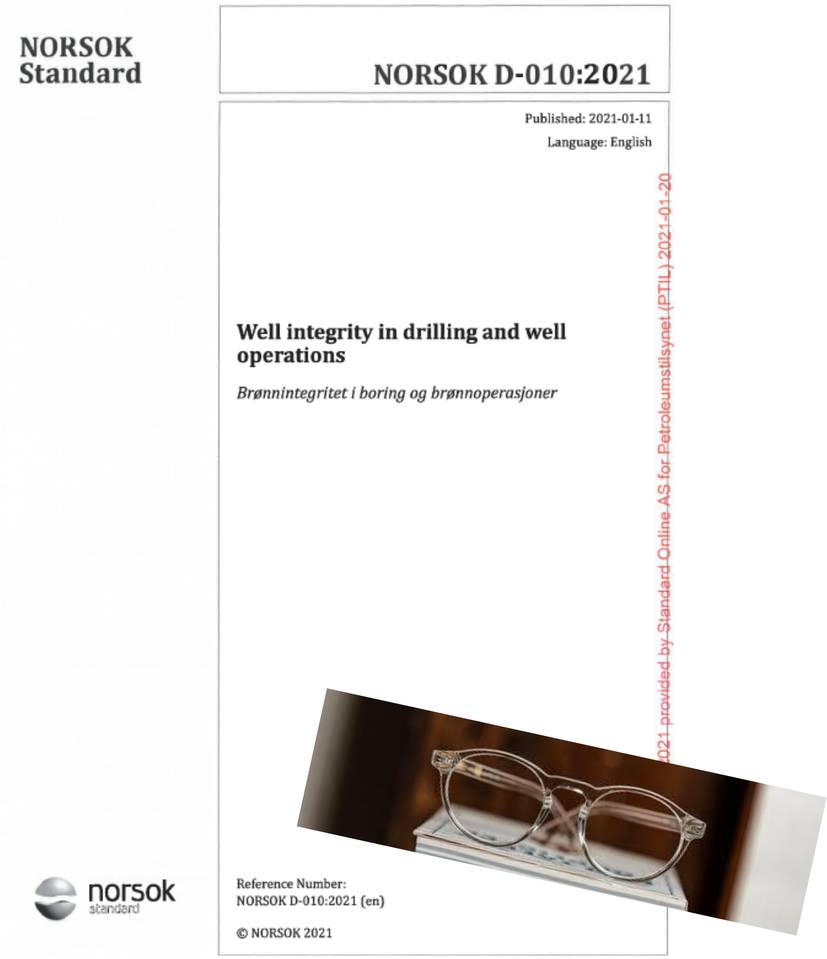




Roadmap to NORSOK D-010 Rev 5/2021

The vision of NORSOK standards:

- be available as references for the authorities' regulations (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.



To qualify as a WBE, a well component shall conform to the acceptance criteria requirements specified in its corresponding EAC table.

- WBEAC table’s shall be in place for all Well Barrier Elements's used (includes new technology).

Guidelines published by a recognised body such as; OEUK, EI, NORSOK are good industry practice and support goal setting regulations.

Compliance with the guidelines is not mandatory. Do provide guidance on what is deemed minimum good practice.

If guidelines not complied with, duty holder must demonstrate work is to an equivalent or higher standard.

Can refer to guidance that is not written for the UKCS; but, require to demonstrate it is equally effective and result in compliance with the law.

Norsok D-010 states minimum requirements for number, size and location of permanent well barriers required.

"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

Documented corresponding functionality refers to a qualification process or similar

Governing regulations, how HSE facilitates new technology

- ❑ Health & Safety at Work etc. Act 1974.
- ❑ Offshore Installation and Wells (Design and Construction, etc) Regulations 1996 (DCR)
- ❑ Offshore Installations (Offshore Safety Directive)(Safety Case etc) Regulations 2015 (SCR2015)
- ❑ Non Major Accident Hazard legislation such as:
  - ➢ The Control of Substances Hazardous to Health (Amendment) Regulations 2003 (COSHH)
  - ➢ The Management of Health and Safety at Work Regulations 1999 (MAW)
  - ➢ The Provision and Use of Work Equipment Regulations 1998 (PUWER)
- ❑ OEUK Guidance “Use of Barrier Materials in Well Decommissioning” Issue 3 Nov 2022 applies and should be followed.

Governing regulations, how PSA facilitates new technology

Facility Regulations § 9

Qualification of new technology and new methods /materials

TRL-process API 17N

New technology as mentioned in the first subsection, may be new products, new materials, analysis tools or known products used in a new way.

