The Arctic 2019-project

Comparative analysis of the use by various authorities of standards as normative instruments to further safety in offshore petroleum operations in the Arctic

Report from Advokatfirmaet Simonsen Vogt Wiig AS
to the Petroleum Safety Authority Norway, 16 December 2019

English translation

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Content

Abbreviations:

ACAP - Arctic Contaminants Action Program

ANSI - the American National Standards Institute

AORF - Arctic Offshore Regulators Forum

APA - Administrative Procedure Act

APD – Application for Permit to Drill

API – American Petroleum Institute

ASME - the American Society of Mechanical Engineers

ASTM - the American Society for Testing and Materials

BAST - Best Available and Safest Technology

BOEM - Bureau of Ocean Energy Management

BSEE - Bureau of Safety and Environmental Enforcement

CEN – European Committee for Standardization

CER – Canadian Energy Regulator

CFR - Code of Federal Regulations

CIRNAC - Crown-Indigenous Relations and Northern Affairs Canada

CLC – Canada Labour Code

COGOA - Canada Oil and Gas Operations Act

CSA - Canadian Standards Association

DNV – Det norske Veritas

EEA – European Economic Area

EPPR - Emergency Prevention Preparedness and Response

EU – European Union

FLNG – Floating Liquid Natural Gas

FORRI - Frontier and Offshore Regulatory Renewal Initiative

HES/HSE –Health, Environment and Safety/Health, Safety and Environment

ICRARD - International Committee of Regulatory Research and Development

ILO – International Labour Organisation

IMO - International Maritime Organisation

IOP - Integrated Operations Plan

ISO - International Organization for Standardization

NEB - National Energy Board

NEPA - the National Environmental Policy Act

NGL – Natural Gas Liquids

NORSOK – NORwegian Shelf Competitive position (standards)

NOSAF - North Sea Offshore Authorities Forum

NRCan - Natural Resource Canada

OCS – Outer Continental Shelf

OGOA - Northwest Territories Oil and Gas Operations Act

OGP - International Association of Oil & Gas Producers

OORP - Office of Offshore Regulatory Programs

OPA 90 - the Oil Pollution Act of 1990

OSCLA - the Outer Continental Shelf Lands Act

OSPAR – Convention on the protection of the marine environment in the North-Eastern Atlantic of 1992

OSRP - Oil Spill Response Plans

PAME - Protection of the Arctic Marine Environment Working Group

SAR – Search and Rescue

SDO - standard developing organisations

SVW – Advokatfirmaet Simonsen Vogt Wiig AS

UN – United Nations

UNCLOS - United Nations Convention on the Law of the Sea

USCG – U.S. Coast Guard

1 Project description

1.1 About the report

The work leading up to and in connection with this report is connected to activities carried out by the Petroleum Safety Authority Norway as part of the program "*Arctic 2030 - the Ministry of Foreign Affairs' project cooperation in the northern areas*". The planning, preparation, and implementation of the work presented in this report is partly funded by the Ministry of Foreign Affairs through the "*Arctic - 2030 program*". In addition, the Petroleum Safety Authority Norway finances parts of the project with its own funds.

The framework for and objectives of the Petroleum Safety Authority Norway's project are set out in the "project application # 11480 *Regulation and standardisation of Arctic petroleum activity".*

In order to carry out legal mapping and base analysis, the Petroleum Safety Authority Norway has sought external assistance. According to the award, under a framework agreement, pursuant to public tendering, Advokatfirmaet Simonsen Vogt Wiig AS ("SVW") was engaged. This report is a summary of the work carried out by SVW under the Petroleum Safety Authority Norway's call off no. 06636-03-19, dated 25 March 2019.

The title for the assignment was:

> *"Legal assistance to the project: 'Arctic petroleum activities - HSE regulation and standardisation' - 2019 project".*

The assignment represents a continuation of previously carried out mapping and initial analyses. The previous work had also been carried out by SVW under a separate call off pursuant to the same framework agreement with the Petroleum Safety Authority Norway.

In the call off from the Petroleum Safety Authority Norway, the work description is linked to previously performed activities as follows:

> *"Request for legal services in order to carry out the project as described in the attached project description. The project is based on project application # 11480 Regulation and standardization of Arctic petroleum activity, and extends the call-offs dated October 22, 2018 and January 17, 2019 under the framework agreement."*

The call off also included the "*Project description 'Arctic petroleum activities - HSE - regulation and standardization' - 2019 project*" ("the Project Description").

SVWs' lawyers, with Bjørn-Erik Leerberg as the partner in charge, and with significant contributions from Frode A. Berntsen and Børge Alsvik, have prepared the report. In addition, the paralegal Elaine Z. Aarkvisla has contributed administratively.

The [original] report was prepared in Norwegian, but all quotations from English-language sources [were] retained in their original language [in the Norwegian version].

The preparation of the Questionnaire was, of course, not prepared in Norwegian as the document was intended be distributed to the competent authorities in various foreign countries. When a final report is available, [the intention was that a summary would be prepared in English once the original Norwegian language version had been finalized, but it was decided to translate the entire report instead.]
All foreign partners and contributors were informed that the work and the report are subject to the Act 19 May 2006 no. 16 relating to the right of access to documents held by public authorities and public

undertakings (Freedom of information Act). The partners are thus informed that received information, forming the basis for and included, as material for the report, subject to request for access, may be made publicly available with such limitations as provided by law.

1.2 Objectives of the Project

The project description from the Petroleum Safety Authority Norway specifies the objectives of the project as follows:

- Increase the knowledge base on HSE-regulation and in particular the use of standards in relation to petroleum operations in the Arctic.
- Increase awareness on the regulation of HSE in the Arctic
- Establish and strengthen cooperation among authorities responsible for HSE in the Arctic
- Contribute to strengthening the presence within Norwegian areas of interest such as international cooperation, knowledge and environment, safety and emergency preparedness within the Petroleum Safety Authority Norway area of responsibility

1.3 Overall methodological approach

The Report is based on Norwegian legal methodology; Norwegian law is not addressed as such. Given the considerable differences in legal tradition and administrative structure in several of the jurisdictions concerned, it has been a key point that the analysis and report are based on input and assessments obtained from representatives of authorities in participating countries.

To the extent SVW has assessed the foreign regulations obtained from publicly available sources, SVW has mainly relied on primary – and secondary formal legislation, as well as any legislation or industry-based standards to which such regulation refer. Notices, circular letters, guidelines, instructions or similar have not been collected or reviewed. To the extent respondents have referred to guidelines, SVW has assumed that this expresses applicable rules.

In line with the Project Description, SVW has sought to carry out a comparative analysis between the jurisdictions' use of standards as a normative instrument for regulating Artic petroleum operations Arctic before the report was compiled, we have had to settle for only providing some overall observations. No independent, legal analysis of feedback received has been carried out to follow-up the Questionnaire or otherwise.

The scope of the report is defined by the Petroleum Safety Authority Norway's offshore petroleum activities regulatory HSE responsibility in accordance with Norwegian law and administrative practice. The scope and delimitations are outlined in 1.7 below.

1.4 Arctic Offshore Regulators Forum

The "*Arctic 2019 project*" must be seen in the context of the Petroleum Safety Authority Norway's participation in international cooperation. The project represents a continuance of previous multilateral Artic cooperation activities.

The Arctic Offshore Regulators Forum ("AORF") is a forum for and cooperation between authorities responsible for Arctic regulatory development and enforcement within the petroleum sector. The purpose of the collaboration is stated in the AOFR articles of incorporation[1]:

[1] https://www.ptil.no/contentassets/231cfe4970d84a37aba26daf64b30e84/aorf-terms-of-reference-final-may-2015.pdf

> *"**Article II. Purpose and Policy***
>
> *1. Definition*
> *(a) The AORF is an Arctic forum of technical and operational offshore petroleum safety regulators whose members are dedicated to the common cause of continually improving offshore safety outcomes. The primary scope will be an exchange of information, best practices and relevant experiences learned from regulatory efforts related to developing petroleum resources in the Arctic regions of the globe. Topics addressed by the group may expand beyond this scope as the organization matures and other relevant topics are raised.*
> *(b) The work of the AORF is intended to complement and not duplicate the work of other international bodies in the field of offshore petroleum safety or anybody associated with the Arctic Council."*

This project is closely connected to the core of AORF's purpose of exchanging information and experience within Arctic-relevant HSE regulation across multiple jurisdictions, within the defined geographical area.

1.5 The current project is based on earlier work

As stated in AORF's articles of incorporation, its purpose of AORF is to complement, not duplicate, work performed by other multinational bodies. This is also something that the Petroleum Safety Authority Norway emphasized when formulating the SVW assignment as part of the "Arctic 2019 project".

The project is based on and must be seen in the context of other initiatives of intergovernmental regulatory work in the petroleum sector.

Because of their content, the following reports may be mentioned, due to their particular relevance for the work in this project:

- "*Assessment of international standards for safe exploration, production and transportation of oil and gas in the Barents Sea - Final Report Phase 4*", prepared by DNV and VINIIGAZ as project managers. The report is included as part of "Barents 2020" (the "DNV report").

- "*Final Report: Standardization as a tool for prevention of oil spills in the Arctic*", 2017, prepared by "*Emergency Prevention Preparedness and Response*" ("EPPR"), which is a formal working group under the Arctic Council (the "EPPR Report").

There is some overlap between the "Arctic 2019 project" and the two reports mentioned above. All three projects deal with the use of standards applied in support of Arctic petroleum operations regulatory enforcement. Thus, it is relevant to take these reports into account when considering the description of what are Arctic specific characteristics. The most relevant aspect of the reports, however, is their concurrence with SVW's assessment that standardization appears to be a useful tool to understand common features and challenges in regulating Arctic petroleum operations across jurisdictions.

The aim of the "Arctic 2019 project" has been to highlight the matters from the perspective of the authorities. The DNV report largely takes an industrial perspective, while the EPPR report deals with the mapping of standardization work itself. The "Arctic 2019 project" is aimed at the HSE dimension, while the other two reports cover a wider range of Arctic issues.

1.6 Subject matter issues

Based on the Project Description (in particular section 3.1), and preliminary mapping directed towards the intended participants and partners in the project, the Petroleum Safety Authority Norway selected a

combination of general and specific topics to form the foundation for comparing Arctic HSE regulations. With this in mind, SVW was asked to carry out a survey and, in light of the answers, carry out a comparative analysis.

Selecting specific topics and methodology, was intended by the Petroleum Safety Authority Norway to bring forth the characteristics of HSE regulation in the contributing jurisdictions. At the same time, the Petroleum Safety Authority Norway sought to identify whether there were commonalities or systematic use of standards in rules applicable to Arctic conditions. Given the different legal traditions and administrative structures among the participating states, any similarities in applying specific standards would not necessarily lead to the same regulatory effect.

One of the purposes of including specific topics was to provide examples of the practical application of the participants' general regulatory approach. Selected items were thought to represent areas considered to have particular joint interest among participants. The questions, answers and documentation were organized so that the results of the work could form a basis for a concrete follow-up in an extension of the Arctic-2019 project, or at least strengthen future Arctic cooperation within the petroleum sector. The project seems to have triggered such interest among invited parties. This became particularly apparent when SVW briefed on the project and its progress during AORF's meeting in Oslo on October 17, 2019.

The report addresses the following topics:

(1) *General topics:*

- Overview of selected authorities' regulatory approach or strategies regarding HSE issues relevant for petroleum operations in the Arctic
- Description of how legal or industry standards are applied directly or indirectly as part of regulations or regulatory enforcement
- Delineation or overlapping public administrative responsibilities at different levels of government, sectoral authorities or others acting on behalf of public authorities on specific issues or address specific risks related to petroleum operations in the Arctic.
- Overall information on the organization of authorities and enforcement power of HSE regulations.

(2) *Specific topics:*

- Drilling and well design in the Arctic
- Technical regulation of fire safety, especially in severe cold conditions
- Evacuation and emergency preparedness, especially linked to challenges with low temperatures, distance and darkness

1.7 Clarification relevant for the work

1.7.1 *In particular on use of HSE as term*

"HSE" is regularly used as an acronym for issues related to health, safety and environment. In this context, safety is understood as protection against unintended incidents or accidents[2]. Environment relates to the surroundings of personnel participating in petroleum operations, thus mainly refers to their working environment. Against this background, the approach taken in the survey and subsequent analysis does not address matters primarily related to the protection of the natural environment.

[2] In English, one distinguishes between *safety* and *security*. This report relates to the content of the term *safety*.

Regardless of the delineation, HSE measures are a significant contributing factor in protecting the natural environment.

Responsibility for subject matters comprised by the term HSE, may be organized and distributed between different administrative bodies, and there may be different transition points between scope of regulations and areas of responsibility, in the various jurisdictions.

Even though the core of the HSE term may be clear, it is at the same time a general term that may be interpreted broadly and differently depending on context. To allow a meaningful analysis of HSE regulations, one must be aware that the jurisdictions selected may relate to HSE differently than in Norway. Various elements may be included in HSE or any similar acronym or term, but with a different meaning or content.

In Norway, the Petroleum Safety Authority Norway has the responsibility for safety and the working environment, as well as security and emergency preparedness. The Norwegian Environment Agency is in charge of natural environment issues such as emissions and discharge permits. Other Directorates and Agencies have specific responsibilities in relation to a number of areas relevant for or with an interface with petroleum operations; such authorities include the Norwegian National Health Authority, the Norwegian Food Safety Authority and the Norwegian Radiation Protection and Nuclear Safety Directorate[3]. Many tasks are delegated from a ministry to a directorate in Norway, but in some cases also from several ministries [to one directorate] such as in the case of the Petroleum Safety Authority Norway,

Such administrative division, allocation of responsibilities or cooperation between authorities illustrates that HSE may easily include overlapping and adjacent regulatory responsibilities. This is the case also in other jurisdictions, not only in Norway.

When requesting for information from selected partners, it was decided not to define the content of the HSE term. Instead, the approach was to highlight the elements of the HSE term considered particularly relevant to the project. By doing so, answers from individual recipients became less dependent on the respondent's own classification of terms or operations related to HSE or similar acronyms.

The Questionnaire therefore emphasized the following with reference to use of terms:

- "*Rules and regulations for the promotion of safe offshore petroleum activities are often classified under umbrella-terms such as "HES"/"HSE" or similar. Such terminology will normally cover topics such as* ***safety, working environment and emergency preparedness*** *– which is at the focal point of the Arctic 2019-project.*
- *Traditional use of terms such as "HES"/HSE" will commonly also include the natural environment. Safe offshore petroleum activities in the Arctic region is a prerequisite for the protection of the vulnerable Arctic natural environment. However, the* ***impact on or consequences for the natural environment fall outside the scope*** *of this Questionnaire and the Arctic 2019-project.*"

1.7.2 *Other actors with confined government authority on safety*

Government tasks may be delegated to other entities than public authorities. Under Norwegian law, authority may be delegated to privately owned and controlled entities. An example of this is the classification companies.

[3] See (Norwegian) Framework Regulations, section 67

The extent this is a chosen approach, varies between jurisdictions. An important part of the report is to identify possible similarities between the different jurisdictions. We will therefore point out how authorities interact with private sector when developing new rules by applying standards. However, the public sector perspective remains central. Ultimately, the authorities decide or endorse standards or determine the content of the regulatory requirements. Including whether standards shall be given direct application or may be used to comply with functionally designed rules or legal standards.

Companies may also be expected to apply standards the authorities have not directly or specifically referred to, but which are used as company management tools, or which the company considers will fulfil regulatory requirements. Such *standards* are not addressed in this report.

1.7.3 *Emphasis on coastal state jurisdictions*

The mapping and analysis made and included in the report, is limited to offshore petroleum operations.

The report is geographically delineated against petroleum operations within the respondent's territory (which essentially entails land territory or "onshore" and the territorial sea). However, in the Questionnaire, SVW has not delineated sharply between offshore activity and activities in other areas. The reason is that petroleum operations associated with offshore petroleum deposits to varying degrees can, in an integrated value chain; result in associated activities on land. Nor has there been any desire to exclude information about approaches or the use of standards for regulatory purposes that did not include a geographical delimitation. For this reason, any information received that is considered relevant for offshore activities in the Arctic has been included.

Nevertheless, the focus is primarily directed at maritime areas seaward of the territorial sea. Here, all coastal states are subject to international law that, in principle, differ from those applicable to sovereign states within the territory[4]. These are rules the Arctic states as coastal states as well as other states must adhere to. This naturally affects regulatory approach and scope.

Focusing here on areas that, pursuant to the Law of the Sea, are subject to freedom of the high seas principals, the Arctic states will also encounter comparable jurisdictional challenges, especially in addressing the relationship between coastal state jurisdiction and flag state jurisdiction. Although flag state jurisdiction constitutes a particular challenge for offshore petroleum operations regulation, this is not specific to the Arctic.

The public international law framework, governing offshore petroleum operations jurisdiction is the same for all respondents. The legal and regulatory framework offshore is often separate from the sovereign state's internal law organization regardless of whether the sovereign state is organized as a federal state or otherwise. The public international law challenges associated with offshore petroleum operations exist independent of the fact that the Arctic states have different legal traditions. Although coastal states will have a varied approach to how regulations are developed, expressed and enforced, the public international law basis will in general remain identical.

[4] See challenges regarding jurisdictional issues between coastal state and flag state jurisdictions in relation to production installations in general in the article "FLNG – 'ship' or 'offshore installation'? Common pitfalls for investors, operators and regulators, by Bjørn-Erik Leerberg, International Law Office, Energy & Natural resources Newsletter April 3 2017.
https://www.lexology.com/library/detail.aspx?g=f1df42bb-942e-4997-b253-fc7c858088ac

See also Prof Knut Kaasen's review of jurisdictional challenges in safety regulation of offshore petroleum activities subject to Norwegian coastal state jurisdiction. Chapter 5 - *Safety Regulation on the Norwegian Continental Shelf* in *Risk Governance of Offshore Oil and Gas Operations*. Authors Preben Hempel Lindøe, Michael Baram and Ortwin Renn (eds), (2014) Cambridge University Press, p.103-130, in particular sub 5.2 *the Problem of Jurisdiction*, pp. 109-112.

2 Methodology and approach

2.1 Preparations

2.1.1 *Initial information collection*

The Petroleum Safety Authority Norway's implementing of the program under "*Arctic 2030 - The Ministry of Foreign Affairs' project cooperation in the northern areas*" was based, among other things, on the initial mapping work.

Mapping was carried out with the assistance of SVW following the call-off / commissioning order on October 22, 2018 under the aforementioned framework agreement between the Petroleum Safety Authority Norway and SVW. The mandate for the mapping assignment was broadly stated as follows:

- Obtaining and assessing legal sources / documentation relevant to completion of work in 2019 described in "*project application # 11480 Regulation and standardization of Arctic petroleum activity*" (…)

The mandate was further specified in Appendix 2 of the call-off stipulating:

- *"Knowledge acquisition, i.e. mapping legal sources, national and international, such as reports, surveys, etc. that may be relevant to the project.*
- *In connection with knowledge acquisition, identify gaps and information that is difficult to access.*
- *Provide a written assessment and recommendation of what sources work in the 2019 project may and should build on."*

2.1.2 *Mapping report*

In response to the requirements of the assignment, SVW submitted an initial survey report to the Petroleum Safety Authority Norway on 5 December 2018, cf. report *Preparation for a project on HSE regulation in Arctic petroleum operations - 'Regulation and Standardization of Arctic petroleum'.*

The survey clearly recommended to involve "*authorities (legal professionals and technically trained personnel) from the relevant jurisdictions*" in order "*to obtain solid comparative basis for the analysis to be conducted as part of the 2019 project.*

The Petroleum Safety Authority Norway agreed with this recommendation. Given the framework of the Arctic program, it was decided that the preparation and distribution of a Questionnaire was the appropriate method and cost efficient solution for the uniform, structured and systematic collection of information on regulatory systems and practices from the authorities of the relevant Arctic jurisdictions.

2.2 Involvement of authorities in other countries

2.2.1 *Background for involvement of other countries*

Onshore, as well as offshore petroleum operations face many different natural challenges in different parts of the world. Any activity, and not least high-risk activities such as offshore petroleum operations, face additional and substantial challenges in the Arctic precisely because of the natural conditions. This must be taken into account when designing the mapping method material and procedural rules, as well as when choosing enforcement regime, the choice of standards, and their inclusion and purpose in regulations and the purpose of the application.

There are common features in offshore operations that naturally affect the regulatory regime of all of the states participating in the survey. On the high seas, private property ownership of the seabed or

petroleum resources does not apply. There are no permanent settlements. At the same time there is a limited, relatively comparable challenge facing all Arctic states in relation to alternative use of the sea and their use for other commercial activities. Traditionally, this has been limited to fisheries and navigation. Extraction of minerals is may be a future industry; in addition, CO2 storage may be possible.

Challenges in a legal context are equally somewhat adapted to uniform treatment than what is the case on land, although the maritime environment and Arctic features such as, climate and indigenous people may vary when comparing the participating states.

The fact that coastal states has a common legal basis with regard to continental shelf jurisdiction, suggests the presence of a greater degree of common platform for the collection of data, analysis and findings.

2.2.2 *Invitation to participate*

On 8 April 2019, the selected countries were invited by Petroleum Safety Authority Norway, based on the recommendations from the preparatory work, to contribute to the project: USA, Canada, Greenland (Denmark), Iceland, Finland and Russia.

In the invitation, the Petroleum Safety Authority Norway stated the background for the project, indicated methodological approach, what kind of contributions PSAN was looking for and assumed scope of work. Current and specific topics assumed to be of interest to respondents were also set. Invitees were further encouraged to make further contributions to the project as appropriate.

The data collection, reporting and communication was sought to be simplified by asking invited authorities to identify specific contact persons. These persons should have primary responsibility for following up the project within each jurisdiction.

All government agencies the Petroleum Safety Authority Norway contacted confirmed a desire to participate, and contact points were established. The United States and Canada also made up front suggestions with regard to subject matters to be included in the project. The Petroleum Safety Authority Norway also in subsequent correspondence clarified with US representatives project focus on HSE and the exclusion of any regulatory instruments addressing pollution and the Arctic natural environment.

