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Safety and working environment

The NCS and the Norwegian petroleum industry compete in global markets. To stay competitive the industry needs to become more cost-efficient, successfully explore and develop new resources, reduce lead times, and significantly reduce GHG emissions as discussed in Section 3. But at the same time, a high safety level must be achieved to maintain support in the society.

The strive for improved competitiveness for a maturing oil province as the NCS introduces safety risks that must be managed, e.g.:

- An aging infrastructure which requires more inspection and maintenance.
- New inspection and maintenance philosophies and technologies.
- New digital technologies like remote operations and autonomy.
- New low-carbon technologies and energy carriers like hydrogen and ammonia.
- A changing operator landscape with fewer large international companies and more medium sized and small independent oil companies.
- New business models and contract models where contractors and suppliers are integrated with operators.
- Increased integration of digital systems and technologies that could render the systems more vulnerable to cyber security threats.

These risks have been the considered when TG5 has prioritized technology and knowledge areas. The prioritized technology and knowledge areas for TG5 are:

- Consequences and opportunities from adoption of new technologies.
- Consequences and opportunities of new business models.
- Major accidents: Improved understanding of risks and uncertainty.
- Improved working environment.
- Cyber security as an enabler for digitalization.

An important principle on the NCS is that changes shall provide at least the same level of safety as prior to the changes. Understanding the safety and working environment consequences of introducing new technology is hence important. We need an improved understanding as well as improved safety risk management of the potential safety and working environment hazards of all types of new technologies being considered for implementation. This includes the technology needs identified by the other OG21 Technology Groups.

The same principle also applies to organizational and structural changes. It is therefore important to improve the understanding of how the changing NCS operator landscape as well as new collaboration models such as strategic alliances between operators, suppliers, and service providers, influence safety and the working environment.

Petroleum operations involve safety risks. The industry works continuously to identify hazards, and understand, reduce, and mitigate risks. To improve, the industry needs to further develop the understanding of risks including how to manage the inherent uncertainty that risks are associated with. This particularly applies to major accident risks. Improvement areas include for instance better integration of human factors in risk management tools, and improved systems for learning from the past.

The precautionary principle should be applied when the consequences of activities are uncertain or unknown. There is a continued need to better understand the physical, chemical, social, or the psychological work environment of ongoing activities. Likewise, such working environment factors should be investigated also when new technology and new work processes are implemented.

The cyber-security area addresses an imminent and rapidly increasing threat to the industry. The industry is progressively making use of digital solutions in numerous new areas. As new digital technologies are implemented and industrial operational systems are becoming more integrated with other information technology systems in enterprises, the design and management of barriers becomes more complex. There is a need to better understand safety implications of new infrastructure complexities and threats, as well as the vulnerability of data and applications. Furthermore, it's important to strengthen the national cyber security competence and the situational awareness on such issues in the Norwegian petroleum industry. The industry is dependent upon a digital transformation to stay competitive, and managing cyber-security threats efficiently, is fundamental to this transformation. In this context it should also be noted that improved management of information and communication technology (ICT) security has a potential large transfer value to other disciplines.

CASE - TG5

DNV Safety 4.0 project

Safety and working environment - Prioritized technology areas

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