PETROLEUM SAFETY AUTHORITY NORWAY

HF and digitalization

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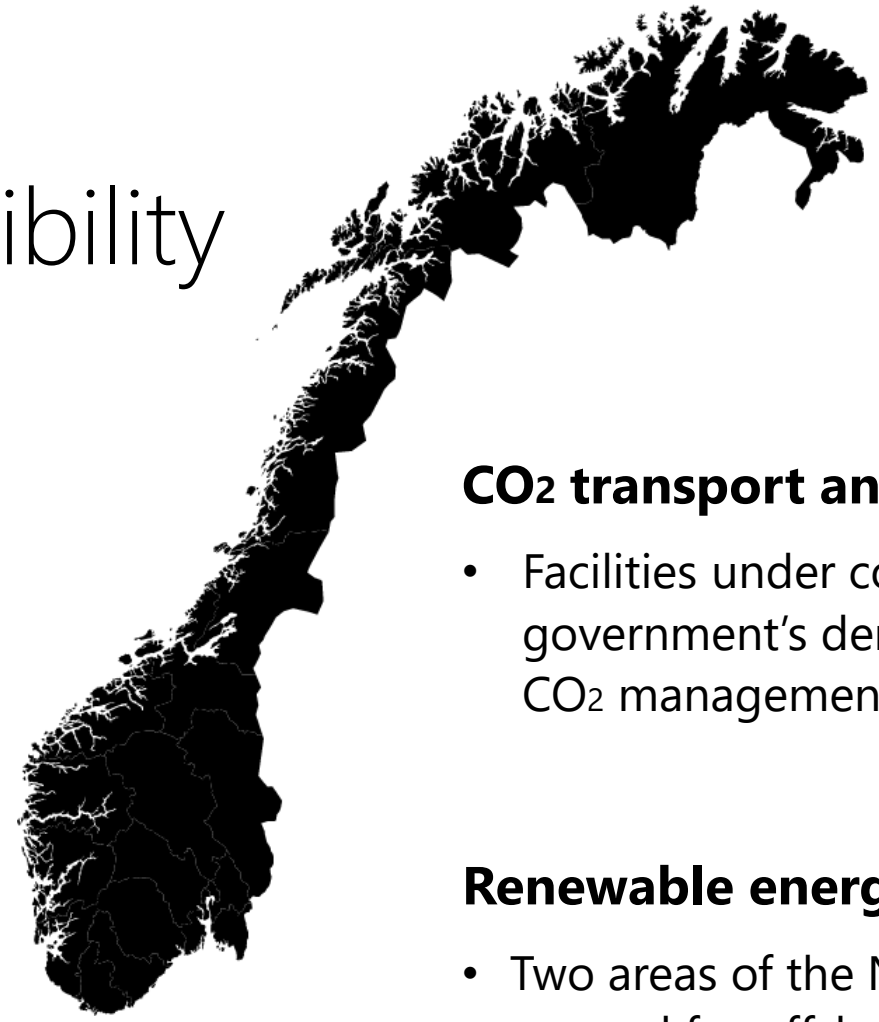
Our duties

- **Develop and adopt regulations**
- **Supervise the companies**
- **Develop, manage and communicate expertise**
- **Serve as the specialist agency for our area – towards the industry, other state agencies and the general public**
- **Provide specialist advice to the ministry**

Areas of responsibility



Petroleum operations

- 94 fields on stream
- 85 fixed facilities
- 49 mobile facilities with an AoC
- 342 subsea facilities
- 25 000 employees offshore
- 17 400 kilometres of pipeline

Updated 1 January 2022

CO_2 transport and injection

- Facilities under construction. Part of Longship, the government's demonstration project for full-scale CO_2 management

Renewable energy production offshore

- Two areas of the Norwegian continental shelf opened for offshore wind power: Utsira North and Southern North Sea II

MAIN ISSUE 2022

Capacity and competence – the key to safety

PETROLEUMSTILSYNET

Supervision, knowledge reports and collaboration

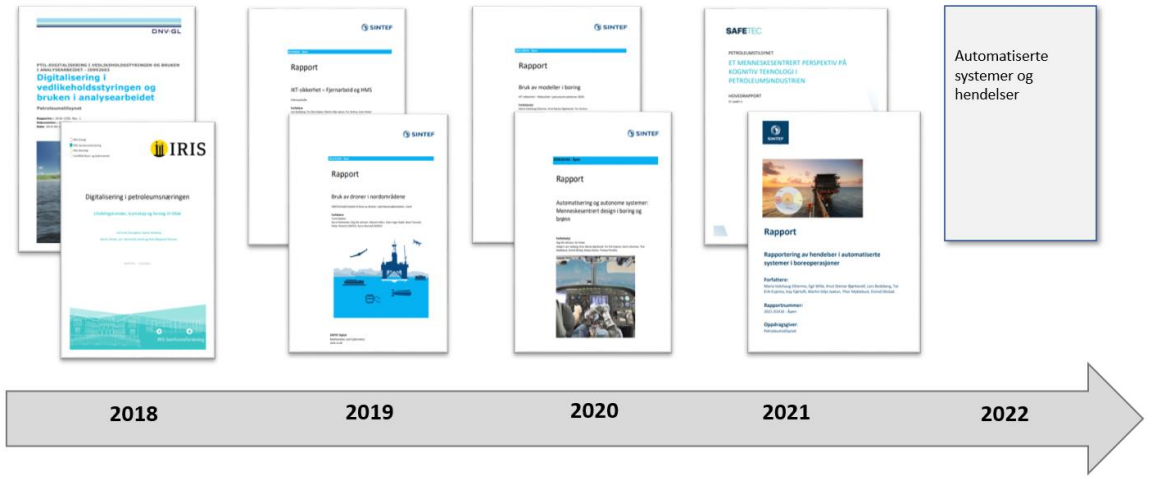
Use of digital well planning, automated drilling and digital twin.