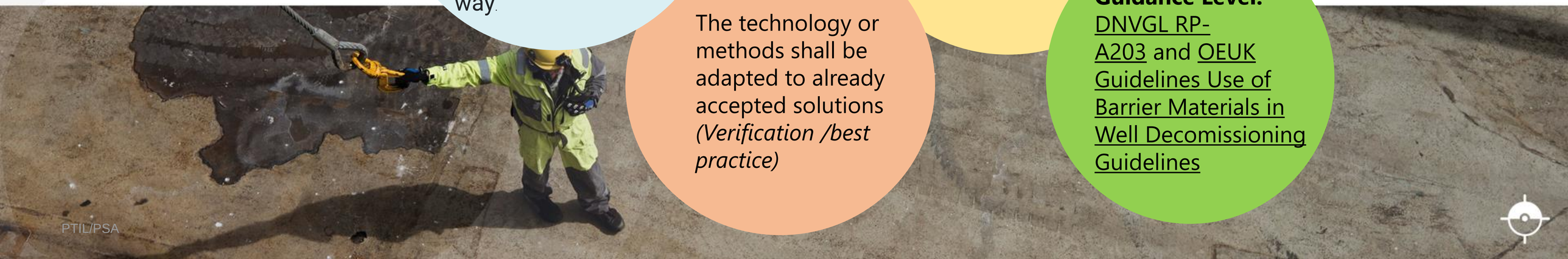
Criteria's shall be drawn up for
- **Development,**
- **Testing and**
- **Use**

The technology or methods shall be adapted to already accepted solutions *(Verification /best practice)*

The qualification or testing shall demonstrate that applicable requirements can be fulfilled.

Includes investigation and obtaining objective proof that the needs for a specific intended use are covered.

Guidance Level:
DNVGL RP-A203 and OEUK Guidelines Use of Barrier Materials in Well Decomissioning Guidelines



Qualification process new technology in UK & Norway

HSE does not approve new technology.

HSE will provide advice to service companies and Well Operators on:

- Requirements to comply with the law.
- Any concerns with new technology.
- How the companies can demonstrate technology is equally effective in well P&A.

HSE would have to prohibit use if:

- Risk of serious personal injury; or,
- Measures preventing or limiting the consequences of a major accident are insufficient to fulfil requirements in regulations.

PSA do not approve new technology.

PSA will provide advice to service companies and Operators on qualification of new technology.

- criteria's shall be drawn up for development, testing and use so requirements for health, safety and the environment are fulfilled.
- Qualification of new technology is also audited according to Operator’s own TRL process
- WBEAC table’s shall be in place for all Well Barrier Element's used (includes new technology).

Enabling use of new technology in UK & Norway

Goal setting regime enables new technology to be implemented. As long as it is safe, risks are ALARP and complies with Relevant Statutory Provisions (RSP’s).

HSE has regular dialogue with NZTC Decommissioning Forum and OEUK Wells Forum.

HSE has provided advice to service companies and Well Operators when requested.

Our functional requirements in the Regulations facilitate the implementation of new technology

Active dialogue with the industry, operators and service companies

Participate in JIP’s, SWIPA’s centre for well integrity & P&A, NORCE P&A Innovation program, guest in PAF and PACE.

Chosen solutions shall give the best possible results in a long-term perspective for HSE (often implemented as a result of more cost-effective solutions)

Enabling use of new technology in UK & Norway

New technology can be trialled onshore GB & offshore UKCS, provided well can be P&A conventionally.

Advice to service companies and Well Operators:

- Engage early with HSE when developing new technology.
- Follow recognised industry guidance on implementing new technology.
- Build a sufficient level of evidence both laboratory based and field tests.
- Can use Non-UK field test results.

The qualification or testing shall demonstrate that applicable requirements can be fulfilled.

Advice to service companies and Well Operators:

- NORSOK D-010 builds on experience with emphasis on establishing a track record, sharing best practice and establishing a qualification matrix in addition to a new EAC for well barrier elements (WBEAC)

Emphasis on limitations of applications (risk based)

As an example operator have clearer guidelines as to when to Perf, Wash & Cement, and when not to PWC (revert to section milling).

Enabling use of new technology in UK & Norway

Not only demonstrate an effective barrier but also:

- How does it satisfy the OEUK material requirements for a permanent barrier?
- How can the system be deployed safely, with repeatability?
- How does the verification method for the system demonstrate it is effective?
- The demonstration is for the complete system not just the downhole sealing material.

Service companies provide Well Op with evidence.

Well Op required to demonstrate it is an equally effective barrier system.

Give the regulators (HSE, OPRED, NSTA) a compelling, evidence-based demonstration.

The qualification or testing shall demonstrate that applicable regulatory requirements can be fulfilled.

- Includes investigation and obtaining objective proof that the needs for a specific intended use are covered.

Establish track record

- A track record is qualified by a minimum of three (3) successful operations, using the same conditions/ parameter set.

Establish a Qualification Matrix

- set of critical parameters/ criteria that are determined during the process of establishing a successful track record, and that need to be fully adhered to and fulfilled in order to expect a successful outcome

Understand the UK regime

Contact HSE UK

[Offshore oil and gas - HSE]

[HSE Offshore: Wells]

[Offshore Major Accident Regulator (OMAR) - HSE]

Understand the Norwegian regime

Contact PSA Norway

[www.psa.no]

[Main issue 2023: for safe and stable energy development – collectively and concurrently]

[RNNP explained]

[How is supervision conducted?]