2.2.3 *The Questionnaire*

Based on, among other things, the above feedback from the partner countries, SVW together with the Petroleum Safety Authority Norway prepared the Questionnaire. Input from Canada and the United States was taken into account when designing the Questionnaire. SVW forwarded the Questionnaire to invitees on behalf of the Petroleum Safety Authority Norway on 17 June 2019.

The Questionnaire is attached as Appendix 1 to this report.

2.2.4 *Replies from partner countries*

The Petroleum Safety Authority Norway and SVW received feedback on the Questionnaire from several invitees. However, only the responses from the United States and Canada had a scope, structure and content that enabled its inclusion in this report as envisaged.

It was a prerequisite for the project that "*authorities (lawyers and technically trained personnel) from the relevant jurisdictions*" should actively contribute to the study by answering the questions as outlined by the Questionnaire within the topics the Petroleum Safety Authority Norway had selected after consultation with respondent representatives. The fact that the extent of the feedback - despite prior consultation - did not have the expected systematic content has, of course, significantly affected the analysis and report.

SVW consulted the Petroleum Safety Authority Norway to clarify how to proceed with the analysis work and report to be completed. The Petroleum Safety Authority Norway instructed SVW to maintain the original methodology and approach, but that the analysis and report should be focused on the material received from Canada and the United States.

The scope of the project was thus not completed entirely as expected. Despite a more modest data base, the expectation is that the material received and the analysis undertaken can illustrate some basic features, identify some challenges or point to items that later could form the basis for further development of Arctic cooperation on the issues covered by the project.

3 Background for the Arctic as theme

3.1 What is the Arctic?

The term "Arctic" may have different meanings in different contexts. For example, the Arctic may refer to varying geographical, climatic, functional and administrative boundaries depending on context and requirements.

An illustrative map (Figure 1 - *Arctic administrative areas*)[5], where the administrative boundaries at the first administrative level below the nation-state level clearly shows that the "Arctic" contains very different types of governance systems. Within each nations state, there are varying internal administrative hierarchies. Because it is not always sufficient to regulate at the nation state level, the many different administrative approaches must be considered in a survey like this, as it is not always sufficient to relate to regulations at the nation state level.

Figur 1 - Arctic administrative areas

A useful delineation of the term Arctic depends to a large degree on the purpose of its application. In an HSE perspective, it may be useful to consider how the term has been applied to other relevant corresponding areas. This variation is illustrated in the map included on the next page (Figure 2 - *illustration of various definitions of the Arctic*) showing the geographical effects of different definitions.

An example is the definition of *Arctic Emergency Prevention, Preparedness and Response boundary*, which was decided by agreement[6] by the Arctic Council's response subgroup for oil spill. The definition is drawn on the map on the next page (Figure 2 – *illustration of various definitions of the Arctic*). Taking mitigating action is important when an unintended and undesirable incident occurs. It is equally important to establish and enforce preventive measures prior to any such incident, and in this context establishment of relevant regulation plays an important part. A co-operation among concerned

[5] Illustration by Norwegian Polar Institute (Nor: Norsk Polarinstitutt)

[6] Agreement on Cooperation on Marine Oil Pollution Preparedness and Response in the Arctic

authorities within the HSE area for emergency preparedness purposes could help reducing the likelihood that rescue operations have to be carried out.

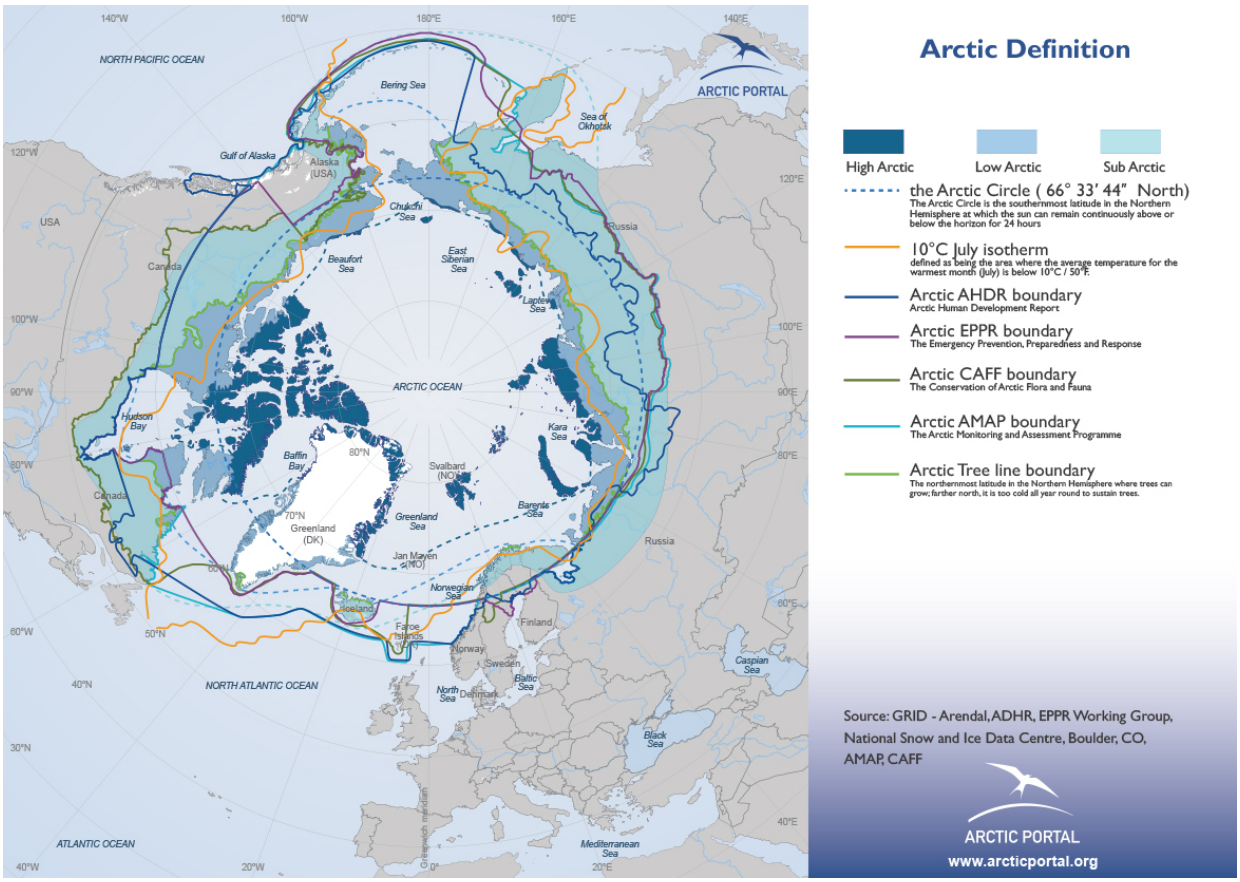


Figure 2 – illustration of various definitions of the Arctic

Of particular relevance for the analysis described in this report are the geographic and climatic characteristics that may pose comparable challenges to petroleum operations and the regulation of such for all the authorities intended comprised by the study. The ambiguity of the term "Arctic" was therefore addressed in the Questionnaire[7]. The respondents, however, would need a common reference and for this reason, the "Arctic" was described as follows:

- *"**The 'Arctic' region** as a geographical term will have different meaning in the various jurisdictions. For the purpose of this project, it was not considered necessary to precisely define the term. The purpose of the project is to identify how similar type conditions are addressed for regulatory purposes."*

One of the aims of the project was to shed light on the respondents' experience with regulatory work related to risks relevant to Arctic conditions. This approach is independent, and irrespective of whether an area actually falls under one or more of the different geographically linked definitions of the Arctic or what is otherwise referred to as Arctic in other contexts. This was emphasized in the Questionnaire as follows:

- *"The purpose is to **focus on common risks unique to offshore petroleum activities in the Arctic**. Such risks may include climate conditions, logistic challenges resulting from distances, ice, darkness, difficulties associated with communication, transport requirements and a particularly vulnerable environment."*

[7] The Arctic Project 2019 – Questionnaire by SVW

The description of "risk" coincides with a more technical focused assessment included in the Barents 2020-report[8]:

> *"The additional arctic challenges are caused by low temperatures, ice, icing, darkness, remoteness and vulnerable environment. (...)) It is reasonable to deduct that the consequences of accidents - in terms of loss of lives, environmental damage and/ or economical loss – may be more severe in the Arctic due to:*
> - *remoteness, huge distances, and lack of infrastructure which make emergency response more challenging*
> - *darkness which makes response more difficult*
> - *extreme temperatures and weather making response more challenging*
> - *sea ice complicating rescue operations and oil spill response*
> - *vulnerable marine and coastal environment*
> - *potentially long down-time of operations after accidents, due to only seasonal access for repair*
> - *high public attention to activities in the Barents Sea, low public tolerance for accidents, with potential for loss of reputation for all parties involved"*

The risk factors of relevance for petroleum operations in the Arctic will vary. Delineation cannot always be established based on the risk factors alone. Such factors will form part of an overall assessment if a geographical area is to be considered Arctic in legal terms. Delineation is also necessary if it is needed to address risk factors individually.

The Barents 2020-report indicate that a key element of an overall assessment will be to consider if special measures are needed in order to prevent undesirable incidents. Even more so when an incident occurs in an environment where remedial actions will quickly become very demanding - typically in fully or partially areas covered by ice. This is partly reflected in this quote from the report:

> "*In order to maintain the same safety level (i.e. risk level) as in the North Sea, it is more effective to address and reduce the probability of incidents, to prevent accidents from happening.*" [9]

The changing climate represents an additional challenge. This factor will, at least in relation to a delimitation based on climatic conditions, cause that the geographical scope of the Arctic will vary over time. An obvious example is the definition where the Arctic is determined by the location of the 10 ° C isotherm in July. The boundary is drawn on the map on the previous page (Figure 2 - *illustration of various definitions of the Arctic*).

3.2 Offshore petroleum operations in the Arctic

3.2.1 *Introduction*

The nation state is in a different legal position with regard to offshore petroleum operations versus land-based operations. This also applies for other economic activities when taking place offshore.

The coastal state owns the resources on the seabed and in the subsoil of the continental shelf. Regulatory measures aimed at the industry therefore have a significantly different context offshore compared to if the industry sector, including its resources, was subject to private property rights or specific indigenous rights.

[8] Barents 2020-report ("Report no. 2009 – 1626") section 3.1. – developed by DNV as project manager.

[9] Ibid.

Added to the basic economic interest that the resource owner, the industry players and other stakeholders share, there is also another offshore petroleum operations characteristic challenging the design and enforcement of any regulatory regime: The physical risk associated with offshore operations on or in connection with fixed, mobile or floating facilities. If something goes wrong, it can go very wrong, for the people directly or indirectly, for the facilities and other infrastructure, and not least for the natural environment directly or indirectly exposed to the incident.

In the Arctic, these particular risks are very apparent because of the characteristics of the natural conditions.

This means that legislators and enforcement agencies have to adapt regulatory techniques, regulatory content, incentives and sanction methodology to achieve the desired effect, including to prevent or avoid incidents and accidents and limit and mitigate negative effects of incidents.

The level of offshore petroleum operations in the Arctic varies between different jurisdictions. There are impending or ongoing petroleum operations to some extent in Canada, the United States (Alaska) and Russia[10]. Below we provide a brief summary of operations in the countries invited to participate in the study. The overview also indicates which of the contributing partners are most likely to have in place regulations or to have gained experience from Arctic petroleum operations, and consequently may be able to contribute most comprehensively to the study.

3.2.2 *Canada*

Figure 3 - Drilling for oil north of the Arctic Circle, near Tuktoyaktuk, Northwest Territory, Canada

Until the end of 2018, Canadian authorities have granted a number of exploration licenses in the areas where federal jurisdiction is exercised, this includes the Beaufort Sea, the Sverdrup Basin and the Eastern Arctic which inter alia encompasses large portions of Nunavut and parts of the Labrador Sea. (See Figure 9 - *map with overview of the various petroleum jurisdictions Canada* - below). Large parts of the areas are covered by up to five meter thick ice throughout the year. The Canada Energy Board is the responsible regulatory authority in the areas just mentioned (see section 5.4.1 below). Over time, several exploration operations have been carried out in the area. Some have led to discoveries, but none has been considered commercial so far. The areas with discoveries generally have the "*Significant Discovery License (s)"* status. The licence[11] entitles the licensee (an exclusive right) subject to certain conditions to retain the area until such time that the discovery is assessed by the company to be sufficient to be declared commercial. Thereby triggering the right of the licensee to apply for a production license. So far, there are no active production licenses in the Beaufort Sea.

[10] There is also exploration, exploration drilling and extraction in Arctic areas subject to Norwegian jurisdiction, but since Norway is not included in the study or dealt with in the report, this activity is not discussed further.

[11] More about this type of license which is rare internationally: https://www.rcaanc-cirnac.gc.ca/eng/1468946906852/1538587949255#chp7-3

The absence of permanent ice and relatively mild temperatures has made it easier to carry out petroleum operations outside Newfoundland and Labrador. These areas fall only partially within some of the Arctic definitions discussed above. However, ocean currents and wind bring drift ice and icebergs from the Arctic Ocean and Greenland to this area. Evidently, this constitutes a constant challenge for exploration, exploration drilling and production of petroleum. Various measures have been taken to prevent damage to facilities and other equipment due to colliding ice. Climatic conditions around Newfoundland and Labrador also illustrate the importance of refraining from drawing any sharp delimitation of what constitutes the Arctic for the purpose of this study. It is knowledge on how to in legal terms relate to and resolve the presence of unique characteristics distinguishing the Arctic region that is relevant, not whether the specific area where such characteristics occur, coincides with definitions of the Arctic established for completely different purposes than for petroleum operations offshore.

Activity in the Labrador Sea along the northeast coast of Canada is concentrated east of Newfoundland. Four fields[12] are producing;[13] in addition, there are nine so-called *Significant Discovery Licenses* (see above) and several exploration licenses.

3.2.3 *United States of America*

In the United States, offshore petroleum operations are conducted under Arctic conditions in the state of Alaska, along its northern coast and the western coast areas facing the Bering Sea. Most of the activity is near or on shore, and mainly near the Prudhoe Bay area on the northern coast. The climatic conditions here are comparable to those found along the north coast of Canada.

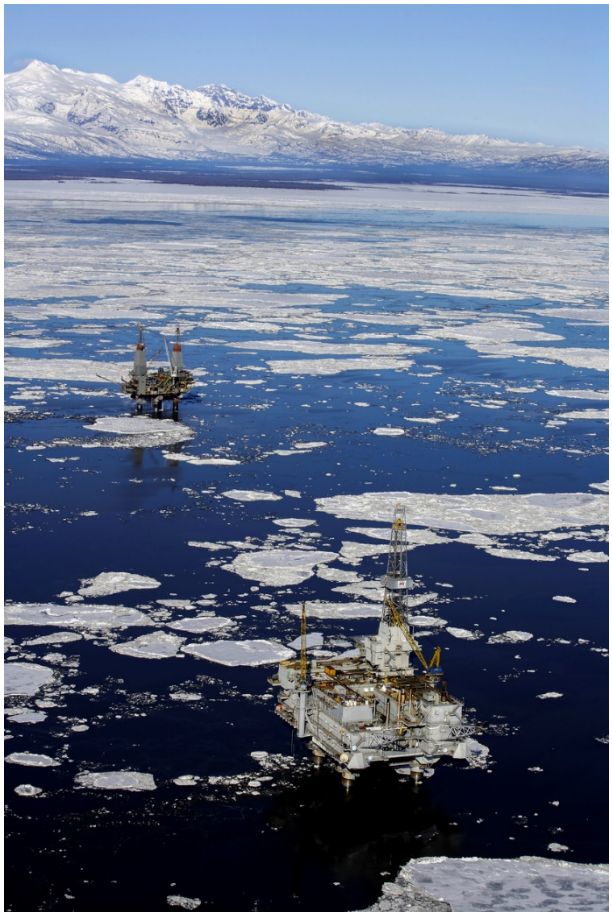


Figure 2 - Offshore oil rig Cook Inlet, Alaska,

The wider Prudhoe Bay area has been producing petroleum since 1977. The oil is transported via a pipeline of approx. 1,287 km across land from Prudhoe Bay to Valdez. Pipeline is adapted to the tundra found in large parts of the areas it intersects. From Valdez, the oil is transported to the markets by oil tankers.

At its peak, the larger Prudhoe Bay area produced 1.5 million barrels of oil per day. In 2018, production was approx. 270,000 barrels of oil (including other liquid hydrocarbons) per day. Although the Prudhoe Bay reservoir itself has produced oil for 42 years, it is still expected to produce for many years.

When the discoveries were originally made, it was estimated to contain 9.6 billion barrels of oil, production as of 2016 was 12.3 billion barrels of oil and NGL. As of 2016, the estimate was that "*Estimated Ultimate Recovery*" would be approx. 14 billion barrels, approx. 46% more than originally expected.[14]

[12] The term field is used for ease of reference as a collective term for facilities and petroleum deposits covered by the total development and operation complex and for the expense and responsibility of a defined group.

[13] https://www.cnlopb.ca/offshore/

[14] http://www.akleg.gov/basis/get_documents.asp?session=29&docid=66891

3.2.4 *Russia*

Figure 5- image of the Prirazlomnoye platform in the background with a shuttle tanker in the foreground

Arctic petroleum operations in the offshore areas of Russia are linked to the Cara Sea, the Barents Sea and the Pets Sea. At present, only one discovery has been made that has led to the production: the Prirazlomnoye field (see Figure 5 - *image of the Prirazlomnoye platform in the background with shuttle tanks in the foreground*). The field mainly produces oil and is estimated to contain 70 million tonnes of recoverable oil[15]. Transportation is by specially built shuttle tankers (intera alia with double hulls).

A floating production platform is located south of Novaya Zemlya approx. 60 km from the Russian coast (about 980 km from Murmansk). The field is located in an area with typical Arctic conditions for much of the year, often referred to as "*Low Arctic*"; cf. the map included as Figure 2 - *illustration of various definitions of the Arctic,* above. At the time of the design and construction of the facility offshore, it was assumed that the ocean would be ice-free approx. 110 days a year.

3.2.5 *Other countries participating in the study*

The area off the coast of Greenland (Denmark) is believed to be among the more promising petroleum provinces in or near the Arctic. To date, some exploration has been carried out, including exploration drilling. So far, no commercial discoveries have been made.

Iceland has awarded three offshore exploration and production permits, all of which have been relinquished. Some seismic has been acquired, but no exploration wells have been drilled. There is no petroleum operations offshore Iceland now.

SVW understands that offshore Finland is considered an area of modest potential for discovery of commercially recoverable petroleum.

[15] https://shelf.gazprom-neft.com/about/company/ and https://www.euro-petrole.com/oil-production-at-gazprom-nefts-prirazlomnoye-field-to-increase-almost-two-fold-n-i-12815

3.2.6 *Other Arctic Ocean areas – possible developments*

Potential for commercially exploitable petroleum[16] is believed to be present in the Arctic also beyond the areas currently subject to undisputed coastal state jurisdiction. See the maps below for estimates of undiscovered oil resources (Figure 6 *U.S. Geological Survey 2008 – estimated undiscovered oil resources in the Arctic*) and gas resources (Figure 6 *U.S. Geological Survey 2008 – estimated undiscovered gas resources in the Arctic* - next page) [17].

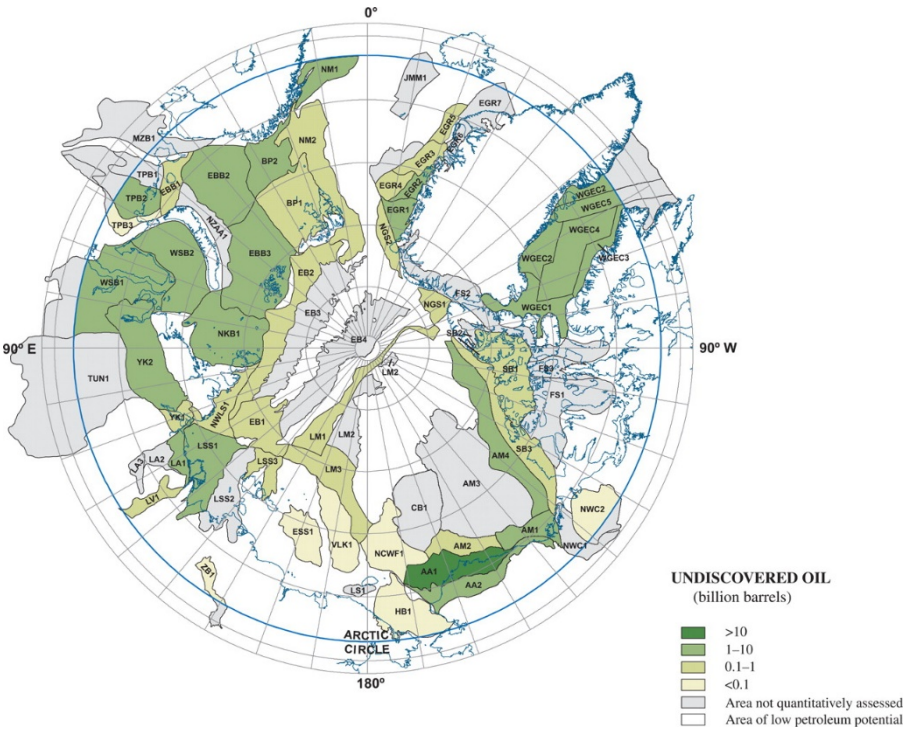


Figure 6 – U.S. Geological Survey 2008 – estimated undiscovered oil resources in the Arctic

The legal basis for the coastal states' rights to petroleum resources on or in the continental shelf, and coastal states' jurisdiction over exploration and production, derive from public international law. Of the five coastal states that border the Arctic Ocean, four are parties to the UN Convention on the Law of the Sea[18]: Canada, Denmark, Norway and Russia. The United States has signed, but not ratified, the convention. All five countries have declared and are enforcing a 200 nautical mile exclusive economic zone, which also includes the continental shelf within the 200-mile limit. The coastal states exercise *sovereign rights* over natural resources and exclusive jurisdiction over facilities and activities for the exploration, production and exploitation of natural resources in these offshore areas.

