«Digitalization in the petroleum industry»

Presentation HFC

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22. OKTOBER 2018

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Project commissioned by the Petroleum Safety Authority (PSA)

http://www.iris.no/home/ny-rapport-om-hms-effekter-av-digitalisering

› Mapping trends in digitalization, consequences for health, safety and environment (HSE) and work organization, recommendations for measures

› Cooperation with PSAs project group and consultative group

› Systematic literature review

› Gathering experiences from the petroleum industry and supervision:

  • Interviews with about 30 actors from industry and experts

  • Group interviews and individual interviews

› Workshops with different participant groups and themes

› Report published March 2018

Content of the report and presentation

o Digitalization trends, technology and risk in the petroleum industry

o Supervision, regulation and standardization

o Work organization and HSE

o Worker involvement and tripartite system of collaboration

o Suggestions for measures for the industry and focus areas for the supervising authority

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Technology and digitalization trends in the petroleum industry

Drivers

- Increased focus on costs and efficiency focus
- Technological possibilities - The fourth industrial revolution
- National initiatives and strategic guidelines focusing on digitalization (OG21, KonKraft, corporate strategies)

Categories for digitalization initiatives

- Robots and autonomous vessels
- Automation of drilling operations
- Integrated operations
- The digital oilfield

Perspectives from the industry

› Digitalization and automation are considered critical tools to remain competitive

› Digitalization is the technology area in which the industry expects the greatest investment in 2017, and increasing investments over the next 3-5 years

  • Large companies are most willing to digitalize

  • Today, mobile technology and Internet of things (IoT), the next few years, Big Data, Analysis and IoT become the most important

› Main barriers to digitalization are old-fashioned corporate culture, lack of knowledge among senior staff, lack of expertise and bureaucratic obstacles

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Technology and risk

N◌RCE

Digitalization -> Increased complexity

› Management of complex systems has been a focus area for years

› Reliability and risk assessments have become increasingly challenging

› Our dependence on (and the vulnerability of) digital systems is constantly increasing

› Increased demands of users (skills) and decision makers

› Digitalization -> increased focus on systemic risk

› Effective management and analysis of data, eg., methods for dynamic analysis of risk with real-time data

› Effective communication and visualization (risk picture)

› A need for an upgrade of skills/competence in fields such as ICT/cybersecurity, artificial intelligence, cybernetics and legal frameworks related to digitalization

Work organization and HSE: Knowledge status and experiences

NORCE

- What consequences can digitalization of the petroleum industry have for work organization and HSE?
- Will it be safer or more risky to work in the industry?
- Will the risk of minor or major accidents increase?

Consequences of digitalization for work organization
– **human aspects**

NORCE

1. Change of content and form of work
2. Trust in technology
3. Alienation
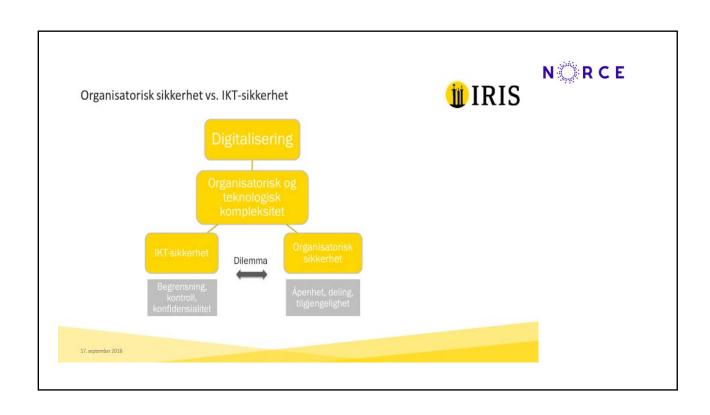4. Knowledge and digital competence
5. Uncertainty and resistance to change

Consequences of digitalization for work organization
– **organizational aspects**

N◉RCE

1. Moving tasks and employees from ocean to land
2. Collaboration and communication
3. Complexity and adaptability
4. Anchoring of digitalization initiatives in the organization
5. Barriers to technology adoption and organizational changes
6. Change of roles, structure and responsibilities

Organisatorisk sikkerhet vs. IKT-sikkerhet

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Digitalisering

Organisatorisk og teknologisk kompleksitet

IKT-sikkerhet   Dilemma   Organisatorisk sikkerhet

Begrensning, kontroll, konfidensialitet   Åpenhet, deling, tilgjengelighet

17. september 2018

Challenges for worker involvement and the tripartite system of collaboration

- Successful digitalization requires worker involvement
- Digitalization challenges the tripartite system of collaboration
- New groups of employees: from "roughneck to knowledge worker»
- Power shifts between unions
- New forms of work and forms of employment
- More workers will disappear from PSA's area of responsibility
- A risk that some groups will not have the opportunity to take part or influence decisions
- Losing a stable workforce
- Challenge: integrate new employee groups into HSE work and the tripartite system of collaboration

DIGITALISERINGEN I ANSATTES ØYNE

Vellykket digitalisering krever involvering. Digitaliseringen utfordrer partssamarbeidet, og nettopp derfor vil det være avgjørende at alle parter er engasjerte og bidrar.

Suggestions for measures and further work

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- › ICT/cybersecurity and need for information flow
- › Digital competence
- › Sociotechnical perspective on technology development and HSE
- › Interorganizational safety/security culture
- › Unions and/or safety representatives
- › Holistic focus in the industry. Horizontal cooperation between actors

TILTAK

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