New contracts and forms for collaborating

Simpler installations and design of control rooms, including alarm management

Remote and automated inspection - and detection systems

Audits



International Regulators' Forum
GLOBAL OFFSHORE SAFETY

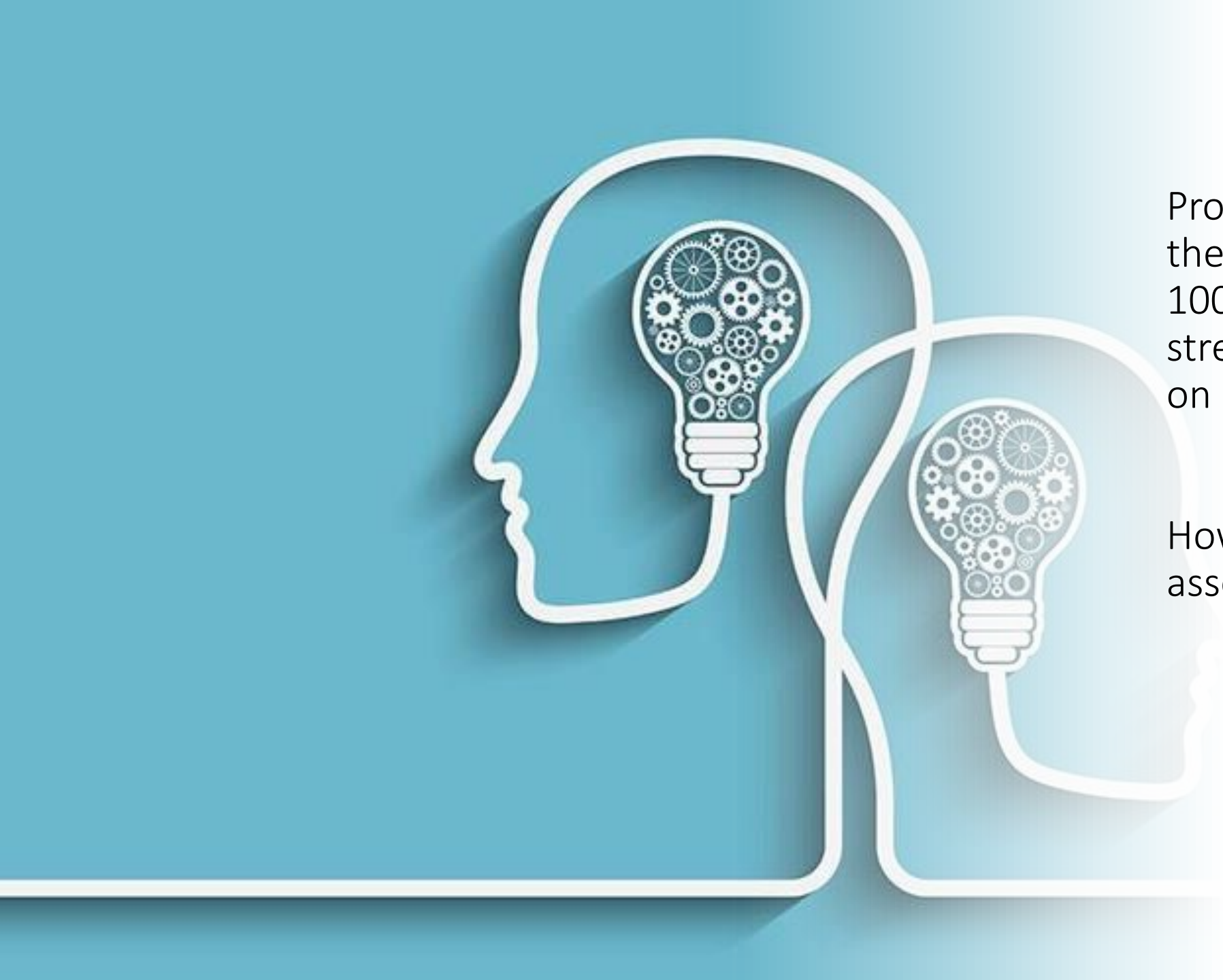
Sikkerhetsforum

Gaps between the properties of the technology and operator can contribute to incidents.