The Convention on the Law on the Sea stipulates a time limit of 10 years for a Member State to submit a claim on the continental shelf beyond the exclusive economic zone of 200 nautical miles. All parties to UNCLOS with a coastline towards the Arctic Ocean have submitted such continental shelf claims before the deadline. The US cannot claim under the rules of the UNCLOS until after ratification. It is assumed that it will still take considerable time for all the continental shelf claims to be settled, as claims must be uncontested, as well as documented in order to fulfil the material and procedural requirements following from the convention. In the longer term, however, clarification of what coastal states that may exercise *sovereign rights* over continental shelf resources beyond 200 nautical miles will open up operations in new areas, closer to the North Pole. These areas are generally believed to be more challenging to operate in and even more vulnerable than the areas further south where there is already some ongoing petroleum operations. For more on international law aspects of petroleum operations offshore, see section 5.1 below.

[16] See US Geological Survey report from 2008 - http://library.arcticportal.org/1554/1/usgs.pdf

[17] For a shorter summary see: https://pubs.usgs.gov/fs/2008/3049/fs2008-3049.pdf

[18] United Nations Convention on the Law of the Sea, abbreviated UNCLOS.

Due to the challenges and hence the cost of operations in the Arctic, as well as distance from markets, stabilized crude oil and other petroleum components that are liquid under normal atmospheric conditions, such as NGL or condensates, will most likely first be able to commercially enable commercial development and operations. In relation to undesirable incidents, a focus on production of liquid hydrocarbons instead of gas, increases the risk of adverse effects in case of incidents or accidents, such as oil spills, with presumed negative consequences for a vulnerable environment.

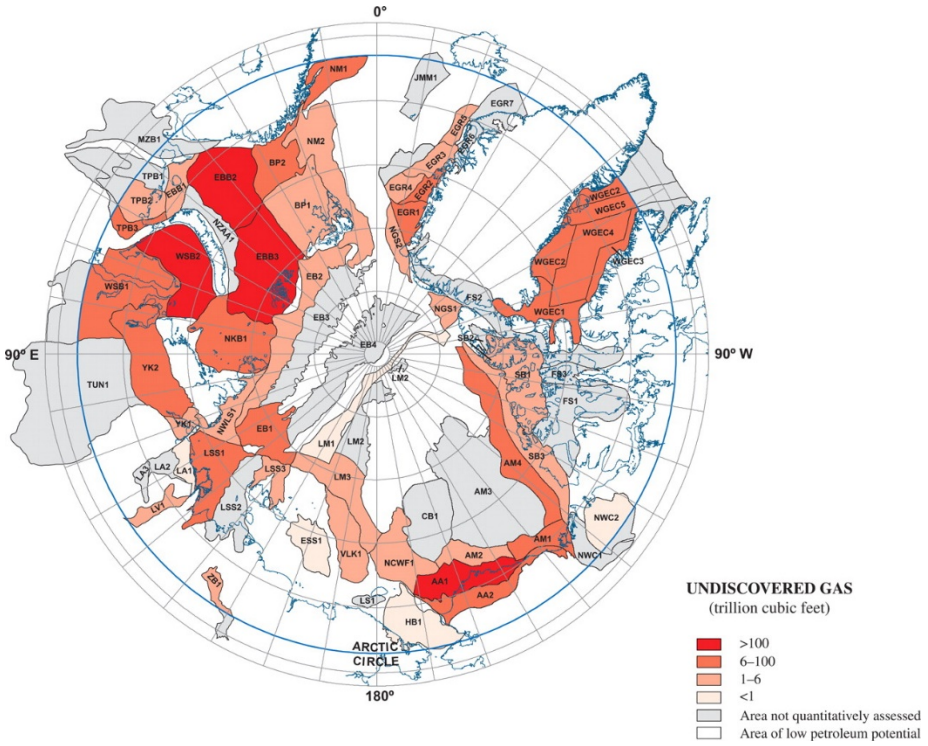


Figure 7 – U.S. Geological Survey 2008 – estimated undiscovered gas resources in the Arctic

Somewhat paradoxically, climate change may result in that offshore area which today have Arctic characteristics, lose these characteristics, have them significantly altered or adopt completely new characteristics in the future.

Regardless, climate change could mean that larger areas of the Arctic will become available for petroleum operations because of reduced year-round or seasonal sea ice, drifting ice or icebergs. At the same time, one must be prepared for annual or short periods of deviations from the "normal" climatic conditions that cannot easily be predicted.

3.3 The need for mapping HSE regulations in the Arctic - standards

The need to develop HSE standards in the Arctic has (as mentioned earlier) to some extent been systematically addressed in past reports such as the Barents 2020 project. It states, inter alia:

> *"The industry's need for HSE industry standards to take into account the additional challenges due to arctic conditions, i.e. low temperatures, ice, icing, long distances, darkness, etc. have become apparent in connection with proposed oil and gas development projects in the Barents Sea, and the increased maritime tanker traffic from the Barents sea along the Norwegian coast due to petroleum developments in the High North.*
>
> *The international oil and gas industry applies recognised technical standards which are used worldwide. The accumulated experience of the industry over many years and from all parts of the world is included in these standards through systematic updating and issuance of new revisions. These standards therefore represent best international practice in order to achieve an acceptable level of safety for the oil and gas industry, including offshore activities.*

> *However, the updating of standards is a time consuming process, since it requires consensus from many parties, and the improvements may come late for actual industry needs. In new situations, such as for offshore projects in the Arctic, existing regulations and technical standards have normally not been prepared or updated to address arctic conditions. In order to achieve an acceptable level of safety against new or expanded HSE challenges due to arctic challenges, existing technical standards must be supplemented (...)"*[19]

In the preliminary mapping prepared by SVW and submitted to the Petroleum Safety Authority Norway on December 5, 2018, the following characteristics of the HSE regulation in the Arctic were suggested (page 5):

> ***"(…) Rules and Strategy***
> - *There is no common regulatory strategy for HSE related to petroleum activities in the Arctic.*
> - *There is no harmonized, common or predictable HSE framework for petroleum activities in the Arctic. Existing regulations and standards are fragmentary, even to some extent within the individual jurisdiction.*
> - *Existing regulations and institutions are formed within different legal traditions, with very different constitutional foundations and different administrative organizations, making comparative analysis challenging.*
>
> ***(…) The legal sources situation***
> - *Much of the information in legal sources we have uncovered has a general interest in the HSE segment of the sector and has general relevance – i.e. without specific relevance to the Arctic or targeted to the HSE dimension.*
> - *There is a great deal of information about legal sources, rules of law, institutions, etc., but it can often be challenging to quality-assure the information regarding the degree of precision or whether it is updated.*
> - *Existing regulations and standards are regularly developed, applied and enforced at various legal or organizational levels (international - regional - national - internal or private law based between companies in contract chains)*
>
> ***(…) Especially about the use of standards***
>
> - *There are few HSE specific standards aimed at Arctic operations. The standards are regularly of a technical- or performance oriented nature, with content that most often results in derived HSE use or consequence.*
> - *The use of standards as a regulatory tool or instrument in national law (the co-operation between national law and standards) is difficult to identify with the time available to us. Such mapping requires thorough knowledge of national laws. The interaction between national legislation and standards constitutes the largest gap in understanding and most have proven to be challenging to access, based on our assessment following the preparatory work.*
> - *Standards developed for internal use by industry are not easily accessible "*

The contributions received from the participants through the questionnaire-based survey confirm several of the assessments made above.

At the same time, there seems to be a tendency for authorities in North America to move towards increased use of functionally based approach to regulation. This approach entails that regulatory authorities set functional requirements and provide guidance on the required effect or result of measures. It is then up to the industry to implement, maintain and develop systems, as well as find technical

[19] Barents 2020-report ("Report no. 2009 – 1626") item 1 – developed by DNV as project manager.

solutions that meet the regulatory requirements. As is known from Norway, standards are often identified which will help to meet functionally stipulated requirements. Equally, there are significant differences between jurisdictions in regulatory approach, including between Canada and the United States. We will return to this.

The Arctic-specific requirements or standards must of course be expected to relate to conditions that occur primarily in the Arctic (or areas with similar climatic conditions). This fact alone may cause provisions to become more descriptive. Functional requirements thoughtfully designed may alleviate the need for Arctic-specific regulation.

The development of functionally based regulatory systems in the two jurisdictions mentioned, which, due to their comprehensive responses to the Questionnaire, has contributed significantly to the analysis of this report. It also points to the fact that Arctic-specific regulation is not always a necessary or preferred approach. Instead, regulations that contain functional requirements could provide flexibility. Examples are requirements to perform systematic analyses, before a concept is chosen and a final development solution is decided. An example of this approach is the so-called "safety case". The operator(s) must prepare and document with a preliminary assessment taking into account inter alia particular climatic conditions. Although such regulations are not in themselves Arctic-specific, precisely the functionality of the regulations will ensure that its practical application addresses Arctic-specific risks.

3.4 Examples of standards developed for the Arctic

The International Organization for Standardization, better known by its acronym "ISO," has developed or is developing various Arctic relevant standards, such as:

- Petroleum and natural gas industries — Arctic operations — Escape, evacuation and rescue from offshore installations[20]

This standard is under development and not finally developed by ISO, but has, according to information received under consideration by the Secretariat for a final review before it will be subjected to approval.

Furthermore, the following Arctic-relevant ISO standards for petroleum operations have been published (all apply to *Petroleum and natural gas industries - Arctic operations*):

- Working environment[21]
- Environmental monitoring[22]
- Ice management[23]
- Material requirements for arctic operations [24]
- Metocean, ice, and seabed data[25]

In addition, a new standard has recently been introduced called *Petroleum and natural gas industries - Arctic offshore structures*.[26]

The content of the ISO standards falls outside the scope of this report. As the listed ISO standards are shielded by a payment wall and are not publicly available in general, and consequently cannot be subject to independent public review, they have not been collected, analysed or discussed in this report.

[20] ISO/FDIS 35102
[21] ISO 35101:2017
[22] ISO 35103:2017
[23] ISO 35104:2018
[24] ISO/TS 35105:2018
[25] ISO 35106:2017
[26] ISO 19906:2019

In the shipping industry, there is a long-standing tradition of developing international standards. For Polar Regions (which include both the Arctic and Antarctic), the International Maritime Organization […] has developed its own set of rules: *International Code for Ships Operating in Polar Waters* abbreviated *Polar Code*. The content of the Code is intended to cover

> "*the full range of shipping-related matters relevant to navigation in waters surrounding the two poles – ship design, construction and equipment; operational and training concerns; search and rescue; and, equally important, the protection of the unique environment and eco-systems of the polar regions."*

Some elements of the *Polar Code* are assumed relevant for corresponding Arctic HSE offshore rules, for example - fire safety and protection, life-saving equipment and methods, communication, staffing and training.

A possible criticism that may be raised against these regulations is that they have the character of being minimum standards. This is partly due to the inherent character of the international shipping industry based on flag state jurisdiction with varying interests in effective oversight.

For petroleum operations, a number of jurisdictions need or aspire to achieve much higher standards than such minimum standards.

4 Use of standards as normative tools – the perspective of authorities

4.1 The term *standard*

The core interest for the Arctic 2019 project is oriented towards how the various petroleum regulatory authorities responsible for activities in the Arctic use (technical) standards as a normative instrument. It is the authorities' perspective that is essential.

The term *standard* may cover different types of specifications, definitions or sets of rules. According to the ISO / IEC Guide 2:2004 on *Standardization and related activities - General vocabulary*[27] point 3, standards are so-called *normative documents*. More precisely, a *standard* is defined as:

> "*document, established by consensus and approved by a recognized body, that provides, for common and repeated use, rules, guidelines or characteristics for activities or their results, aimed at the achievement of the optimum degree of order in a given context*"

The motivation behind drafting or applying standards are many. In the aforementioned ISO / IEC Guide 2: 2004, note to section 2 - *Aims of standardization* - it is stated [28]:

> *"The general aims of standardization follow from the definition in 1.1. Standardization may have one or more specific aims, to make a product, process or service fit for its purpose. Such aims can be, but are not restricted to, variety control, usability, compatibility, interchangeability, health, safety, protection of the environment, product protection, mutual understanding, economic performance, trade. They can be overlapping."*

However, the motivation for developing a standard is of little or no importance to the content of the distributed Questionnaire or the analysis that forms the basis for conclusions drawn in this report. What determines the relevance of a standard from a user perspective is its content, its effects and how it relates to requirements or specifications, and whether compliance is consistent with the purpose of the standard(s). This means that standards in practice achieve recognition as relevant, useful or good based on the perceived experience with its use. In this, there is a clear parallel to the relationship between regulatory design and government enforcement.

At the same time, from a government perspective, there are weaknesses in how standards are developed. In general, it is demanding to gain insight into the assessments that justifies or motivates the development of standards. Systematically, standards are not sufficiently accessible to the public. Consultation processes or similar procedures vary widely in character and scope[29]. For example, unions are often not included in the development of many national and international standards. The authorities are more commonly involved, but not always.

4.2 Focus on the government perspective – the advantage of applying standards?

From a government perspective, standards notably supplement or a complement the preparation of legislation. Standards may constitute one of several elements of the normative "toolbox" at the disposal of the authorities. However, this requires competence on the authority's side to assess their suitability, quality, and appropriateness, when selected standards are introduced as a means to comply with government-developed and -imposed regulatory requirements.

[27] https://www.iso.org/standard/39976.html

[28] https://www.wto.org/english/thewto_e/acc_e/sau_e/WTACCSAU59A5_LEG_1.pdf

[29] See Risk Governance of Offshore Oil and Gas Operations (2014), page 180

A number of offshore operations, as well as fixed, mobile or floating facilities and appurtenant equipment, characterizes upstream petroleum operations. Depending on the purpose, they do have a certain level of commonality. Many of the activities will also be extensive in time and space, and technically complicated. Activities may be cyclical, periodically repetitive, lasting or uniform. Effective and relevant regulation of operations requires in-depth specialized expertise in a number of different fields. The authorities do not necessarily always have the prerequisites resources to make appropriate and detailed regulation. Upstream operations is an area of activity that intuitively is appropriate to standardize. For this reason, standards are very practically applicable in the petroleum industry.

In a work published by the International Association of Oil & Gas Producers (IOGP), *Regulator's use of standards*[30] it is stated, among other things, that:

> *"Standards are crucial for the technical definition of oil and gas installations, regardless of whether they are from national, regional, international or industry standard developing organisations (SDO). Good standards for all relevant areas make exploration, development and operation easier in an increasingly more complex and globalised industry. The global oil and gas industry makes use of several thousand standards, plus an even greater number of company and project specifications. An investigation done by CEN in 1994 assisted by OGP (E&P Forum at the time) revealed about two thousand standards in use by a number of operators in Europe only."*

Standards and their application must be put in a context in order to achieve their regulatory intent and effect. In order to understand how *standards* form part of the different jurisdictions' normative systems, they cannot be analysed in isolation.

From a government perspective - and the interaction between public law and the use of standards for regulatory purposes, we highlight the following taken for the same IOGP document[31]:

> *"Regulations for the oil and gas industry are normally set by national regulators, with a few International exceptions such as ILO and IMO. This inadvertently leads to differences in regulations across the globe as different people of different background and culture, with potential for small or large differences in the technology to be applied, write them. Most of the regulators use standards in defining their schemes, regulations, guidelines or other regulatory documents. The hierarchy of these documents is typically as shown in figure 1 below. (...)"*

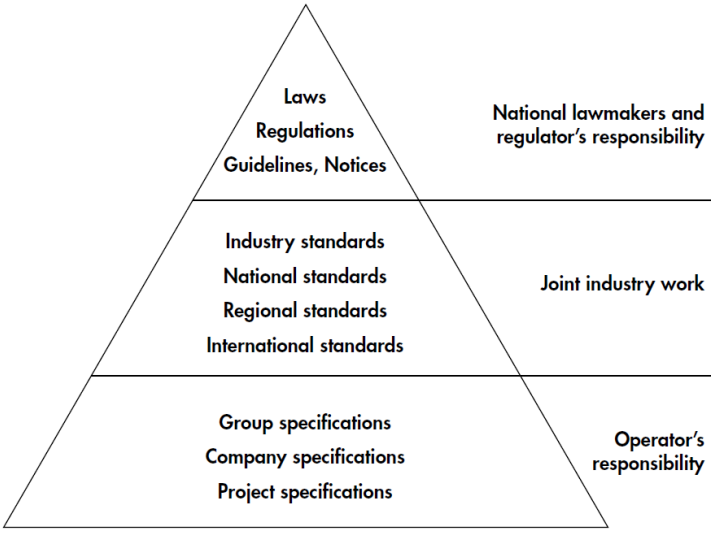


Figure 8 – regulations hierarchy (referenced in quote as figure 1)

The purpose of the following parts of the report is to describe the use - and the interaction - between petroleum regulation as such and the use of a standard for regulatory purposes among regulatory

[30] Report No. 426, from 2010, p. 3; http://www.cbcsd.org.cn/sjk/HSE/policies/international/20130711/download/Regulators-use-of-standards.pdf

[31] The quote uses the abbreviation IMO which stands for "International Maritime Organisation" and ILO for "International Labour Organisation"

authorities among Arctic countries. By applying the terminology in the illustration referred to in the quote above (included as Figure 8 - *regulations hierarchy (referenced in quote as figure 1)*) the main task is to describe the two top levels of the pyramid in relation to Arctic HSE regulation: the public sector legislation, and within it the application of standards that have been developed.

Project specific or internal companies' regulations fall outside the scope of our study. But they form part of the environment the public-law legislation and applied standards should be considered in light of, especially in cases where internal rules are developed to address, for example requirements for internal control as part of a regulatory system based on functional requirements.

In addition to the normative tools illustrated here, international law also contributes a further normative dimension that is particularly relevant in offshore areas seaward of the coastal state's territorial waters. This will be briefly commented on in chapter 5.1.

4.3 How can authorities cooperate in relation to standardisation?

Several legal techniques and approaches are available to increase the degree of uniform practices between different jurisdictions, also with regard to the application of standards or standardization.

One way is to ensure intergovernmental regulation in the form of bilateral treaties or multilateral conventions. This is especially relevant where the activities associated with or challenges arising from the consequences of the activities have cross-border results or effects. In environmental law, there are many examples of such treaty-based regulation like for instance the OSPAR Convention[32] in the Northern Atlantic and the Barcelona Convention applicable to the Mediterranean. The challenge faced here is that negotiations leading to treaties of some substance, and in any case multilateral conventions, require time, are difficult to update or adjust after adoption and ratification. Further, they may quickly be overtaken by events, new circumstances or become heavily politicized.

For countries bordering the Arctic, it is especially relevant to enter into agreements on cooperation within the framework of the Arctic Council [...]. Two agreements are particularly relevant in the context that the analysis supports the content of this report:

- "*Agreement on Cooperation on Marine Oil Pollution Preparedness and Response in the Arctic*" (signed 2013)[33]
- "*Agreement on Cooperation on Aeronautical and Maritime Search and Rescue in the Arctic*" (signed 2011)[34]

These agreements are relatively concise, and establish a formal basis for cooperation between relevant institutions in the member states in areas defined. Another common denominator is the recognition that member states' resources will not always be sufficient individually and cooperation is mutually beneficial. The scope of the two agreements are characterised by being cross-boundary, many other common areas for the Arctic are not necessarily perceived by all authorities to possess the same character.

For the sake of completeness, another possibility to be mentioned is the willingness and extent sovereign states will voluntary submit to supranational solutions. In this context the rules established by the European Union ("EU") is a practical example. These rules have an impact within given areas also on members of the European Economic Area[35] ("EEA"). EU rules could be relevant for Iceland as an EEA

[32] Convention on the protection of the marine environment in the North-East Atlantic of 1992 – see https://www.ospar.org/

[33] https://oaarchive.arctic-council.org/handle/11374/529

[34] https://oaarchive.arctic-council.org/handle/11374/531

[35] EEA consists of EU, as well as Norway, Iceland and Liechtenstein

member and Finland as an EU member (Greenland is not, even though Denmark is an EU member), however, this is not of current interest as the basis for cooperation with the other participants mentioned in the report.

Countries could consider seeking closer harmonization of legislation among themselves. Without any further, thorough analysis, such a task seems to be challenging in a number of areas given the scope and maturity of regulatory preparation required. For countries that have not yet developed extensive regulations, harmonization with other country's regulations may be easier, but in that case, it would still not provide harmonization among all the relevant jurisdictions. One of the respondents substantially contributing to the report has a complex administrative organization oat sub-national level, which means that cooperation with the federal level does not automatically apply to all sub-divisions.

The development of most standards circumvents several of the challenges indicated above, as private players or industry organizations often develop the standards. There are various reasons why industry and industry organizations are developing standards. They consider it useful to address actual commercial needs and to avoid constantly having to "reinvent the wheel". For the authorities, it is often an advantage to refer to industry contribution when developing norms. The use of national and international standards is a recognized regulatory approach. The degree to which the system is then considered self-regulating or part of the public norm set will probably vary. As standards of this nature are often perceived as *technical*, they will typically be subject to limited criticism or scrutiny. Therefore, as a common norms technique, standards appear to be better suited than the alternatives. Some standards are also typically developed for the industry in a country, such as the Norwegian "NORSOK" standards. Often, national standards of this kind can be adapted for use in other countries. This has been the case with a number of API[36] and ISO standards discussed in various parts of this report.

An important justification for establishing functional norms has been to prevent that authorities become 'internalised' with industry. In the context of a normative development approach, it is desirable that industry is responsible for the chosen solutions to the greatest extent possible. Extensive use of prescriptive norms for technical and operational purposes may result in a lack of ownership in the industry as to how problems or challenges should be resolved. One typically settles for "ticking" off the box stipulated by the prescriptive rules, without, performing and adequate overall assessment. The use of industry-developed standards contributes to a greater degree to industrial ownership.

Furthermore, technology and methods are constantly evolving. Standards often have regular cycles of four to five years for re-evaluation and possible updating. The use of standards can thus reduce the need for the authorities to review and amend own rules at the same pace.

[36] American Petroleum Institute

5 General premises for regulation of petroleum operations in the Arctic

5.1 International law as a starting point

It falls outside the scope of the Arctic 2019 project to account for international law aspects of HSE regulation. Nevertheless, it is appropriate to point out some very basic principles of public international law, which are relevant to HSE regulation in the Arctic. This is not intended to be exhaustive.

The purpose is to illustrate how international law will always constitute a relevant legal context also for HSE regulation in the Arctic. Another purpose is to point out that the fundamental rules are identical for the nation states at the international law level. This is not the case with internal legislation in each of the Arctic countries.

Public international law provides the states with a legal foundation for issuing HSE regulation applicable to their Arctic continental shelf areas. Within their own territories, the states may almost without limitation exercise jurisdiction regarding HSE. Whereas exercising coastal state's jurisdiction offshore, it is in practise the UN Convention of the Law on the Sea that defines the extent of jurisdiction. It is significant that the coastal state on the continental shelf exercises *sovereign rights* over operations, including exploration and exploitation of natural resources - including petroleum resources[37]. UN Convention of the Law of the Sea in this respect codifies customary law. Artificial islands or installations may only be established with the consent of the coastal state and pursuant to the convention[38]. The coastal state will have *exclusive jurisdiction* over such facilities. This implies complete HSE jurisdiction, including enforcement. The convention contains no substantive restrictions on the level of strictness of safety that may be stipulated. However, the coastal states are obliged to respect environmental requirements, which, depending on the circumstances, may allow a lower threshold than may be stipulated pursuant to HSE regulations. We do not intend to pursue any environmental assessment here.

Outside the continental shelf, lies the deep ocean floor referred to in UN Convention of the Law on the Seas as the *Area*. The International Seabed Authority in Kingston (Jamaica) regulates resource utilization in this *Area*.

In addition to the general principles of international law, a number of bilateral and multilateral agreements, and other forms of arrangements may also be relevant to Arctic HSE regulation, such as SAR ("Search and Rescue") regulations or the previously mentioned EPPR.

Of practical importance for the development of regulations in the field of HSE, is the institutionalization associated with Arctic issues. In addition to the UN (including the IMO) and the EU, a number of international forums and associations have been established with direct relevance to Arctic HSE regulation. Added to the AORF and EPPR, several multi-lateral working groups are part of the Arctic Council: *Protection of the Arctic Marine Environment* Working Group (PAME) and *Arctic Contaminants Action Program* (ACAP). These are working groups essentially focus their interest on the natural environment and not safety associated with the operational working environment, which is the focus of this study. Other associations, such as the I*nternational Committee of Regulatory Research and Development* (ICRARD) and the *North Sea Offshore Authorities Forum* (NOSAF), are practically important institutions for intergovernmental cooperation in the field of HSE, but not specifically dedicated to the Arctic

Even outside the established institutions and outside the more general rules of public international law applicable to the Arctic, any development of rules must be assessed specifically against international obligations. The Arctic is not a straightforward area to study. In the survey documented in *The Arctic in*

[37] See UNCLOS art. 77. (1)

[38] See UNCLOS Art. 62 (2)

International Law[39], lists 364 different types of agreements concluded between Arctic states. Although petroleum HSE regulation is not directly addressed by the listed agreements (as opposed to regulations for protection of the natural environment), previous agreements may be indirectly relevant also to current and future of HSE regulation.

In the following, the international law dimension will not be pursued any further, as the focus will be on a comparative analysis of the HSE regulations content and use of standards of states having contributed material.

5.2 Legal traditions are different

In the introduction to the Questionnaire, it is stated that the Arctic 2019 project aims to increase knowledge of the participating jurisdictions' use of standards for petroleum operations HSE regulatory purposes.

The use of an identical standard in two different jurisdictions may not necessarily have a uniform regulatory effect. Therefore, in order to achieve greater clarity in the application and effect of standards, and to facilitate constructive dialogue and use of standards, the standards used should be viewed in light of their context.

An inherent challenge in carrying out mapping and analyses of this nature is that the participating jurisdictions differ not only in terms of governance structure and in terms of organization[40], but also in the more basic legal tradition, that forms the framework for the development and application of legislation. The purpose of the discussion here is to make the reader aware of the challenges of most comparative regulatory analysis.

During the presentation of the project and work progress to AORF in Oslo October 17, [2019], there were clear indications that differences in legal traditions had probably not been sufficiently emphasized in previous exchanges of experience. A closer dialogue between the participating countries would be valuable to increase the overall understanding of the content and functioning of the various regimes. Understanding legal traditions will also provide a basis for increased understanding of how similar overall goals were sought achieved, but with different means for each of the jurisdictions concerned. Communication and regulatory cooperation may also facilitate increased awareness of the legal tradition variations among AORF members.

Terms such as public regulation and public administrative law, are clear in a Norwegian context, for most safety legislation for petroleum operations on the continental shelf. Even in jurisdictions adjacent to the Norwegian continental shelf, rights and obligations between the applying state and private legal entities are not established in accordance with the same procedures and principles as in Norway. SVW often chooses to describe such different approaches to how law is developed and applied as *legal traditions* or *legal culture*. A recurring distinction, between the jurisdictions this study was supposed to include, is between *civil law* traditions and (what is normally described as) *common law*.

The mandate for this report does not require a comprehensive discussion[41] of the legal traditions of participating countries. There is no need for going into how these affect the creation and application of regulations in general or how individual components such as applying a standard do not necessarily produce the same regulatory result simply because the same standard is applied.

[39] Schönenfeldt (ed.), Oxford 2017

[40] Further elaborated above in part 5.2. Short presentation of institutions with responsibility for the regulation of petroleum operations in Arctic nations

[41] More thorough assessment of these legal challenges is carried out in e.g. *Comparing Legal Cultures*, Søren Koch, Knut Einar Skodvin og Jørn Øyrehagen Sunde (red.), 2017 'Fagbokforlaget' and The Oxford Handbook of Comparative Law, Mathias Reiman and Reinhard Zimmerman (Eds), (2008) Oxford University Press,

If a standard is applied for regulatory purposes in order to achieve a certain result, this will regularly result in that a separate process, separate entailing a different legal approach will have to be applied in jurisdictions not belonging to the same legal tradition.

The civil law tradition based on, among other things, Roman law, is used by the Northern European states but with clear alternative forms of legal development and application. The Nordic countries have developed their special approach as an offshoot of this civil law tradition. Although in these countries, they have refrained from establishing a *civil code* known both from German and Latin traditions.

The Nordic countries are all characterized by sector specific legislation such as the Petroleum Act interwoven with generally applicable legislation with sector-wide application, such as the Public Administration Act, combined with sector-specific legislation, e.g. the Petroleum Act. Jurisprudence, and often official, extensive preparatory documentation submitted in support of law proposals, are of particular importance in the Nordics. Other sources of law are also important, though not holding as prominent a position as those just mentioned.

The Nordic tradition differs from others, including continental civil law. In continental civil law, development of laws is generally not supported by comprehensive commentaries and legal literature and expert opinions are given much greater weight and attention as a legal source.

If we move to *common law*, the foundation for the development of law is different. The principles governing the relationship between state and individual are also different. The development of binding norms and enforcement are based on other assumptions. Court decisions are a cornerstone in determining the law, or for gradually developing *common law*. In the United Kingdom, this tradition was completely dominant until the country joined the EU.

The EU's steady development has also forced the purists of the British judiciary into an ever-increasing amount of formalized material and procedural legislation [After Brexit this is likely to change]. Something that has created an increasing amount of secondary legislation. In *common law*, however, preparatory work to (primary) legislation is more modest than is usual in the Nordic countries.

Dispute resolution mechanisms in *common law* also deviate from the homogeneous organization of courts, especially if compared to Norway. Such differences in turn affect how regulations are developed and enforced.

The English *common law* system was exported to British colonies and overseas territories. The legal tradition was therefore further developed in the United States[42] and in parts of Canada. Both the United States and Canada are federal states, but with a different allocation of legislative competence and enforcement traditions than what we find among countries in Europe.

In the United States, as clearly expressed by the fact that US law is primarily "state law" where only specific issues are subject to federal jurisdiction. Offshore petroleum operations that is the focus here is subject to federal expertise[43]. Unlike various continental systems with extensive use of special courts, the US court system is more akin to the Norwegian system with general-purpose courts. Nevertheless, this is where the similarity stops. The widespread use of juries also in civil cases (especially in federal courts) and the limited judicial instruction by the judge towards the jury generates need to develop law differently.

[42] See an introduction to US law in *American Law In a Global Context The Basics*, George P. Fletcher and Steve Sheppard, 2005, Oxford University Press

[43] Ibid. p. 5 initial phrases in the last chapter which expresses: *"American law is basically state law. Federal law –that is, national law –is reserved for certain well defined areas."*

A final, but significant difference, between jurisdictions is the varied practices with regard to delegation of administrative authority. The extent and content, as well as the degree of intervention by a superior authority directed towards a lower level institution varies. It may have different foundations, varying ways of practise and approaches when being exercised. Even though the standards or rules applicable may initially appear to be exercised similar, the regulatory result may not be the same.

5.3 Comparative analysis

As the project covers different legal traditions, it means that norms that appear identical may represent different material content. Therefore such norms may be practiced differently in the jurisdictions concerned.

Because the legal method is different among participant. SVW has deliberately chosen to use *comparative analysis* rather than *comparative method* when describing the work performed.

Comparative method within law is challenging. What is the *appropriate* method is discussed heavily in theory. When SVW refers to the comparative analysis, the purpose is to compare different legal systems based on the authorities' reported understanding of their own system. This will assist readers to see where it may be room for a common approach. An emphasis on similarities and differences may provide a basis for changes in legislation inspired by legislation of another country. Perhaps the most important aspect in relation to the content of this report is to increase the understanding of why there are such divergence in approach. This is not just about political guidance; it is equally about the legal methods and traditions applied.

By using the term *comparative analysis*, the emphasis is to compare different countries' legal systems based on the authorities' understanding of the content of their own regulations, institutions and their approach to using standards.

5.4 Authorities responsible for petroleum operations in the contributing Arctic nation states

5.4.1 *Canada*

Canada is a federal state with ten *provinces*. In addition, Canada has three *territories*. The indigenous population has special rights to, among other things, the petroleum resources. These rights apply to coastal areas such as enclosed bays and coves. The provinces have considerable internal governance autonomy. The territories are in practice subject to more federal governance intervention, but indigenous peoples, in particular have been granted rights in specific areas, including with regard to natural resources in areas relevant to this report.

Unlike the individual states of the United States, Canadian provinces, partially exercise coastal jurisdiction over the ocean seaward of territorial waters. Such "shared" level jurisdiction is organized in different ways. The cooperation may be in the form of cooperation between federal and provincial authorities (for specified waters off the relevant coastline), or through special agencies established and acting in part independent of the federal and sub-federal or concurrent authorities. There are also separate cooperation agreements with the indigenous peoples for the territories.

This system is relatively complicated, with a number of jurisdictions, and regulations that are different to a greater or lesser extent. However, for upstream petroleum operations offshore, initiatives have been taken to achieve more uniform rules across the jurisdictions (see, among others, Chapter 7.2).

The key institution at the federal level is the Canadian Energy Regulator abbreviated CER[44]. Until August 28, 2019, the institution was named "*National Energy Board*" (NEB) [45]. Many of the quotes included below will therefore refer to NEB as these were received before the change took place. The institution has jurisdiction over a large part of Canada's offshore areas located in Arctic regions (see areas marked in pink in Figure 9 - *map with overview of the various petroleum jurisdictions Canada*).

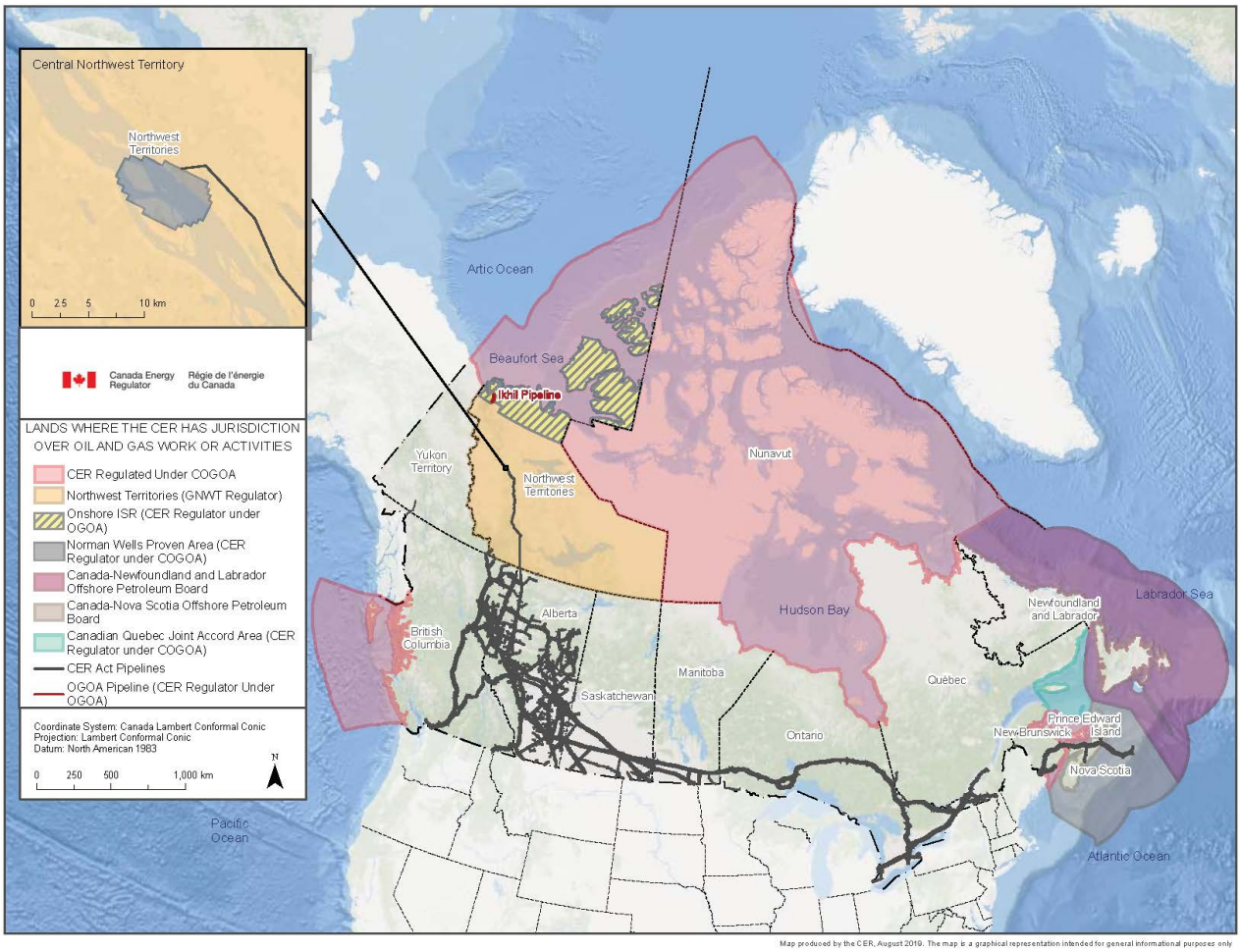


Figure 9 - map with overview of the various petroleum jurisdictions Canada

CER is responsible for the regulation, compliance monitoring and enforcement of inter alia HSE issues related to offshore petroleum operations in large parts of Arctic Canada as well as other areas (question A1).

Competence is rooted in various laws, but the bulk with relevance to offshore petroleum operations in the Arctic is rooted in the *Canada Oil and Gas Operations Act* ("COGOA")[46]. CER's expertise is also based on *the Northwest Territories Oil and Gas Operations Act* (OGOA) [47]. However, petroleum operations in this area are largely carried out onshore or in adjacent areas, such as bays and coves. In terms of the working environment, CER's competence is rooted in the "*Occupational Safety*" chapter of

[44] http://www.cer-rec.gc.ca/index-eng.html

[45] https://www.neb-one.gc.ca/index-eng.html

[46] https://laws-lois.justice.gc.ca/eng/acts/O-7/FullText.html

[47] https://www.justice.gov.nt.ca/en/files/legislation/oil-and-gas-operations/oil-and-gas-operations.a.pdf

the Working Environment Act "*Canada Labor Code*" abbreviated CLC in its Part II[48] and in the regulation "*Oil and Gas Occupational Safety and Health Regulations*" (questions A2 and A3) [49].

CER's authority does not apply to petroleum operations in the offshore areas of Nova Scotia or Newfoundland and Labrador. The areas described are, to varying degree, considered part of the Arctic depending on the definition used (see map included as Figure 2 - *illustration of various definitions of the Arctic*). Agreements have been established between the federal and sub-federal level with the establishment of administrative bodies; respectively the *Canada-Nova Scotia Offshore Petroleum Board* and *Canada-Newfoundland and Labrador Offshore Petroleum Board* (there are also others but not related to areas with more or less Arctic characteristics and these have therefore not been listed).

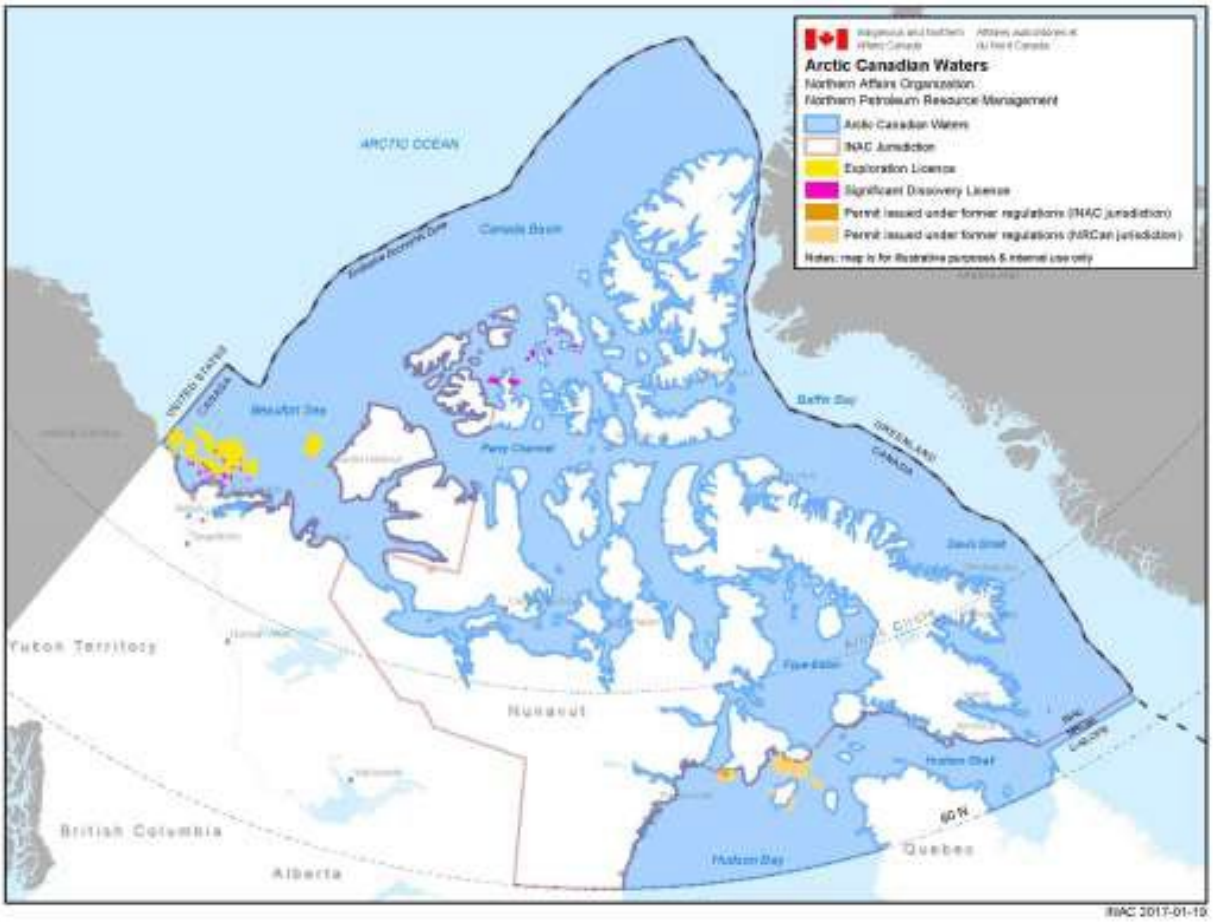


Figure 10 – areas subject to the jurisdiction of Crown-indigenous Relations and Northern Affairs Canada and NRCan

In addition to CER (Question A1 continued), other relevant institutions responsible for petroleum operations include the *Crown-Indigenous Relations and Northern Affairs Canada* abbreviated CIRNAC[50] and *Natural Resources Canada* abbreviated NRCan[51]. Both are responsible for *rights and land tenure management* and *issuance (licensing), and royalties*. The allocation of authority between institutions is geographically delineated. Only the first mentioned of the two bodies exercises authority

[48] https://laws-lois.justice.gc.ca/eng/acts/L-2/index.htm

[49] https://laws-lois.justice.gc.ca/eng/regulations/SOR-87-612/index.html

[50] https://www.canada.ca/en/crown-indigenous-relations-northern-affairs.html

[51] https://www.nrcan.gc.ca/home

in areas that internally is defined as *Arctic Canadian Waters* (see map included as Figure 10 - *areas under the jurisdiction of Crown-indigenous Relations and Northern Affairs Canada and NRCan*).

The *Inuvialiut Lands Administration* also exercises petroleum regulatory authority in what Canada defines as Arctic, but the authority primarily encompasses areas defined as onshore and any offshore operations primarily occur in confined coves and bays (see Figure 10 - *Inuvialuit Settlement Region in Canada*).

In Canada, it may be useful to map experiences or practices from bodies other than CER. In responses received from the Canadian authorities, no details have been provided as to the nature and frequency of how any exchanges of experience is shared among the various internal jurisdictions.

It follows from the above that CER is responsible for both resource management and HSE in the areas it exercises authority. This is different from the system in the United States that has two separate institutions for respectively resource management and HSE, as explained in the next section.