- Complexity and weaknesses in the design may lead to loss of situational awareness and ability to execute necessary actions
- Appropriate use of technology depends on specific training and experience

How are human preconditions addressed in technology development and technology qualification?

The Facilities Regulations § 9 Qualification and use of new technology and new methods
The Facilities Regulations § 10 Installations, systems and equipment
The Facilities Regulations § 21 Human-machine interface and information presentation



Product development while at the same time operating at 100% . Can contribute to stress and reduced attention on primary operation

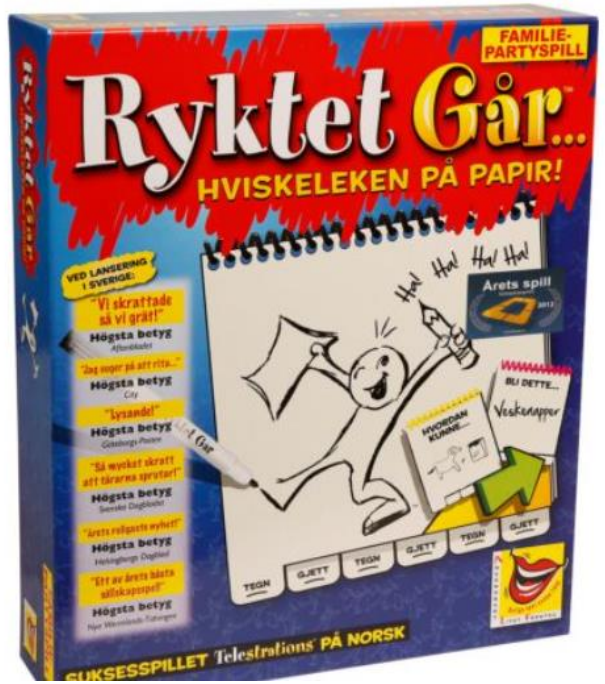
How is operational risk assessed and follow-up?

The Management regulations § 18 Working environment analysis
The Activities Regulations § 33 Organisation of work
The Activities Regulations § 35 Psychosocial aspects

High rate of change and ambitious goals.

Are work processes and technology aligned?

The Management Regulations § 13 Work processes
The Activities Regulations § 29 Planning



Increased degree of distributed organizations – resulting in increased interfaces and complexity. Failure in information transfer between locations, people and technology may contribute to incidents

How are challenges related to information failure between locations and personnel adequately understood and followed up?

The Management Regulations § 15 Information
The Management Regulations § 14 Manning and competence
The Activities Regulations§ 31 Monitoring and control

Technology provides an increased opportunity to measure performance. However, the focus, scope and level of reporting can contribute to increased time pressure and negatively affect human performance.

Misleading indicators?

The Management regulations § 10 Measurement parameters and indicators




Industry-specific knowledge and experience

Dependence on human capacity for change - Competence boost on several fronts

Do we as HF experts work with the right professional groups?

- Leaders
- Personnel / End-users
- Safety delegates and union representatives
- Developers / designers

What knowledge and competence do the various target groups need?

Are we as HF experts in the right arenas?

Do we have a customized message for the various target groups?

How can we our expertise to secure optimal system performence.

How are interdisciplinary teams involved in development and follow-up?

In short
– what do we follow-up?

- HSE goals established as a basis for an iterative design process and the validation of the solutions
- Knowledge and competence on human possibilities and limitations applied in development, qualification and operation
- Challenges related to distributed organizations understood and managed
- Work processes and technology aligned when implementing new technology
- Expertise on major accident risk involved continuously in the projects and before the solutions are implemented

PSAs goal is to follow-up that the petroleum activity gives high priority to HSE when digital technology is developed, assessed and implemented in companies.

Our regulations

Regulations	
The management regulations	§4 Risk reduction §13 Work processes §16 General requirements for analyses §18 Working environment analysis §29 Notification and reporting of hazard and accident situations to the supervisory authorities
The facilities regulations	§ 9 Qualification and use of new technology and new methods §10 Installations, systems and equipment §20 Ergonomic design §21 Human-machine interface and information presentation §34a Control and monitoring system
The activities regulations	§21 Competence §31 Control and monitoring system §33 Organisation of work §34 & §35 Ergonomic aspects & Psychosocial aspects

What are your experiences?

PETROLEUM SAFETY AUTHORITY NORWAY

Kunnskapsrapporter

Digitalisering i petroleumsnæringen (2018)

Automatisering og Autonome Systemer: Menneske – maskin grensenitt (2020)

Bruk av modeller i boring (2020)

Fjernarbeid og HMS (2018 & 2019)

Digitalisering i vedlikeholdsstyringen og bruken i analysearbeidet (2018)

Et menneskesentrert perspektiv på kognitiv tekologi i petroleumsindustrien (2021)

Rapportering av hendelser i automatiserte boresystemer (2021)

IKT Sikkerhet og digitalisering

Video og artikler

Ny teknologi må ta hensyn til menneskene

Digitalisering - prioritert tema for IRF

HMS-effekter av digitalisering

Klare krav til digitalisering

Den digitale oljearbeider (video)

Thank you!