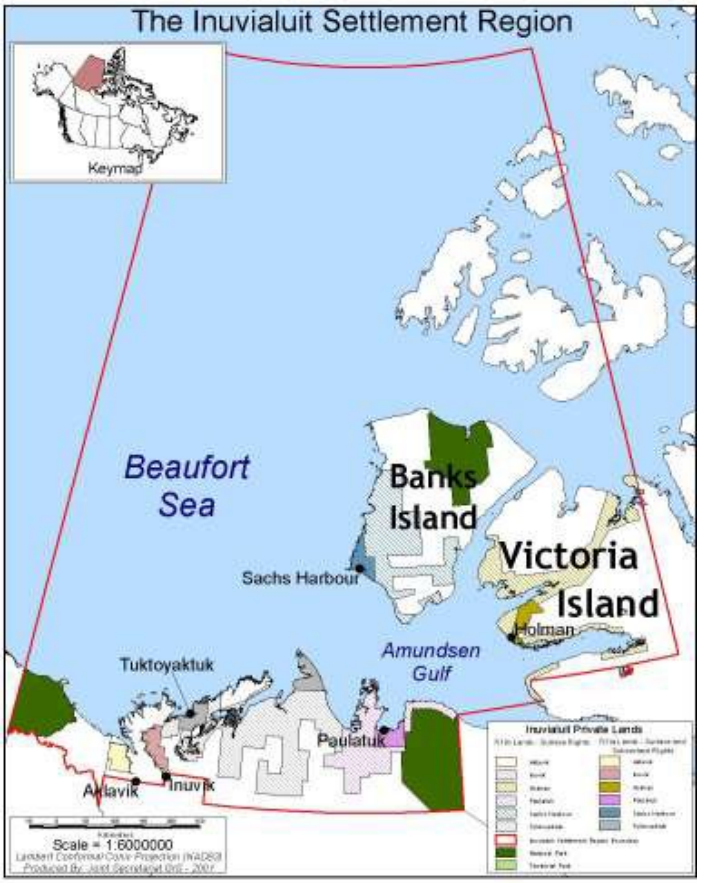


Figure 11 - Inuvialuit Settlement Region in Canada

5.4.2 *United States of America*

The main government institution regulating HSE aspects for upstream petroleum operations in the United States is the *Bureau of Safety and Environmental Enforcement* abbreviated BSEE[52].

The following quote contains the statement from the United States' authorities concerning their regulatory role (question A1):

> *"BSEE is charged with regulating energy operations on the Federal Outer Continental Shelf (OCS). This includes petroleum drilling and production activities, as well as other types of energy development.*
>
> *The Federal OCS generally is defined as those areas located more than 3 miles from the U.S. coast. The individual coastal States have jurisdictional responsibility over regulating operations occurring within 3 miles of the coast (state waters). A major exception to this is BSEE's responsibility for regulating oil spill preparedness planning, which extends to operations occurring within the state waters*
>
> *Regulation of maritime safety and vessels used during the petroleum activities fall under the auspices of the U.S. Coast Guard (USCG). The responses herein do not include regulations and standards enforced by the USCG."*

Regarding HSE regulation, United States' authorities stated the following (Questions A2 and A3):

[52] https://www.bsee.gov/

"Safety regulation for Arctic operations on the Federal OCS falls under the same general organization as above (BSEE and USCG). Operations in state waters fall within the regulatory authority of the State of Alaska, though BSEE still has responsibility for oil spill preparedness planning for operations in state waters.

***Supervision and enforcement** of safety and emergency preparedness on the Federal OCS are the responsibility of BSEE and USCG. Operations in state waters fall under the regulatory authority of the State of Alaska, though BSEE still has responsibility for oil spill preparedness planning for operations in state waters.*"

Also in the United States, the jurisdiction over the oceans is split (with some exceptions) between the federal and state level. Unlike Canada, the delineation of authority is simpler in structure and more clearly set out. Generally the allocation of authority is limited to the boundary of the territorial waters[53] - seaward of this boundary federal jurisdiction applies, whereas landward of the territorial boundary, state jurisdiction applies. In relation to Arctic, offshore operations (resources), one may for the purpose of the analysis in this report, in most cases rely only on the BSEE experience. However, the state of Alaska also plays an important role as most of the activities in the greater Prudhoe Bay area (see Section 3.2.3) are within the three nautical mile of the coast.
The other main body regulating upstream petroleum operations in the United States is the *Bureau of Ocean Energy Management* abbreviated BOEM. The agency has the primary responsibility for resource

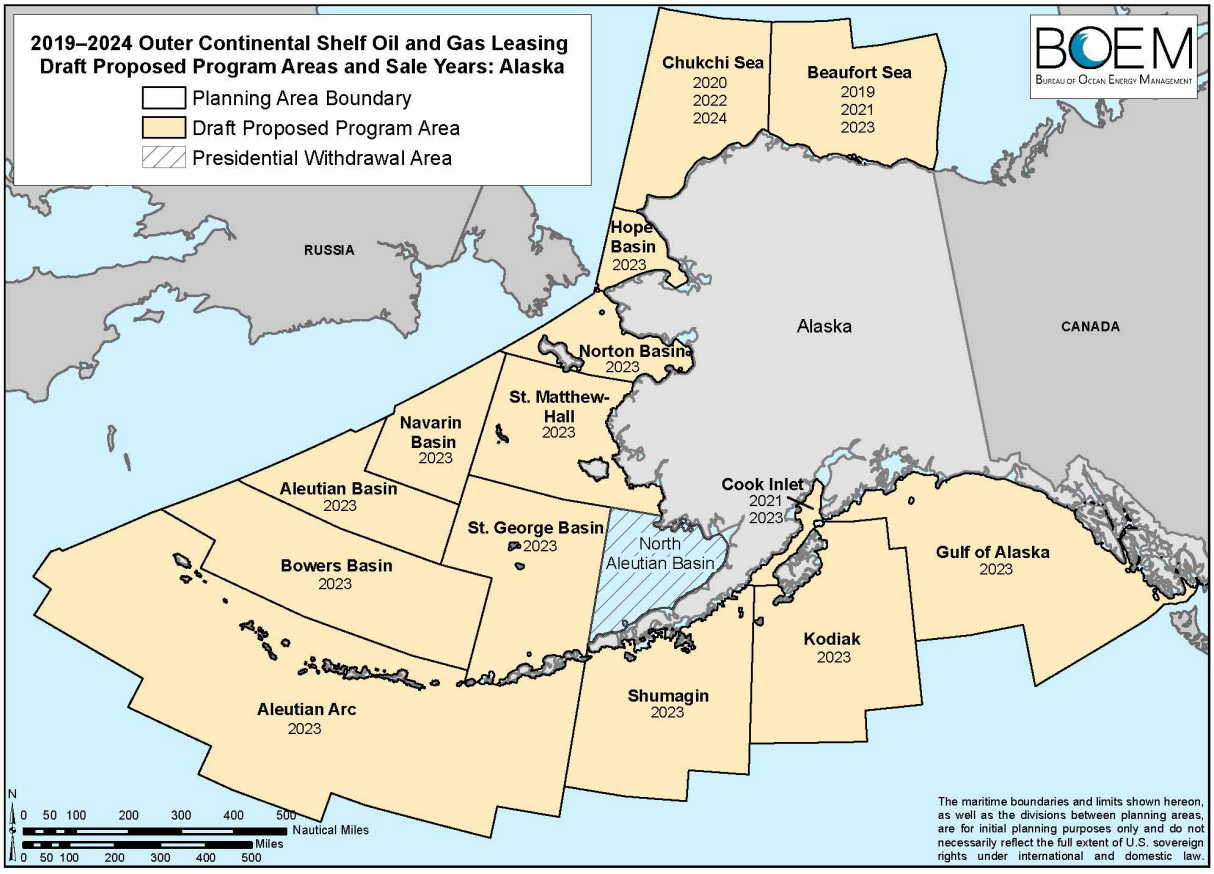


Figure 12 – outer continental shelf USA – Alaska - BOEM – draft partitioning

[53] Three nautical miles (ca. 5.6 km) from the base line, the exceptions being the coast of Texas and the West Coast of Florida were the boundary is three "marine leagues" from the base line (about 16.2 km). However, these exceptions are not relevant for the Arctic areas. See https://www.boem.gov/oil-gas-energy/leasing/federal-offshore-lands

management outside the three nautical miles boundary (referred to as the *U.S. Outer Continental Shelf*). In their response to the Questionnaire, BOEM describe itself as (question A1):

> "*BOEM manages development of U.S. Outer Continental Shelf energy and mineral resources in an environmentally and economically responsible way.*"

Splitting government responsibility for offshore areas subject to federal jurisdiction between BOEM and BSEE respectively came because of the of the Macondo accident evaluation. Below is a draft map showing the contemplated breakdown of the offshore areas around Alaska for possible future petroleum operations (see Figure 12 - *outer continental shelf USA – Alaska - BOEM – draft partitioning* – previous page).

5.5 Approach to regulations of petroleum operations in respondent Arctic nation states

5.5.1 *Relevant background law in Canada*

In Canada, COGOA and associated regulations[54] essentially govern the Petroleum Law. Rules related to the working environment and licenses are not comprised by COGOA (question B1).

The allocation of petroleum rights is as follows (question B2):

- "*Licencing confers (a) the right to explore for, and the exclusive right to drill and test for, petroleum; (b) the exclusive right to develop those frontier lands in order to produce petroleum; and (c) the exclusive right, subject to compliance with the other provisions of this Act, to obtain a production licence. (emphasis added). Such licences do not confer the right to undertake any work or activity for which an authorization is required from the regulator for each work or activity proposed to be carried out in the licence area under COGOA. It is noted that a licence is not required to undertake non-exclusive geophysical operations (e.g., marine seismic activities) in an area and a COGOA authorization is required;*
- *Where jurisdictions overlap with the COGOA legislation/regulations, the lead agency is the NEB. Ambiguity of coordination can be addressed through Memorandum of Understanding (MOUs);*
- *Where permits, etc. do not overlap with COGOA requirements, the agency is free to enforce their requirements; and*
- *Common laws of Canada, such as the Criminal Code, are applicable where Canada has jurisdiction.*"

In an HSE perspective, the *Occupational Safety* chapter of the *General Working Environment Act CLC Part II*, as well as the *Oil and Gas Occupational Safety and Health Regulations,* regulate the working environment.

COGOA's petroleum regulations cover various topics, such as diving, geophysics (including seismic, etc.), drilling and production, installations (including physical requirements for diving, drilling, production and accommodation), administrative sanctions, financial requirements and more.

In the Questionnaire, Canadian authorities have classified their own petroleum regulations as *prescriptive in nature*. Exception to this is primarily found in the regulation *Canada Oil and Gas Drilling and Production Regulations'* approach stated to be mainly functionally structured.

[54] https://laws-lois.justice.gc.ca/eng/acts/O-7/index.html#r3lR3g

Canadian Petroleum Law further is founded on a permit and license system, cf. COGOA sec. 5 "*Operating Licenses and Authorization for Work*". The authorities possess discretional authority to set terms in permits authorized by COGOA. The terms may be subject to compliance with certain standards.

The Petroleum Authority CER carries out compliance monitoring and governs petroleum operations through a system of *authorizations* and (subsequent)| permits. Regulatory activities include review of applications and (actual) operations with the aim of ensuring that petroleum operations are carried out safely and that the environment is not harmed. It also focuses on that the operator has routines in place to follow up any incidents.

5.5.2 *Relevant background law in the USA*

BSEE regulates petroleum operations in maritime areas outside the waters subject to the various states' jurisdictions. The area is referred to as the "*Federal Outer Continental Shelf*" abbreviated as "*Federal OCS*". The waters beyond the coastal waters jurisdiction of the state of Alaska form the Arctic part of the Federal OCS and are included in BSEE's jurisdiction. The three central laws that apply to this jurisdiction are (Question B1):

- "*the Outer Continental Shelf Lands Act*"[55] abbreviated OSCLA;
- "*the Oil Pollution Act of 1990*"[56] abbreviated OPA 90; and
- "*the National Environmental Policy Act*"[57] abbreviated NEPA.

BSEE stated the following with regard to regulations (Question B1 continued):

> "P*ursuant to these laws and other federal laws, including the Administrative Procedure Act (APA) (U.S. Code Title 5, Chapter 5, 500 et seq), regulations governing operations to develop the OCS energy resources in an environmentally-responsible and safe manner are promulgated and codified in the U.S. Code of Federal Regulations (CFR), specifically Title 30 sections 200 to 299.*
>
> *OCSLA recognizes that the OCS is a national resource that the Federal government holds for the public, and that it should be made available for expeditious development in a way that is safe, environmentally responsible, and recovers the maximum amount of resources.*
>
> *NEPA makes sure that all branches of government give proper consideration to the environment prior to undertaking any major federal action that significantly affects the environment.*"

Regarding the last point about NEPA above, BOEM stated that:

> "*We would clarify that NEPA applies to Federal actions (not all branches of government) (...)*"

BOEM also emphasizes that (question B1 continued):

> *"Pursuant to the Oil Pollution Act of 1990 (33 U.S.C. §2701 et seq.), BOEM requires designated applicants to maintain continuous oil spill financial responsibility coverage for all leases, permits, and right-of-use and easements with covered offshore facilities. (...)"*[58]

In the initial BSEE answer, it is further stated (question B1 continued):

[55] U.S. Code Title 43, Chapter 29, 1301 et seq – may be searched here: https://uscode.house.gov

[56] U.S. Code Title 33, Chapter 40, 2701 et seq – may be searched here: https://uscode.house.gov

[57] U.S. Code Title 42, Chapter 55, 4321 et seq – may be searched here: https://uscode.house.gov

[58] For details see 30 "Code of Federal Regulations" 553

> *"OPA 90 established a trust fund to clean up oil spills when the responsible party is unable or unwilling to do it, requires oil storage facilities and vessels to submit plans on how to respond to discharges, and requires the development of area contingency plans to prepare and plan for oil spill response on a regional scale.*
>
> *The APA governs the process by which federal agencies develop and issue regulations. It is designed to ensure that the Federal government make decisions that are consistent, transparent, and consider stakeholder input. It also provides mechanisms for judicial review for a person who has been impacted by an agency's action."*

The regulations issued by BOEM are included in "*Code of Federal Regulations in Title 30, Chapter V (500-599)*" [59].

On the interaction between general legislation and individual decisions, the following is stated (question B2):

> "*All administrative actions and decisions are derived from authorities, explicit or discretionary, granted by law in order to fulfill the mandate of the OCSLA. Laws are enforceable. Regulations are designed to implement the law, and are also enforceable. Permits are for specific actions to be undertaken by operators (permits to drill, for example). Permits may have additional conditions specific to the particular lease, environmental conditions, well or reservoir profile. Notices to Lessees (NTL's) provide guidance and are not enforceable.*
>
> *For example, BSEE included additional requirements (not from industry standards) in Shell's 2012 and 2015 drilling permits related to wildlife, subsistence issues, and ice operations*."

Following the initial answer, BOEM has added (question B2):

> "*BOEM requires exploration plans and development and production plans to include a description of how exploratory drilling activities will be designed and conducted in a manner that accounts for Arctic OCS conditions and how such activities will be managed and overseen as an integrated endeavor (30 CFR 550.220(c)(1)). The operator must also describe its plans for responding to and managing ice hazards and weather events and its ice and weather alert procedures (30 CFR 550.220(c)(2)).*
>
> *BOEM requires exploration plans and development and production plans to include shallow hazards assessments of any seafloor and subsurface geologic and manmade features and conditions that may adversely affect drilling operations, in accordance with 30 CFR 550.214(f) and 30 CFR 550.244(f).*
>
> *These plans must be approved by BOEM*."

The US respondents describe the country's legal approach to regulating the upstream petroleum sector (question B3) in the following manner:

> "*BSEE has been transitioning from a predominantly prescriptive regulatory system by incorporating more performance-based requirements, recognizing the need to maintain a system that is a hybrid of the two.*

[59] Of particular relevance is part 500 to 585 which is found here: https://www.law.cornell.edu/cfr/text/30/chapter-V/subchapter-B

> *A prescriptive system can stifle innovation, while a pure performance-based system limits the ability of the regulator to act preemptively in certain situations. At the same time, BSEE's regulations have provisions that allow operators to submit requests to use alternate procedures or equipment when they can demonstrate that a procedure or piece of equipment will provide equivalent or better safety and environmental protection. This provision creates opportunities for using new technologies and processes, which are reviewed on a case-by-case basis. (...)"*

However, a significant difference from Canadian regulatory technique is the extensive number of standards directly applied to upstream petroleum operations. The report comments further on this below.

All applicable legislation is available on the Internet, and there are no restrictions on the use of posted material (question B4).

6 Development of standards for petroleum operations

6.1 Overview

There is no standard for developing standards. They are initiated, developed, consulted and decided. Who may be involved in the development varies; however, there are some common features.

6.2 How are standards formed?

6.2.1 *Introduction*

Standards with relevance for this report are developed either nationally, emerge because of multilateral cooperation or through international organisations. Most countries have their own standardization bodies. Some are typically recognized in general, while others are recognized for specific industries or activities.

Standards regularly appear due to cooperation between national standardization bodies and international bodies. ISO has already been mentioned above. ISO standards are constantly being developed based on national standards. Below is an overview of the main standardization bodies in the two countries that provided substantial feedback to the distributed Questionnaire.

6.2.2 *Canada*

Canada's national standardization authority is the Standards Council of Canada.[60]

In the past, mainly the *Canadian Standards Association* abbreviated CSA, served as the accredited institution for the development and publication of Canadian industry standards - including for petroleum operations[61]. However, CSA is now organized as a group called *CSA Group*, where CSA standardization development is *Not-for-Profit*, while a number of other activities have become commercialized. CSA Group is also accredited with ANSI in the United States (see 6.2.3 below).

In principle, anyone may suggest to the CSA Group which standards to develop. The participants contributing to standard development are usually interest groups that are affected by regulatory development, such as trade, industry, government, academia, research bodies and unions.

The organization has a *steering committee* that sets the agenda for the development of standards and establishes interdisciplinary working groups to ensure balance of interests and technical expertise. Draft standards undergo consultation. Relevant authorities participate in all stages and parts of the work.

Canada's policy is to participate actively in ISO, and ISO standards are routinely assessed for inclusion in or adaptation to national standard(s). In special cases, regional annexes may be adopted that reflect special local conditions, for example, to reflect the unique conditions prevailing in the Arctic.

When it comes to offshore petroleum operations, there has been a particular focus on petroleum and on offshore installations[62], various management systems (for example, process safety[63]) and the working environment dimension of HSE. [64]

[60] https://www.scc.ca/

[61] https://www.csagroup.org/

[62] https://www.csagroup.org/standards/areas-of-focus/petroleum-natural-gas/

[63] https://www.csagroup.org/standards/areas-of-focus/management-systems/

[64] https://www.csagroup.org/standards/areas-of-focus/occupational-health-safety/

6.2.3 *USA*

The United States does not have a national standardization authority.

American National Standardization Institute abbreviated ANSI is the United States' most generally oriented standardization body. The Institute is an umbrella organization that also represents the United States in ISO. The following description is given on their own website:

> "*ANSI is a private, not-for-profit organization dedicated to supporting the U.S. voluntary standards and conformity assessment system and strengthening its impact, both domestically and internationally*."

Furthermore, it is stated that the general strategy for the development of standards is[65]:

> "t*he U.S. standardization system reflects a market-driven and highly diversified society. It is a decentralized system that is naturally partitioned into industrial sectors and supported by independent, private sector standards developing organizations (SDOs). It is a demand-driven system in which standards are developed in response to specific concerns and needs expressed by industry, government1, and consumers. And it is a voluntary system in which both standards development and implementation are driven by stakeholder needs.*"

The main contributor developing standards relevant to upstream petroleum operations in the United States is the *American Petroleum Institute* abbreviated API (see more about the comprehensive use of API in the US petroleum industry in section 7.3 below).

There are a number of other standardization organizations active in the United States. Among the most relevant to petroleum operations, other than the above, are the *American Society of Mechanical Engineers* and *American Society for Testing and Materials*. Both these bodies have developed standards that are directly applicable for the petroleum sector through the reference in US Regulation 30 CFR 205.198 (see 7.3 below also here).

[65] https://www.standardsportal.org/usa_en/standards_system.aspx

7 Description of regulation techniques – the relationship between public law and use of standards

7.1 About regulations strategies and regulation techniques

Regardless of the nature of an activity, legislatures and regulators face several dilemmas in establishing binding norms and enforcing them. This applies to HSE as in all other subject matters.

Rules need to be suitable for governing the sector and directing activities so that the operations are carried out in a responsible manner. If the purpose of a rule is not to outright prevent any activity, the rules must be designed to enable soundly organized and operated business activities.

The regulatory strategy in any jurisdiction is influenced by the nature of the regulated business, as well as where activities are conducted. The regulation strategy will naturally influence the choice of regulation technique.

Standards are used as a regulatory technique in various ways as part of various regulatory strategies. Regulatory strategy and regulatory techniques are significantly influenced by the state's organization and not least its constitutional and legal tradition. Section 5.2 above comments generally on legal traditions and indicates the importance of legal tradition when considering the development and implementation of regulatory measures.

The project description from the Petroleum Safety Authority Norway requires the examination of defined parameters, the application of standards when regulating safety aspects of offshore petroleum operations. As addressed in section 1.3 of the report *Overall professional framework*, particular attention is paid to the regulation of the operations when conducted in offshore areas beyond the territorial waters of coastal states. The factual and legal differences between offshore and onshore will affect regulatory strategy. It will also affect how the use of standards as part of such strategy is implemented in practice. As SVW addresses offshore petroleum operations, section 1.6.3 of the report discusses some important basic and common public international law principles that also affect the exercise of coastal state jurisdiction in relation to flag state jurisdiction. These are also factors that influence regulatory strategy and techniques, but which are resolved differently by coastal states.

Within the mandate given by the Petroleum Safety Authority Norway and the time available for completing the project, it would not be possible to engage and to discuss the theoretical basis for the choice of regulatory strategy and regulatory technique used by the respondents[66]. It would also be too all embracing to discuss the regulatory strategies that underpin the petroleum regulatory safety regime in the Arctic states. Even so, the techniques, the respondents have chosen to apply, will be described briefly in the following.

7.2 Canada – regulation technique and approach

The working environment dimension of HSE is regulated by the CLC as stated above. It is further mentioned that, for the most part, CLC refers to standards prepared by the largest Canadian standardization body, the CSA Group.

The Canadian Petroleum Act - COGOA - does not i refer directly to standards, but the Act explicitly regulates the relationship between public law regulations and the use of standards.

The Act allows the incorporation of standards or other types of specifications into regulations pursuant to the Act.

[66] See *Understanding Regulation Theory, Strategy, and Practice*, Robert Baldwin, Martin Cave and Martin Lodge, Second Ed. (2012), Oxford University Press. The authors in particular remark on *Standards-setting on pp*. 109-110.

It follows from COGOA section 14 (2) that government has the authority to ensure such incorporation:

> *"Unless otherwise provided in this Act, regulations made under subsection (1) may incorporate by reference the standards or specifications of any government, person or organization, either as they read at a fixed time or as amended from time to time."*

As an example, this regulation technique is frequently used in the regulation *Canada Oil and Gas Installation Regulations.*[67]

Section 30 on *Firefighting Equipment* illustrates this:

> *"(1) Every manned offshore installation shall be provided with at least ten sets of firefighter equipment and every unmanned offshore installation shall be provided with at least two sets of firefighter equipment, each of which shall consist of*
>
> *(a) protective clothing, including boots and gloves, that*
>
> *(i) meets the requirements of National Fire Protection Association 1971,* ***Standard on Protective Clothing for Structural Fire Fighting****,*
>
> *(ii) will protect the skin from being burned by heat radiating from a fire and by steam,*
>
> *(iii) has a water-resistant outer surface,*
>
> *(iv) in the case of boots, is made of rubber or other electrically non-conducting material, and*
>
> *(v) in the case of gloves, meets the requirements of National Fire Protection Association 1973,* ***Standard on Gloves for Structural Fire Fighting****; and*
>
> *(b) a firefighter's helmet with visor that meets the requirements of Canadian Standards Association CAN/CSA-Z94.1-92,* ***Industrial Protective Headwear****."* (The original text uses bold for highlighting.)

From the text cited above, it appears that the regulation reproduces the name of the standardization body, and specifically identifies which standard is applicable.

Other practical examples of exceptions to the principle of not making standards into mandatory rules provided by the Canadian authorities include:

> *"CAN/CSA-Z662-15 Oil and gas pipeline systems for offshore pipelines;*
> - *CAP 437 Standards for Offshore Helicopter Landing Areas as published by the UK Civil Aviation Authority.in relation to helicopter facilities and operations;*
> - *International Maritime Organization MODU Code or the Intact Stability Code for floating platforms, and references to other regulations (e.g., Life Saving Equipment Regulations, Ship Station Radio*
> - *Regulations, Collision Regulations, Ship Station Radio Regulations, Ship Station Technical Regulations VHF Radiotelephone Practices and Procedures Regulations which in turn may refer to specific standards;*
> - *Canada Oil and Gas Certificate of Fitness Regulations, has provisions of a Certificate of Fitness, for floating installations and vessels, issued by a Certifying Authority regarding it fitness for purpose. The scope of work for a certification plan is approved by the Chief Safety Officer. Standards may form part of the certification plan."*

[67] https://laws-lois.justice.gc.ca/eng/regulations/SOR-96-118/index.html

The rules are often, but not always, supplemented by guidelines. Guidelines provide indications of acceptable safety levels referred to as *acceptable compliance*. By including references to standards, an indication is provided as to what is required in order to comply with the relevant piece of legislation.

COGOA specifies the relationship between such guidelines and other regulations. COGOA section 5 (3) *Guidelines and Interpretation Notes* explicitly states that such reference to standards is not to be regarded as formal legislation as defined in the Statutory Instruments Act.

This understanding is confirmed in the response[68] received from Canada where it is stated that:

> "*Standards are typically incorporated by reference in Guidelines, but Guidelines are not statutory and enforceable on their own*".

Through *explicit* reference in law, some standards may also achieve formal public law status, but without such reference, standards will not be considered part of petroleum legislation as such.

Canadian authorities state that they in general are trying to avoid imposing mandatory application of specific standards in petroleum regulations.

This approach is central to the development of the so-called *Framework Regulations* being drafted. The approach is based on a *policy decision* involving several Canadian authorities at the federal and provincial levels[69]. These regulations are currently being prepared. The approach seems to have a limited impact on standard use in regulations by the summer of 2019: Only one standard - CSA Z662 – applicable to "*pipelines*" – has been referenced so far.

The work on new set of rules illustrates to some extent the challenges Canada has with relatively numerous jurisdictions exercising sector authority below the federal level. The aim is to merge five existing regulations for *drilling and production, geophysical activities, certificate of fitness, licenses and facilities*. The goal for new common regulations for Canadian jurisdictions participating in the work is to:

- "*Update safety and environmental protection requirements to ensure our regulations remain world-class*
- *Reduce multi-regulation redundancy*
- *Shift to a hybrid regulatory approach with a balance of prescriptive and performance-based requirements*
- *Support consistency across jurisdictions*
- *Ensure an effective and efficient regulatory regime"*

7.3 United States of America - regulation technique and approach

Above (see section 5.3.2), SVW indicated that the Macondo accident had a significant effect on the United States approach to regulating offshore upstream petroleum operations. In addition to the formation of the two, new authorities BSEE and BOEM, regulatory technique itself was also changed.

Through the implementation of the *Safety and Environmental Management Systems rule*[70] ("SEMS") in 2013, functional requirements were introduced. At the same time, a number of API standards were changed from voluntary to mandatory:

[68] Reply D4, last bullet point

[69] https://www.nrcan.gc.ca/our-natural-resources/energy-sources-distribution/clean-fossil-fuels/offshore-oil-gas/forri/17729

[70] https://www.bsee.gov/site-page/fact-sheet

> "*The SEMS rule administered by BSEE differs from all other rules enacted under OCSLA because it directly addresses the safety management responsibilities of operators in a performance-based rule that requires operator conduct of twelve broadly defined safety management functions. It is featured and extensively discussed in all major post-Macondo reports that address the need for improving the accident prevention regime. SEMS adopts and makes mandatory the voluntary management practices of API's Recommended Practice (…). As a result, the rule also incorporates by reference and makes mandatory and enforceable the multitude of other API voluntary standards that API had advised operators to follow at their discretion in implementing [API RP 75[71]]. Thus it can be said that SEMS encompasses these ancillary API standards and in doing so replaced API use of words like "should" and "may" with the BSEE word 'must.'"*[72]

In its response, the BSEE includes the following information regarding their approach to standardization (question D1):

> *"BSEE's regulations can incorporate by reference industry standards that have been promulgated by standards-development organizations. Most notably, this includes technical and process standards from the American Petroleum Institute (API), as well as from other organizations with specific expertise, such as the American Society of Mechanical Engineers (ASME), the American National Standards Institute (ANSI), the International Organization for Standardization (ISO), and the American Society for Testing and Materials (ASTM). These organizations, some of which are international, set standards that establish best practices for their areas of expertise. See 30 CFR 250.198 for a list of industry standards that BSEE has incorporated by reference into its regulations."*

The number of standards that have been made directly applicable is considerable. This has been subject to industry criticism. The industry claimed in 2014 that 14,000 discretionary provisions in 80 voluntary API standards had been made mandatory[73].

In relation to how the authorities identify needs and follow up on the development of standards, BSEE responded as follows (question D2):

> *"BSEE regularly reviews and updates its regulations for energy operations on the U.S. OCS. and conducts supporting research through BSEE's Best Available and Safest Technology (BAST) determination process. BSEE regulations also establish a robust incident reporting and investigation system that is another source of information used to establish, maintain and update regulations and ground truth incorporated standards.*
>
> *BSEE participates in industry standards development committees and provides input during the standards development process. However, BSEE does not decide which standards are developed, revised, or rescinded. Standards-development organizations make those decisions."*

The *BAST Determination Process* is described by BSEE as follows (from the institution's website):

> "*BSEE has developed a three-stage process to identify candidate technologies for BAST determinations. Stage 1 of the process starts when the Director evaluates various information streams available to BSEE (incident reports, accident reports, near miss reports….) pointing*

[71] Safety and Environmental Management System for Offshore Operations and Assets
https://global.ihs.com/doc_detail.cfm?document_name=API%20RP%2075&item_s_key=00150438

[72] See "*Risk Governance of Offshore Oil and Gas Operations*" – 2014 – redigert av Preben Hempel Lindøe m.fl. – page 183-183

[73] See "*Risk Governance of Offshore Oil and Gas Operations*" – 2014 – redigert av Preben Hempel Lindøe m.fl. – page 182-183

> *towards a safety issue with critical equipment that has the potential to be addressed through the BAST Determination Process. Once an issue is identified by the agency, a Qualified Third Party (QTP) will be identified by BSEE to oversee Stage 2 of the process by evaluating candidate technologies to determine their Performance Levels (PL) through consistent and verifiable testing and evaluation of a technologies operational history. Stage 3 of the process requires the agency to conduct a Benefit Cost Analysis consistent with OCSLA to ensure candidate technologies meeting the PL provide safety, health or environmental benefits which outweigh their costs."*[74]

Alone, such a course of action only seems to contribute with preventing future undesirable incidents based on events where the full potential for damages did not materialize in the first place.

When asked what authority is responsible to assess whether to apply or recommend a specific standard (question D3), BSEE replied the following:

> *"BSEE, through its Office of Offshore Regulatory Programs (OORP), determines whether a particular standard is appropriate for incorporation into BSEE regulations to achieve a sufficient level of safety. The OORP is responsible for the management of regulatory programs and functions that engage risk assessment and analysis, the evaluation of emerging technologies, safety improvement, and the development and maintenance of up-to-date regulations, policies, standards and guidelines."*

As stated above, a number of standards are directly applicable to the part of the offshore operations for which BSEE is regulator. When asked how standards are implemented or referred to in regulations, etc. BSEE answers (questions D4 - a, b, c and d):

> *a. "BSEE does not incorporate industry standards directly."*

This means that industry standards are not included as part of regulations adopted by the federal government. However, the effect of the way the US federal government is referring to the standards is that standards de facto become part of mandatory regulations. BSEE states that the standards are applied by reference in BSEE Regulations, provided that the above procedures are followed (ref. Question D4 b).

As the approval of newer standards must go through the same procedure as described above, it may take some time from a new standard has been drafted until it is adopted as the new applicable and regulatory binding standard. A company then has the opportunity to apply for the right toe use of the newer standard. Following a case-by-case evaluation, BSEE has the authority to apply the new standard for the applicant relevant permit or license. BSEE will then apply the newer standard as basis for compliance monitoring (see question D4 c).

When asked if there are any other approaches such as recommending the use of certain standards in guidelines (ref question D4 d), BSEE responds that their

> *"overarching requirement is that the approval follow the BAST determination process"*

as described above in connection with the answer to question D2.

[74] https://www.bsee.gov/what-we-do/offshore-regulatory-programs/emerging-technologies/BAST - for ytterligere detaljer se: https://www.bsee.gov/sites/bsee.gov/files/fact-sheet/bsee-bast-determination-process-final-november-2015.pdf

In practice, this seems to mean to mean the answer to the question is no, and this points to quite a significant difference from the approach taken in Canada concerning standards application (see above in section 7.2).

The last question in this part of the Questionnaire relates to mandatory or non-mandatory application of standards. SVW has already pointed out that the mandatory application of standards to which the BSEE refers in its legislation to some extent is a hallmark of the US federal approach.

The answer to question D5 does not provide additional information beyond what has already been described above.

8 Regulation with specific relevance for Arctic petroleum operations

8.1 Canada – Arctic–specific regulations?

The NEB answers the following regarding the question if there are specific regulations for petroleum operations in the Arctic (question C1):

- *"Operational safety is regulated under COGOA, including emergency preparedness and somewhat working environment. Regulations under COGOA have varying degrees of specificity to the question.*
- *Occupational safety is regulated under CLC, including working environment as noted above.*
- *(...)"*

Together COGOA and CLC regulate emergency preparedness, the working environment and safety. Regulations pursuant to these laws contain some Arctic specific provisions.

Several of Canada's various jurisdictions plan, as mentioned in Chapter 7.2 above, to establish a common regulatory framework for selected topics. These regulatory initiatives are assumed relevant for Arctic petroleum operations as well, although the rules are generic and not specifically aimed at Arctic conditions. When asked about planned regulatory initiatives, NEB highlighted the work on FORRI (question C2):

> "*A Frontier and Offshore Regulatory Renewal Initiative – FORRI (...) aimed at modernizing the regulatory framework for frontier and offshore oil and gas activities in Canada (including areas under the COGOA (...)), has been underway since circa 2015. The current principle thrust under FORRI is to modernize and amalgamate five existing regulations (Drilling and Production; Geophysical Operations; Certificate of Fitness; Operations; Installations) into one set of operational requirements, known as the 'Framework Regulations'. This Framework Regulation is planned to be pre-published in Canada Gazette I in the spring of 2020 and potentially come-into-force in the fall of 2020. Majority of the efforts is to regulate oil and gas work or activities, including those under COGOA, in the areas administered by NRCan (...), as such it is not specifically tailored to Arctic operations*."

Different Canadian sub-jurisdictions have some specific rules applicable to Arctic operations that are intended, among other things, to safeguard indigenous peoples and other stakeholders against financial loss due to petroleum activity or pollution caused by petroleum related activity. Pollution damage rules are not normally considered part of HSE regulations. Given that the question was open-ended and that also information about other legislation relevant for petroleum operations in the Arctic was requested, the answer from NEB is included (question C3):

- "*For oil and gas work or activities in the Canadian Beaufort Sea, adjacent to the U.S. Beaufort Sea, an operator would needs to provide funding (or funding guarantees) to compensate indigenous people in the event of an incidence that may affect their traditional way of life (e.g., as a consequence of an oil spill that drifts to the U.S. side of the Beaufort Sea);*
- *For oil and gas work or activities in the Inuvialuit Settlement Region (onshore or offshore – see map in footnote ii), the applicant would need to undergo a process established in the Inuvialuit Final Agreement (...) that assesses, amongst other things, a worst-case scenario and compensation for the Inuvialuit in the event there is an incidence that may affect their traditional way of life (e.g., as a consequence of an oil spill that affects the traditional wildlife harvesting activities); and*
- *For oil and gas work or activities in the Canadian Arctic offshore (see map in footnote i) the operator may also need to comply with the Arctic Waters Pollution Prevention Act and its regulations that prescribes limits of financial responsibilities, amongst other things."*

In its response to question C3, it is also clear that NEB has considered *any other instruments of law* to include international law agreements. To some extent, it was not the intention of the Questionnaire to require respondents to reply with regard to such agreements. Regardless, NEB points out that due to the aforementioned substantial number of jurisdictions governing petroleum operations in various parts of Canada, it would be too comprehensive to provide an exhaustive answer. The response from Canada makes it clear that mapping relevant regulations for Arctic offshore petroleum operations can be quite complex, also within the individual (main) jurisdictions.

8.2 USA – Arctic-specific rules?

In practice, only the BSEE has answered the questions related to Arctic-specific rules, namely with regard to those rules that apply to the *Federal OCS*. However, BOEM has clarified that it has been taken into account[75].

To the first question, BSEE (question C1) answers:

> *"Offshore energy operations in the Arctic are not specifically referenced in the three major laws (OCSLA, OPA90, and NEPA) in which BSEE finds its authority to act.*
> *BSEE's regulatory requirements apply to operations on the entire Federal OCS. Specific requirements for Arctic drilling operations are found in BSEE's regulations in 30 CFR 250.300, 30 CFR 250.470-473. The Arctic Drilling Rule also includes regulatory responsibilities for the Bureau of Ocean Energy Management (BOEM).*
> *The key requirements for operators are:*
> - *Conducting operations in a manner suitable for Arctic OCS conditions*
> - *Access to appropriate source control and containment equipment*
> - *Access to a separate relief rig and the ability to drill a relief well within the same drilling season.*
> - *Capability to predict and respond to ice conditions and adverse weather*
> - *Effective contractor oversight*
> - *Submitting oil spill response plans (OSRP's) tailored to Arctic conditions*
>
> *BSEE is in the process of proposing revisions to the Arctic Drilling Rule. They anticipate that the updates will be completed in early 2020."*[76]

With regard to the ongoing regulatory initiative, (question C2) answers are included above. There is currently only one ongoing initiative to update regulations; the *Arctic Drilling Rule* planned for first half of 2020.

Regarding other types of legislation or legal instruments that may have an impact on HSE regulation in the Arctic, BSEE only points out in general (question C3) that

> "*All rulemakings are subject to administrative and judicial review."*

However, it is stated that the current *Arctic Drilling Rule* is subject to legal dispute procedure. It falls outside the scope of the report to go into detail about what the dispute is about, but it is appears to relate to a politically expressed desire to soften safety measures[77] introduced by the former administration[78] for exploration drilling and production in, among other areas, the Arctic waters.

[75] The bullet point "*Developing and submitting an Integrated Operations Plan (IONP) to BOEM*" was deleted following a request by BOEM.

[76] More information about *Arctic Drilling Rule* is accessible here: *https://www.bsee.gov/guidance-and-regulations/regulations/arctic-rule*

[77] https://www.nytimes.com/2019/03/30/climate/trump-oil-drilling-arctic.html

[78] https://www.theguardian.com/environment/2015/feb/20/new-safety-rules-for-offshore-arctic-drilling

For relevant legal sources (question C4), the BSEE refers to previously stated laws and regulations, i.e. *"OCSLA, OPA 90, NEPA, APA, and 30 CFR part 250*." See above in section 5.5.2.

9 Overview of standards with specific relevance for Arctic petroleum operations and HSE

9.1 Canada – Arctic-specific standards

When asked which safety standards are applicable to Arctic petroleum operations, NEB has responded with what they emphasize is a non-exhaustive list (question E1):

- "*Standard[s] that might be relevant include :CAN/CSA-ISO 19900, 19901 (-1,2,4,5, & 7), 19902, 19903,19904 (-1), 19906, and 13819-2 as well as 35101, 35103, and 35106;*

- *These standards' relevance, importance, and priority would be dependent on proposed oil and gas exploration and production drilling related applications. Currently, and since 2004, there are no oil and gas exploration [or] production drilling related application or projects in the Canadian Arctic offshore. One potential applicant for an exploration drilling project in the southern Beaufort Sea did not submit an application for consideration*."

NEB points out that CLC refers to a variety of standards on everything from personal protective equipment to chainsaws. A limited number of the provisions are relevant for the offshore petroleum sector, and even fewer specifically for the Arctic. The one provision that must be considered relevant for Arctic conditions is CLC clause 13.14, which applies to protection against extreme temperatures. This provision contains a functionally defined rule, but no reference to any standard (despite the fact that ISO has developed a standard that must be assumed to fit the purpose - see above 3.4).

For the content of the various standards applied, NEB refers to relevant internet sites[79] (question E3).

Standards referred to as response to question E1 are listed below (the year is not specified by NEB, SVW has therefore referred to the latest version where several versions are available). For simplicity, SVW has omitted the designation for nationally approved ISO standard "CAN / CSA-ISO" (question E3 continued):

- ISO 19900:2019 - Petroleum and natural gas industries – General requirements for offshore structures
- ISO 19901-1:2015 - Petroleum and natural gas industries — Specific requirements for offshore structures — Part 1: Metocean design and operating considerations
- ISO 19901-2:2017 - Petroleum and natural gas industries — Specific requirements for offshore structures — Part 2: Seismic design procedures and criteria
- ISO 19901-4:2016 - Petroleum and natural gas industries — Specific requirements for offshore structures — Part 4: Geotechnical and foundation design considerations
- ISO 19901-5:2016 - Petroleum and natural gas industries — Specific requirements for offshore structures — Part 5: Weight control during engineering and construction
- ISO 19901-7:2013 - Petroleum and natural gas industries — Specific requirements for offshore structures — Part 7: Station keeping systems for floating offshore structures and mobile offshore units
- ISO 19902:2013 - Petroleum and natural gas industries — Fixed steel offshore structures (was amended in 2013)
- ISO 19903:2019 - Petroleum and natural gas industries — Concrete offshore structures
- ISO 19904-1:2019 - Petroleum and natural gas industries — Floating offshore structures — Part 1: Ship-shaped, semi-submersible, spar and shallow-draught cylindrical structures
- ISO 19906: 2019 - Petroleum and natural gas industries **— Arctic offshore structures**

[79] Links provided by NEB: https://store.csagroup.org/ og https://www.iso.org/home.html, men se også http://www.scc.ca/en/standardsdb/

In another number series, NEB also lists the following standards:

- ISO 13819-2:1995 - Petroleum and natural gas industries — Offshore structures — Part 2: Fixed steel structures
- ISO 35101:2017 - Petroleum and natural gas industries **— Arctic operations — Working environment**
- ISO 35103:2017 - Petroleum and natural gas industries **— Arctic operations — Environmental monitoring**
- ISO 35016:2017 - Petroleum and natural gas industries **— Arctic operations — Metocean, ice, and seabed data**

Of all the above-mentioned standards, four are specifically related to the Arctic. SVW has highlighted these in **bold**. As mentioned in section 3.4, it falls outside the purpose and scope of the report to analyse the content of the standards themselves. SVW has not reviewed the standards, but has noticed that the division into different standards for steel, concrete and specific forms indicates a prescriptive approach.

In response to any anticipated updates to specific standards for petroleum operations in the Arctic (question E5), NEB refers to information available on their web pages where the standards may be found, searched and downloaded for a fee (question E4). On said web pages it will appear which year the standard above originates (as stated in the list of standards above). Finally, NEB points out that once a standard is developed they will

> "*remain evergreen through a 4-5 year review process managed by CSA and ISO*."

The use of the word "evergreen" suggests that NEB assumes that the standards organizations themselves will keep the standards up to date.

9.2 USA – Arctic specific standards

The BSEE responds the following regarding standards that may be considered Arctic specific (question E1):

> "*ANSI/API Recommended Practice 2N applies to Arctic operations.[*[80]*]*"

ANSI / API Recommended Practice 2N is entitled *Planning, Designing, and Constructing Structures and Pipelines for Arctic Conditions*. The current version is the third edition. It was released in April 2015[81]. The use is linked to petroleum operations in the Arctic and in *cold areas* where there are similar conditions with sea ice, icebergs and ice formation.

This standard is directly applicable as mandatory regulations through the reference to it in CFR 250.198. In total, there are 98 API standards incorporated into US federal law in this way (see above in 7.3). A number of other standards are also incorporated in the same way (see footnote 79 that links to all the standards that are incorporated).

When it comes to the relationship between regulations and standards, BSEE refers to the "*Arctic Drilling Rule*". This is an Arctic-specific regulation. See section 8.2 above. These regulations refer to a number of general standards, which also have direct application in the Arctic:

> "*BSEE's regulations (30 CFR parts 250 through 254) incorporate approximately 130 industry standards by reference that are specifically identified in 30 CFR 250.198. BSEE's regulatory*

[80] *See 30 CFR 250.198 (95)* - https://www.govinfo.gov/content/pkg/CFR-2017-title30-vol2/xml/CFR-2017-title30-vol2-part250.xml#seqnum250.198

[81] https://www.standard.no/no/Nettbutikk/produktkatalogen/Produktpresentasjon/?ProductID=748504

> *requirements apply to operations on the entire Federal OCS, unless otherwise specified. Also, if an operator receives approval to use an industry standard not yet incorporated in BSEE regulations or a newer version of an industry standard that has been incorporated by reference into BSEE regulations in their permit BSEE enforces compliance to that standard or version for those operations*."

BOEM has described how the rules are applied in practice in order to inter alia identify and address Arctic-specific risk factors:

> "*BOEM requires Arctic OCS exploration plans to include a description of how exploratory drilling activities will be designed and conducted in a manner that accounts for Arctic OCS conditions and how such activities will be managed and overseen as an integrated endeavor […[82]]. The operator must also describe its plans for responding to and managing ice hazards and weather events and its ice and weather alert procedures […[83]].*
>
> *BOEM requires exploration plans and development and production plans to include shallow hazards assessments of any seafloor and subsurface geologic and manmade features and conditions that may adversely affect drilling operations[…[84]]. Exploration and development and production plans must also include shallow hazard reports based on information obtained from high-resolution geophysical surveys […[85]].*
>
> *Before shallow test drilling is conducted under a geological and geophysical permit, BOEM may require operators to gather and submit seismic, bathymetric, sidescan sonar, magnetometer, or other geophysical data and information to determine shallow structural detail across and in the vicinity of the proposed test in accordance with §551.7(a) and §551.7(a)(1). For deep stratigraphic tests, operators must submit to BOEM a drilling plan that includes seismic, bathymetric, sidescan sonar, magnetometer, or other geophysical data and information sufficient to evaluate seafloor characteristics, shallow geologic hazards, and structural detail across and in the vicinity of the proposed test to the total depth of the proposed test well in accordance with §551.7(b) and §551.7(b)(1)(v)."*

BSEE does not elaborate much regarding the scope and purpose of the Arctic-specific standards (question E3):

> "*All of the BSEE regulations mentioned in E1 and E2 above aim to regulate safety elements and working environments on the Federal OCS in the Arctic*."

As regards the proposed "*Arctic Drilling Rule*", a press release from the U.S. Department of the Interior stated that the purpose of the new rules was to:

> "*focus solely on offshore exploration drilling operations within the Beaufort Sea and Chukchi Sea Planning Areas. Using a combination of performance-based and prescriptive standards, the proposed regulations codify and further develop current Arctic-specific operational standards that seek to ensure that operators take the necessary steps to plan through all phases of offshore exploration in the Arctic, including mobilization, drilling, maritime transport and emergency response, and conduct safe drilling operations while in theater*."[86]

[82] See *30 CFR 550.220(c)(1)*

[83] See *30 CFR 550.220(c)(2)*

[84] See *30 CFR 550.214(f) og 30 CFR 550.244(f)*

[85] *See 30 CFR 550.214(e) og 30 CFR 550.244(e)*

[86] https://www.doi.gov/news/pressreleases/bsee-boem-issue-proposed-regulations-to-ensure-safe-and-responsible-exploratory-drilling-offshore-alaska

Furthermore, it was elaborated that:

> "*The proposed regulations codify requirements that all Arctic offshore operators and their contractors are appropriately prepared for Arctic conditions and that operators have developed an integrated operations plan that details all phases of the exploration program for purposes of advance planning and risk assessment. With an emphasis on safe and responsible exploration, the proposed rule also would require operators to submit region-specific oil spill response plans, have prompt access to source control and containment equipment, and have available a separate relief rig to timely drill a relief well in the event of a loss of well control. The proposed rule continues to allow for technological innovation, as long as the operator can demonstrate that the level of its safety and environmental performance satisfies the standards set forth in the proposed rule*."[87]

As mentioned above in 8.2, the *Arctic Drilling Rule* is subject to judicial review. It is also mentioned that BSEE has already changed the *Well Control Rule* from 2016. New rules that apply from 2019 have removed a number of safety requirements that previously applied[88]. One source [89] summarizes the reduced requirements as follows (SVW has removed the related assessments):

- "*Eliminates provisions related to real-time monitoring of offshore wells.*
- *Removes a requirement aimed at reducing the risk of a collision between an approaching vessel (lift-boat) and a drilling platform.*
- *Eliminates government approval of third-party inspection organizations.*
- *Reduces testing requirements for important safety devices called blowout preventers, which are designed to prevent uncontrolled releases of oil from a well. Instead of requiring a 30-minute test every 14 days, the revisions would allow for a five-minute test every 21 days*."

This change is also subject to litigation[90]. It appears that the rules are not Arctic-specific, but are an indication of a changed approach to HSE issues on the US continental shelf, including in the Arctic.

For legal sources that contain standards referred to in this chapter (question E4), SVW refers to other sections of the report, as well as links to web-pages included in footnotes[91] that provide free access to API standards incorporated into regulations by reference to 30 CFR 250.198[92].

> "*For the laws and regulations, see B1 and B4 above. Most of the industry standards are available from the organization promulgating them (usually at a cost or with a paid subscription). Also, BSEE maintains a copy of each incorporated standard for public review at the BSEE office in Sterling, Virginia. As a courtesy, API makes their standards that are incorporated by reference in regulations available to the public for viewing for free […]"*

In relation to planned regulatory initiatives for the development of new Arctic-specific standards (question E5), BSEE answers:

> "*We are unaware of current or planned initiatives regarding the development of Arctic-specific safety standards.*

[87] https://www.doi.gov/news/pressreleases/bsee-boem-issue-proposed-regulations-to-ensure-safe-and-responsible-exploratory-drilling-offshore-alaska

[88] https://www.bsee.gov/guidance-and-regulations/regulations/regulatory-reform/bsee-well-control-rule-2019

[89] https://oceanconservancy.org/blog/2019/05/14/trump-administration-weakens-offshore-drilling-safety-rules/

[90] https://www.maritime-executive.com/article/suit-filed-over-well-control-rule-repeal

[91] http://www.api.org/publications-standards-and-statistics/publications/government-cited-safety-documents

[92] https://www.govinfo.gov/content/pkg/CFR-2017-title30-vol2/xml/CFR-2017-title30-vol2-part250.xml#seqnum250.198

BSEE participates in industry standards development organization committees and provides input during the standards development process. However, BSEE does not decide which standards are developed, revised, or rescinded. Standards-development organizations make those decisions. (...)."

10 Specific theme 1: Regulation of well design and drilling in the Arctic

10.1 Introduction

In section 3.1 above, SVW has pointed to specific risk factors that may apply to offshore petroleum operations in the Arctic. There are several factors in well design and drilling that may justify special requirements.

Throughout, guiding the drill string through the water column, and then drilling deep into the seabed, poses considerable risk. The drill string will drill through rocks and sediments where sub-surface conditions, pressure and heat can cause incidents with a blowout as the worst imaginable scenario. In Arctic regions, ice formation and movement in ice surrounding facilities could cause problems for the stability. There may be huge mechanical forces at play when ice moves. Products such as drilling mud used to control and stabilise wells, often contains significant quantities of chemicals or become polluted as a result of use for drilling purposes. There are several elements to consider when regulating offshore drilling in general and in Arctic conditions in particular.

Should a blowout occur in the Arctic, the possibility for mitigating damage could be significantly hampered by factors described in part in section 3.1 above.

It is essential for regulatory authorities with jurisdiction over Arctic offshore to establish effective, legal frameworks for safe drilling operations.

10.2 Description of state of law of respondents

10.2.1 *Canada*

Canada has generally referred to the regulations that apply, but without detailing the material content of their regulations or their specific application.

With respect to which authority is responsible for well design and drilling (question F1), NEB states that NEB itself is

> *"the sole responsible agency for oversight of well design, drilling, and abandonment in the Canadian Arctic offshore."*

That NEB is also responsible for *abandonment* is not specifically relevant to this report.

The question of how well design and drilling are regulated (in the relevant jurisdiction), including how incidents and accidents are followed up (question F2), was answered with a reference to where the rules may be found on the Internet:

- *"Please see COGOA (…[93]) and its associated regulations;*
- *The COGOA (section 5) provides information on required authorizations; and*
- *The Canada Oil and Gas Drilling and Production Regulations provides additional information on well approvals and on well design and drilling."*

COGOA section 5 (1) (b) states that one is required to obtain an

> "*authorization with respect to each work or activity proposed to be carried on."*

[93] *https://laws-lois.justice.gc.ca/eng/acts/O-7/index.html*

The form and content of an application for a permit is determined by CER. Some of the rules appear in the *Canada Oil and Gas Drilling and Production Regulations*[94]. Section 6 of the regulation specifies requirements to the content of an application for, inter alia, drilling permits. Further requirements are stipulated by NER (now CER) for content of a drilling permit application in the Canadian Arctic[95].

Section 4 of the aforementioned regulation contains typical provisions related to drilling, such as installation requirement (section 25), drilling fluid (section 28), well control (section 35), casing and cement specifications (section 39), and wellhead and Christmas tree equipment (section 48), to name a few.

CER has not adopted specific, binding standards for drilling and well design applicable to Arctic conditions:

- *"The COGOA and its regulations are applicable to all the areas under this statute, including onshore and offshore areas, and the Canadian Arctic offshore as well as other offshore areas south of 600 North where COGOA applies;*
- *The statutes do not have any Arctic specific well-design or drilling requirements;"*

However, the federal Canadian authorities have developed non-binding guidelines. In these guidelines, specific indications have been provide suggesting requirements that should be met in order to carry out drilling operations in the *Canadian Arctic offshore:*

- *"Arctic Offshore Drilling Review and companion filing requirements provide non-statutory policy and regulatory expectations for drilling in the Canadian Arctic offshore."*

A comprehensive list of requirements for a drill permit application is included in a brochure available on CER's web pages[96] (note that the link included in the CER response no longer works). This brochure covers all aspects of well design and drilling operations, including environment impact assessment and emergency preparedness.

10.2.2 *United States of America*

BSEE has explained what government body is the regulatory authority responsible for well design and drilling (question F1). This matches the delineation of jurisdictions between the State of Alaska and the federal level. The latter includes the *Federal OSC* (see 5.4.2 above), where BSEE is the competent authority:

> "*BSEE is the regulatory agency responsible for well design and drilling activities in the Federal Arctic OCS. The State of Alaska Department of Natural Resources, Division of Oil and Gas, is the regulatory agency responsible for well design and drilling activities within state waters. (...)*"

General requirements for well design and drilling are explained in BSEE's response, including how minor incidents are followed up (question F2):

> "*The regulations located in 30 CFR part 250 establish the design requirements and practices used in drilling offshore wells within BSEE's jurisdiction. An operator's Application for Permit to Drill (APD), which is submitted to BSEE, describes how the operator will satisfy the requirements in BSEE's regulations. The follow up is provided by BSEE inspections during the*

[94] https://laws-lois.justice.gc.ca/eng/Regulations/SOR-2009-315/page-2.html#h-751154

[95] https://www.cer-rec.gc.ca/bts/ctrg/gnthr/rctcrvwflngrqrmnt/index-eng.html

[96] https://www.cer-rec.gc.ca/bts/ctrg/gnthr/rctcrvwflngrqrmnt/rctcrvwflngrqmnt-eng.pdf

> *drilling operations and investigations of any incidents. The procedures for inspection and investigation are managed by practices and guidelines documented in the Alaska Office of BSEE. For example, during drilling operations operators submit daily well activity reports, completion reports, and incident reports to BSEE*."

The way the Questionnaire was prepared means that some replies necessarily may become repetitive. For example, the United States has developed separate drilling regulations for the Arctic referred to in several parts of this report. For the description *in C1* referred to in the first sentence in the below quote, we refer to section 8.2 above:

> "*The Arctic-specific well design and drilling requirements are described in C1. Also, BSEE regulations allow an operator to submit requests to use alternate procedures or equipment when they can demonstrate that a procedure or piece of equipment will provide equivalent or better safety and environmental protection. This provision creates opportunities for using new technologies and processes. These requests are submitted to BSEE's Alaska OCS Region office, which reviews them on a case-by-case basis. See 30 CFR 250.141 and 250.408."*

SVW has described the procedure to make newer, better standards applicable in section 7.3 above in connection with answers provided to question D4 c).

Finally, BSSE also mentions, in their response to this part of the Questionnaire, that the revision of the *Arctic Drilling Rule* is subjected to review and revision.

11 Specific theme 2: Technical regulation of fire safety under cold conditions

11.1 Facts

There are several challenges and risks associated with fire safety in cold climates. Due to climatic conditions, whole areas, equipment or and facilities will often be completely covered or build-in and thus less accessible for application of extinguishing agents. The use of various extinguishing agents will often be exposed or challenging due to low temperatures. This may for instance cause extinguishing agents, valves etc. to freeze.

11.2 Description of state of law

11.2.1 *Canada*

When asked about identifying the competent authority for fire safety in cold climates, the Canadian answer was identical to their response to other HSE questions: If it falls within the scope of COGOA, then CER is the competent authority. Other Canadian jurisdictions responsible for Arctic areas or for areas with partial Arctic characteristics may also be competent. With this in mind, CER (Question G1) replies that the competent authority is:

> "*(...) the regulator for offshore oil and gas exploration and production work or activity in the Canadian Arctic*."

The rules applicable to fire safety in cold climates are the generally applicable rules provided in COGOA and regulations pursuant to law (question G2). A logic consequence of the response must be that there are no specific rules for cold climate fire safety (question G3), as confirmed by CER. The *Canada Oil and Gas Installations Regulations* contain a number of regulations relating to fire safety in general. The most important rules appear to be (the number refers to the section in the regulations):

> "*23 - Passive Fire and Blast Protection Offshore*
> *24 - Fire Hydrant Systems*
> *25 - Water Deluge and Water Monitor Systems in Areas with Petroleum*
> *26 - General Requirements for Fire Pump Systems and Water Mains*
> *27 - Sprinkler System in Accommodation Areas*
> *28 - Fire-extinguishing Systems in Machinery and Flammable Liquid Storage Spaces*
> *29 - Fire Extinguishers*
> *30 - Firefighting Equipment*
> *31 - Automatic Fire Detection System*s"

As far as SVW has been able to verify, none of the aforementioned provision contain specific measures to counteract the effect of cold climate conditions. One cannot exclude that specific measures are included in some of the standards to which the above provisions refer and that for a large part have been developed by the (Canadian) *National Fire Protection Association.*

CER concludes that no initiative has been taken to develop new rules in this area.

11.2.2 *USA*

BSEE has stated that the United States authorities distinguishes between maritime activities and petroleum operations with regard to contingency. Without further elaboration, there will also exist a similar regulatory separation in most jurisdictions. In this report, it is fire safety related to petroleum operations, which are of interest, and this falls within the responsibility of BSEE (question G1):

> "*Regulation of fire safety under Arctic conditions on the Federal OCS falls to two organizations – the U.S. Coast Guard and BSEE. General maritime fire safety falls under the auspices of the*

> *U.S. Coast Guard, and fire safety of oil and gas operations and production areas would fall to BSEE*."

The response from BSEE is similar to the response received from Canada. Equally, to Canada, there is no specific regulation of fire safety applicable to the Arctic offshore in the United States (question G2):

> "*BSEE's regulations for fire safety, which can be found in 30 CFR 250.859-862, apply to all Federal OCS operations.*"

However, here is a point that BOEM pointed out in its reply that:

> "*BOEM's regulations at 30 CFR 550.220(a) require exploration plans to include a description of the operator's emergency plans for responding to a fire. The requirements at 30 CFR 550.220(a) apply to all exploration activities in the Alaska OCS Region, including those in the Arctic.*"

The provision[97] referred to stipulates specific planning requirements for activities in the Alaska OCS area. The specific provision dealing with fire hazards reads as follows (including the introduction):

> "*If you propose exploration activities in the Alaska OCS Region, the following planning information must accompany your EP:*
>
> *(a) Emergency plans. A description of your emergency plans to respond to a fire, explosion, personnel evacuation, or loss of well control, as well as a loss or disablement of a drilling unit, and loss of or damage to a support vessel, offshore vehicle, or aircraft."*

One may assume that such contingency plans must take into account the particular climatic conditions that apply, but this is not explicitly stated.

In addition to the answer to BOEM quoted above, BSEE states that there is no (question G3):

> "*(...) Arctic-specific fire safety regulations. BSEE's regulations for fire safety, which can be found in 30 CFR 250.859-862, apply to all Federal OCS operations*."

In addition, no specific fire safety rules have been forecasted for the "*Arctic OCS*" (question G4).

[97] https://ecfr.io/Title-30/pt30.2.550#se30.2.550_1220

12 Specific theme 3: Evacuation and emergency preparedness, especially under cold and dark circumstances

12.1 Facts

Distance from rescue and emergency resources without special arrangements and their own contingency plans, is a significant challenge in evacuation and emergency situations in the Arctic. Rescue equipment intended used would have to be adapted to sea ice or icebergs. Low temperature is an enemy in any emergency and rapidly results in fatalities without presence of mitigating measures. Poor visibility due to snow, icing, whipping or darkness also limits the use of available rescue resources.

Regulating evacuation and emergency response in cold climates and the dark requires proper planning, execution and verification of systems in order to avoid loss of life.

12.2 Description of state of law

12.2.1 *Canada*

In summary, the answers provided by Canada are similar to the replies concerning fire safety in the previous chapter. The competent authority is NEB (question H1), with the reservations as previously stated for other relevant jurisdictions.

There are no Arctic specific rules in Canada regarding emergency preparedness for evacuation or emergencies (question H3).

The general legislation applicable, such as the COGOA and regulations pursuant to it, applies (question H2).

NEB further states that there are no plans to initiate the development of new rules specific to the Arctic.

12.2.2 *United States of America*

In the Questionnaire, the recipients were asked to identify the regulatory authority for evacuation and emergency preparedness. BSEE replied (question H1):

> "*Maritime safety and vessels, including emergency preparedness (except for oil spill preparedness) and evacuation, are the responsibility of the USCG. BSEE is responsible for offshore energy operations, which includes production operations and areas, in the Federal OCS. Operations in state waters fall under the regulatory authority of the USCG and the State of Alaska, though BSEE still has responsibility for oil spill preparedness planning for operations in state waters.*"

BSEE also answered in the same manner on the next question (H2). The purpose of the question was to identify the oil companies' duties as regulatory subjects. In any case, BSEE's reply was:

> "*The U.S. Coast Guard is responsible for evacuation and emergency preparedness described in H2(a-d) (except for oil spill preparedness, which is BSEE's responsibility) for energy operations on the U.S. OCS. BSEE regulations for source control, well control, and drilling apply to all Federal OCS areas. (...).*"

BOEM gave a slightly different answer. In their reply the duty of the operator to prepare evacuation plans, etc. is pointed out, and implicitly a requirement to take into account Arctic conditions is indicated:

> "*BOEM's regulations at 30 CFR 550.220(a) require exploration plans to include a description of the operator's emergency plans for personnel evacuation, loss or disablement of a drilling*

unit, and loss of or damage to a support vessel, offshore vehicle, or aircraft. The requirements at 30 CFR 550.220(a) apply to all exploration activities in the Alaska OCS Region including those in the Arctic."

It is interesting that the United States has introduced such rules, while Canada has not. However, this may be due to the difference in legal and administrative approach. As previously pointed out, Canada increasingly applies a functional approach to requirements in what they call a *hybrid* solution. While the United States remains largely de facto descriptive through the comprehensive incorporation of standards.

BSEE further explains the operator's duties in relation to emergency preparedness and requirement to adapt to Arctic conditions (question H3) in the following manner:

"The Arctic Drilling Rule has Arctic-specific requirements for operators related to source/well control.

- *Conducting operations in a manner suitable for Arctic OCS conditions*
- *Access to, and ability to deploy promptly, source control and containment equipment to respond to a loss of well control*
- *Access to a separate relief rig and the ability to drill a relief well within the same drilling season*
- *Capability to predict and respond to ice conditions and adverse weather*
- *Effective contractor oversight*
- *Submission of oil spill responses plans (OSRP's) specific for Arctic conditions (...)"*[98]

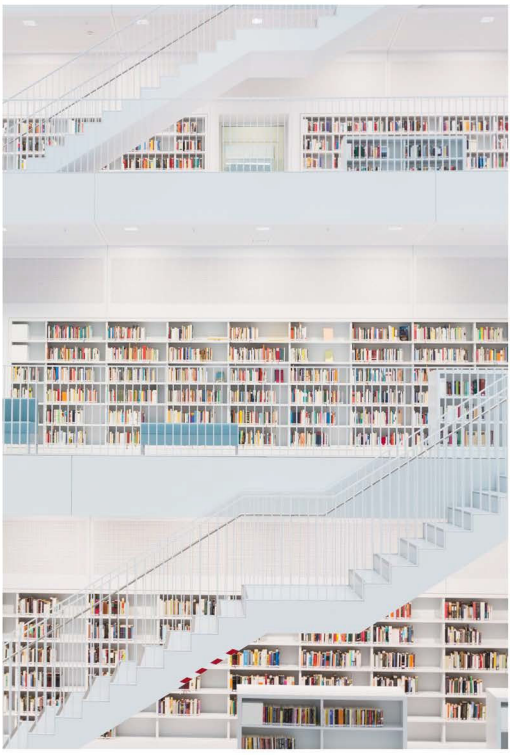
It also emerges that BSEE has the option and actually makes use of its authority to stipulate conditions:

"*BSEE included additional requirements (not from industry standards) in Shell's 2012 and 2015 drilling permits related to wildlife, subsistence issues, and ice operations."*

On the last question (H4), BSEE states that no new rules are planned, other than updating the aforementioned Arctic drilling regulations.

[98] The bullet point "*Developing and submitting an Integrated Operations Plan (IONP) to BOEM*" was deleted following a request by BOEM.

13 - Appendix 1



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The Arctic 2019-project

- The Norwegian Petroleum Safety Authority (PSA) has initiated a project with the aim to complete a mapping program and an information comparative study program.
- The work title of the program is The use of standards to promote safe offshore Arctic Petroleum Activities ("the Arctic 2019-project")"

The Questionnaire

- The recipients of the Questionnaire have previously confirmed to PSA their commitment to contribute information to the Arctic 2019-project, cf. PSA's invitation 8 April 2019.
- The purpose of the Questionnaire is to facilitate participants' contribution of information to the Arctic 2019-project.

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Purpose and Scope

- **The overall purpose** of the Arctic 2019-project is to increase knowledge of the different jurisdictions' administrative organization and regulatory framework regarding the promotion of safe offshore petroleum activities in the Arctic.
- By **Arctic Petroleum Activities** is in this questionnaire understood planning, preparations and conduct of operations associated with infrastructure located in the Arctic.
- **The "Arctic" region** as a geographical term will have different meaning in the various jurisdictions. For the purpose of this project, it was not considered necessary to precisely define the term.
- The purpose is to **focus on common risks unique to offshore petroleum activities in the Arctic**. Such risks may include climate conditions, logistic challenges resulting from distances, ice, darkness, difficulties associated with communication, transport requirements and a particularly vulnerable environment.

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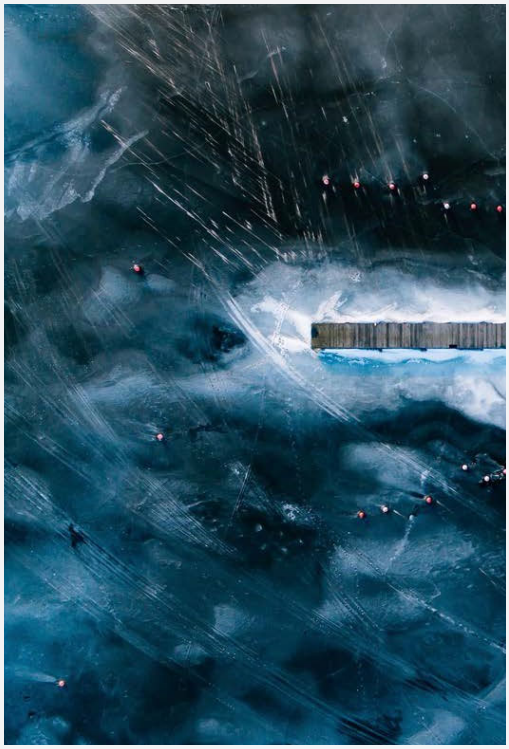
Focus on Safety

- The **Arctic is not comparable** to other geographical areas. It may have **serious consequences** to personnel, infrastructure and - eventually - the environment, if something goes wrong during offshore petroleum activities.
- **Common risks** to offshore petroleum activities may in the Arctic geographical area impose **additional unique challenges.** Special focus on protection of human life and the working environment is therefore required.
- Rules and regulations for the promotion of safe offshore petroleum activities are often classified under umbrella-terms such as "HES"/"HSE" or similar. Such terminology will normally cover topics such as **safety, working environment and emergency preparedness** – which is at the focal point of the Arctic 2019-project.
- Traditional use of terms such as "HES"/HSE" will commonly also include the natural environment. Safe offshore petroleum activities in the Arctic region is a prerequisite for the protection of the vulnerable Arctic natural environment. However, the impact on or consequences for **the natural environment fall outside the scope of this Questionnaire and the Arctic 2019-project**. This Questionnaire aims at addressing those safety elements related to or affecting humans in a working environment.



Approach

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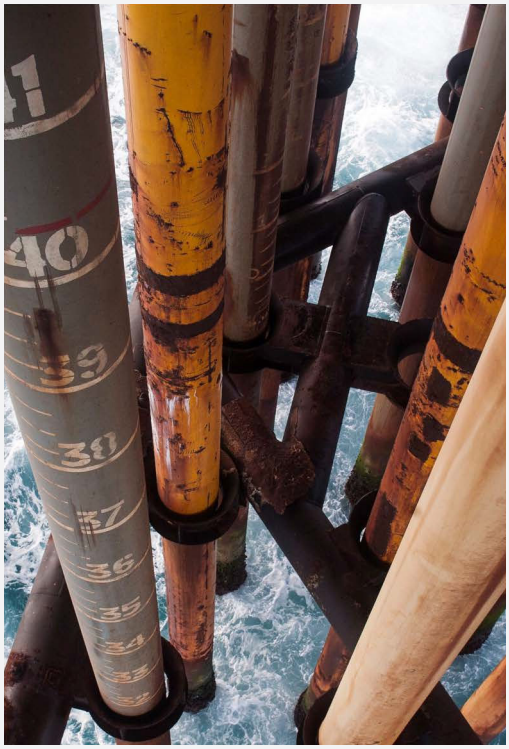
Comparative legal analysis

- The Arctic 2019-project is a **legal method based** mapping- and comparative study.
- A central aim of the project is to collect, analyze and compare the **general aspects** of the regulatory approach and technique applied in each jurisdiction participating in the survey, and to map the **interaction between national laws and the various standards** relevant for Arctic petroleum activities.
- The aim of the project is also to identify any **Arctic offshore petroleum activities dedicated requirements in addition to or deviating** from otherwise generally applicable rules and standards.

Specific topics

- The Arctic 2019-project will also comprise of an in-debt analyses on **specific topics**:
  1. Well-design and drilling, whether for exploration, appraisal, production or injection purposes;
  2. Technical regulation of fire safety under cold conditions; and
  3. Evacuation and emergency preparedness, especially under cold and dark circumstances.
- The purpose including specific topics is to illustrate, from a **practical perspective**, how the aim of ensuring safe activities are regulated across the jurisdictions, including how standards are applied for such purposes.



Purpose

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The primary purpose of the Questionnaire is to provide a source of quality assured information, which subsequently will form the basis of the project report.

- Prior to the Arctic 2019-project, an initial desk-top based mapping exercise has been undertaken. This initial mapping compile substantial, but incomplete information on existing institutions, regulations and use of standards relevant to safe petroleum activities in the Arctic.
- Initial mapping confirmed a lot of information on available legal sources, regulations, institutions, etc. However, different legal traditions and constitutional systems affect the design of administrative organizations, the content of law and regulations and the enforcement structure in each jurisdiction. This makes quality assured information and comparative analyses challenging.
- On that background, one of the main recommendations from the initial mapping exercise was to secure early involvement of personnel from the relevant authorities of each jurisdiction in the Arctic 2019-project.

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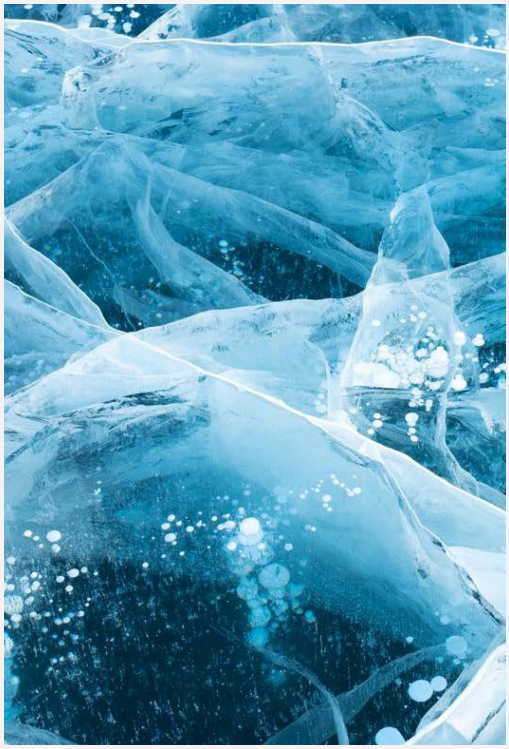

Content

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The Questionnaire seeks to balance the need for quality assured information in respect of generally applicable and Arctic-specific regulations, and the interaction between national law and standards.

- Initial mapping confirmed that an analysis of the general relationship between law and standards requires in-depth **knowledge of national law and the function of institutions** in each jurisdiction.
- Initial mapping also confirmed that most of the relevant standards applicable to the petroleum sector do **not appear to specifically target risks particular to the Arctic**.
- The questions set out below will hopefully assist in closing some of the *"knowledge gaps"* discovered during initial mapping. The **aim is to enable a robust comparative analysis** on how the use of standards interact and assist in promoting safe offshore petroleum activities in the Arctic region.

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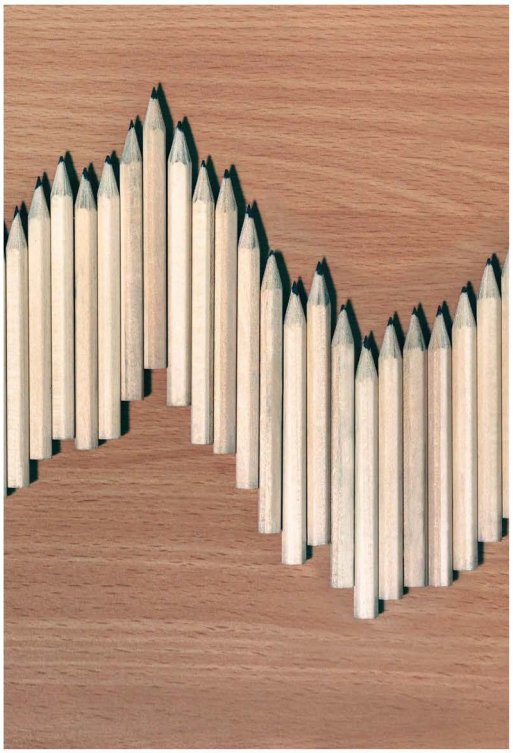

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Please respond within

1 August 2019

to

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A The general structure of petroleum administration

Ref.	Questions
A1	Please identify the key petroleum activities regulatory bodies (institutions or organization; central-, regional- or local governmental, and private, if applicable) in your jurisdiction. Describe briefly their areas of responsibility, scope of authority and powers in relation to petroleumactivities.
Explanatory note to A1	The rationale behind this question is to get a better understanding on how the foundations of the administrative organizations within the different legal traditions and constitutional systems may affect the use of standards in each jurisdiction. This question is general in nature, i.e. non-specific to Arctic petroleum regulation. The purpose of this question is to identify all the relevant administrative bodies (such as, but not limited to, ministries, bureaus, directorates or any other kind of administrative agencies) with responsibilities relating to petroleum regulation and regulatory enforcement (criminal prosecution excluded). This includes state institutions, as well as any regional and local authorities. Any international institutions (multilateral or bilateral) falls outside of the scope of this Questionnaire and the Arctic 2019-project.
A2	What regulatory bodies are responsible for the regulation of safety, including working environment and emergency preparedness, in respect of Arctic offshore petroleum activities in your jurisdiction.
A3	What regulatory bodies are responsible for the supervision and enforcement of safety, including working environment and emergency preparedness, in respect of Arctic offshore petroleum activities in your jurisdiction?
Explanatory note to A2 and A3	Same as AE1 above. However, AQ2 and AQ3 are Arctic-specific.

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B The general structure and content of petroleum regulation

Ref.	Questions
B1	Please identify and briefly describe the key points of the principal petroleum law(s) and (secondary) regulations. Of particular interest would be law establishing the foundation for the more detailed regulatory regime, including the application of standards. When available, please provide references to public domain sources (that may be freely accessed).
B2	Please identify how any individual administrative decisions or authorizations (if any) such as decrees, licenses, permits etc. interact with the principal petroleum law(s) and regulations? If no such instruments exist, please give a brief explanation why not or if this is not applicable in yourjurisdiction.
Explanatory note to B1 and B2	Question B1 and B2 are general, i.e. non-specific to Arctic petroleum regulation. The purpose of these questions are to enable us to understand the regulatory hierarchic structure - context - of petroleum regulation in each jurisdiction. The answers to these questions is intended to allow a better understanding on how the regulatory structures - laws, regulations and administrative decisions - within the different legal traditions and constitutionalsystems may affect the use of standards.
B3	How are the relevant petroleum safety requirements normally formulated or described in the relevant regulations or individual administrative decisions or authorizations? Would it be possible to characterize the safety level requirements (at least) as: a) performance based (functional) requirements, which specify safety level to be achieved but not how to achieve it, or as b) prescriptive requirements regarding safety level and how to achieve the level; or c) are there other regulatory approaches or strategies behind the formulation/descriptions of safety level requirements?
Explanatory note to B3	The purpose of this question is to establish an understanding on how various regulatory strategies or approaches may influence on the interaction and use of standards as tools for describing relevant safetyrequirements.
B4	Please provide us with copies of the relevant law(s), regulations as identified above, including any available authorizations or administrative decisions that may be of interest to the Arctic 2019-project. Please indicate to what extent this is public domain or needs to be protected as confidentialinformation.
Explanatory note to B3	The purpose is to identify and collect as many legal sources as possible and to include these as enclosures to the project report, with the purpose of increasing circumpolar administrations' and stakeholders' knowledge of the different jurisdictions' administrative organization and regulatory framework regarding the promotion of safe offshore petroleum in the Arcticregion.

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C Arctic-specific petroleum regulation

Ref.	Questions
C1	Please identify and briefly describe the key points of the relevant petroleum law(s) and regulations for safety, including working environment and emergency preparedness, in respect of Arctic offshore petroleum activities.
Explanatory note to C1	By using the term *"Arctic-specific petroleum regulation"*, we mean any dedicated Arctic offshore petroleum activities requirements in addition to or deviating from otherwise generally applicable rules and standards applied across the jurisdiction. The focal point of the Arctic 2019-project are topics such as safety, working environment and emergency preparedness. Many jurisdictions use terms such as "HES"/HSE", which normally will include the natural environment. However, the impact on or consequences for the natural environment fall outside the scope of this Questionnaire and the Arctic 2019-project – where the Safety- dimension as such will be highlighted. The Questionnaire aims at addressing those safety elements that are related to or affecting humans in a working environment.
C2	Please identify any planned initiatives or legislation specifically relevant for Arctic offshore petroleum activities. Is it possible to estimate when such legislation may come into effect.
C3	Please describe if there are any other relevant instruments of law, in addition to the traditional laws and regulations, that may have any practical impact in respect of regulating petroleum activities in the Arctic.
Explanatory note to C3	The *"Arctic region"* consists of jurisdictions with different legal traditions and structure. Relevant "instruments of law" in addition to laws and regulations may complement the legal picture in respect of Arctic petroleum activities. Such "instruments" of practical importance may be of binding or non- binding nature. Examples may be individual administrative orders, recommendations, guidelines, regulatory interpretations, letters, notices, procedures etc. issued by governmental/administrative bodies – state, regional og local. We are not asking for standards in this particular Question.
C4	Please provide, if possible, copies of the relevant law(s), regulations as identified above, that may be of interest to the Arctic 2019-project.
Explanatory note to C4	The purpose is to identify and collect as many legal sources as possible and to include these as enclosures to the project report, with the aim of increasing circumpolar administrations' and stakeholders' knowledge of the different jurisdictions' administrative organization and regulatory framework regarding the promotion of safe offshore petroleum in the Arctic region.

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D Regulatory strategy and approach with regard to the use of standards

Ref.	Questions
D1	Please describe briefly the national standardization systems in your jurisdiction, in particular with regard to the promotion of safe petroleum activities. Please include a description of the different regulatory bodies (institutions or organization; central-, regional- or local governmental, and private, if applicable) that contribute to this work, and their respective roles. This include governmental institutions whether central, regional or local, and private organizations, if applicable.
D2	Please briefly describe the work processes and institutional responsibilities for identification of needs, development, completion and maintenance of standards promoting safe petroleum activities.
D3	What regulatory bodies for assessing whether a particular standard is appropriate for use in achieving a sufficient level of safety?
Explanatory note to D1- D3	The purpose of the above questions is to establish an understanding of strategies or policies with regard to the promotion and use of standards in the various regulatory systems
D4	Please describe the regulatory approach or technique used in order to secure an interaction between petroleum safety regulation and the use of standards, (at least) with regard to whether the relevant standards are incorporated: a) directly into existing regulations; b) into existing regulations by reference; c) into other instruments such as administrative orders (authorizations, permits, licenses, approvals or consents, etc.); or d) any other ways of approach – such as recommendations to use certain standards in guidelines?
D5	Are standards considered mandatory or non-mandatory rules non-binding recommendations or similar type of guidance?
Explanatory note to D4 and D5	The purpose of question D4 and D5 is to establish a better understanding of the different regulatory approaches and techniques (legal processes) used to incorporate relevant standards into the national regulatory framework, either as mandatory rules or non-mandatory "recommendations" or similar.

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E Safety Standards applicable to Arctic Petroleum Activities

Ref.	Questions
E1	Please identify any Arctic-specific standards relevant for petroleum activities in your jurisdiction.
E2	Please identify generally applicable standards relevant to safety that will apply also to Arctic offshore petroleum activities.
Explanatory note to E1 and E2	By *"Arctic Petroleum Activities"* is understood planning, preparations and conduct of operations associated with infrastructure located in the Arctic. By *"Arctic-specific standards"* is meant any Arctic dedicated offshore petroleum activities requirements, in addition to or deviating from otherwise generally applicable standards applied across the jurisdiction.
E3	Please describe briefly the scope and purpose of such Arctic-specific standards. In particular, please advise whether any of the Arctic-specific standards aim at regulating safety elements related to or affecting the working environment (cf. the focal point of the Arctic 2019-project and this Questionnaire).
E4	If available, please provide references to public domain sources (preferably websites) identifying and preferably containing the publication of the above mentioned standards, and if not included how to potentially acquire such publications.
E5	Please advise if there are any planned initiatives regarding the development of Arctic-specific standards relevant to safe petroleum activities? Is it possible to indicate when such standards may be agreed to, or may be incorporated into relevant petroleum legislation?

simonsen vogtwiig

F Well-design and drilling (whether for exploration, appraisal, production or injection purposes)

The purpose of the questions on this page is to receive information relevant to analyze specific topic No. 1 (see page 7) of the Questionnaire

Ref.	Questions
F1	Please identify the key regulatory bodies (institutions or organization; central-, regional- or local governmental, and private, if applicable) in your jurisdiction with responsibilities for well-design and drilling activities in the Arctic region. If more than one regulatory body, please describe briefly their respective areas of responsibility.
F2	Please describe how well-design and drilling, including how the follow-up of hazards, incidents and accidents related to drilling operations, are regulated in your jurisdiction.
Explanatory note to F2	We are looking to identify the scope and key points of the principal petroleum law(s) and regulations dealing with well-design and drilling, including the use of authorizations or individual administrative decisions such as licenses, permits etc., and any other instruments of law – including the application of any standards.
F3	Please describe any dedicated Arctic-specific well-design and drilling requirements, in addition to or deviating from generally applicable rules and standards applied across the jurisdiction.
F4	Please identify any planned initiatives regarding the development of Arctic-specific standards or regulations of relevance to this matter.

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G Technical regulation of fire safety under cold conditions

The purpose of the questions on this page is to receive information relevant to analyze specific topic No. 2 (see page 7) of the Questionnaire

Ref.	Questions
G1	Please identify the key regulatory bodies (institutions or organization; central-, regional- or local governmental, and private, if applicable) in your jurisdiction with responsibilities for technical regulation of fire safety under cold – Arctic – conditions. If more than one regulatory body, please describe briefly their respective areas of responsibility.
G2	Please describe the technical regulation of fire safety under cold - Arctic - conditions in your jurisdiction.
Explanatory note to G2	We are looking to identify the scope and key points of the principal petroleum law(s) and secondary regulations dealing with fire safety under cold conditions, including the use of individual administrative decisions such as licenses, permits etc., and any other sources of law – including the use of standards. We are looking to identify standards and requirements relevant to fire safety for the facility including process, drilling, utility and living areas. The question is intendent to be limited to aspects of fire safety. We are particularly interested in active and passive systems intended to stop the fire spreading. Such requirements may relate to fire-walls and protection of structural members, and fire extinguishing systems (i.e. water, powder and gas (CO_2)). We are not seeking to identify standards or requirements related to detection of fire or automated safety systems used to shutdown or isolate a facility or production area.
G3	Please describe any dedicated Arctic-specific fire safety requirements, in addition to or deviating from generally applicable rules and standards.
G4	Please identify any planned initiatives regarding the development of Arctic-specific standards or regulations of relevance to this matter.

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H Evacuation and emergency preparedness, especially under cold and dark circumstances

The purpose of the questions on this page is to receive information relevant to analyze specific topic No. 3 (see page 7) of the Questionnaire

Ref.	Questions
H1	Please identify the key regulatory bodies (institutions or organization; central-, regional- or local governmental, and private, if applicable) in your jurisdiction with responsibilities for evacuation and emergency preparedness regulation. If more than one regulatory body, please describe briefly their respective areas of responsibility.
H2	Please describe the regulation of evacuation and emergency preparedness under cold and dark circumstances, i.e. under Arctic conditions, in particular with regard to: a) evacuation from a facility – (may include the use of lifeboats, helicopters, escape chutes, rafts or similar); b) survival of personnel until rescue is possible; c) rescue of personnel and transport to a safe location; and d) medical emergency preparedness, including initial lifesaving measures and transport to a medical facility (hospital)
Explanatory note to H2	We are looking to identify the scope and key points of the principal petroleum law(s) and secondary regulations dealing with evacuation and emergency preparedness as defined above, including the use of individual administrative decisions such as licenses, permits etc., and any other sources of law – including the use of standards. The scope of this Questionnaire and the 2019-project focuses on those safety elements that is related to humans in a working environment, the prevention of incidents that may lead to or result in emissions or spills, cf. in more detail the above *"Focus on Safety"*. Please note that, at this stage, oil spill preparedness is not intended included, although safe offshore petroleum activities in the Arctic is a prerequisite for the protection of the vulnerable Arctic environment.
H3	Please describe any dedicated Arctic-specific evacuation and emergency preparedness requirements, in addition to or deviating from generally applicable rules and standards.
H4	Please identify any planned initiatives regarding the development of Arctic-specific standards or regulations of relevance to this matter.

Please do not hesitate to contact us if you have any questions to this Questionnaire

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