CG1 COMMENTS: ***Canada–Newfoundland and Labrador Offshore Area Petroleum Operations Framework Regulations, Canada-Nova Scotia Offshore Area Petroleum Operations Framework Regulations***

Reviewer/Comments From: WWF-Canada (comments apply to both the Newfoundland-Labrador and the Nova Scotia Framework Regulations)

THE TABLE BELOW REPRESENTS A HIGH-LEVEL OVERVIEW OF WWF'S MAIN COMMENTS. PLEASE SEE WWF'S FULL SUBMISSION FOR CONTEXT, BACKGROUND AND SUPPORTING REFERENCES, WHICH PROVIDE FURTHER EXPLANATION OF AND RATIONALE FOR THE POINTS MADE IN THE TABLE BELOW.

Introduction

Offshore oil and gas activities represent a genuine threat to the marine environment and the stability of the global climate system. Even if nothing goes wrong, there are unavoidable impacts from each phase of oil development - seismic exploration, drilling waste (fluids and cuttings), pipelines, offshore and onshore terminals, tanker traffic, and so on. If a major spill or a well blowout were to occur in the Atlantic offshore, it would seriously imperil the surrounding marine environment, potentially destroying habitat for whales, fish, sea birds, and many other animals. The consequences for local communities, some of whom depend on healthy and clean waters for their livelihoods could be devastating. Moreover, the very purpose of oil production is to extract and burn more oil, which increases greenhouse gas (GHG) emissions and exacerbates the global climate crisis at a time when we need to be rapidly reducing GHG emissions.

Some of the conditions that can increase the risk of an accident or well blowout are present in the North Atlantic region, including deep water, extreme weather and the need for exploration and development drilling. For instance, the 2018 Husky Sea Rose FPSO accident off the coast of Newfoundland and Labrador, the largest spill in the province's history, was the result of a severe storm (not uncommon) and poor judgment by the operator to resume operations by attempting to reconnect a flowline in high sea state conditions – storm conditions deemed unsafe to deploy on-water response to the spill. In its review of the Deepwater Horizon disaster, a national commission noted that "deep water drilling brings new risks, not yet completely addressed by the reviews of where it is safe to drill, what could go wrong, and how to respond if something does go awry."[1] The elevated risk of operating in this extreme environment makes it incumbent upon the government to ensure the world's highest standard of regulations are in place to govern oil and gas off the coast of Newfoundland and Labrador.

The new Framework Regulations make some welcome and necessary regulatory updates; however, the regulations will not be sufficient to ensure that the highest possible science-based safety and environmental standards are met, including robust and effective well control and emergency response measures. In addition, the new regulations will not ensure that oil and gas development avoids ecologically-sensitive marine areas and is consistent with global and domestic climate goals, and Indigenous rights and agreements.

WWF-Canada believes there are a number of serious shortcomings in the proposed Framework Regulations including:

- Insufficient measures to compel adequate and timely oil spill response capacity. No legal regulations to ensure that sufficient people and equipment could respond to a spill from a drilling rig or a ship, nor any obligations to ensure that such a response would occur within a legally required time frame.
- Regulations do not require the use of the Best Available and Safest Technologies (BAST), or that a capping device or relief drilling rig be on site during drilling operations in the event of a loss of well control.

[1] https://www.govinfo.gov/content/pkg/GPO-OILCOMMISSION/pdf/GPO-OILCOMMISSION.pdf#page=14

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- Regulations do not prevent drilling in ecologically sensitive marine ecosystems, culturally important or high-risk areas.
- No requirement to reduce accident risk to a level that is as low as (reasonably) *possible* (i.e., as opposed to 'as low as reasonably *practicable*').
- No requirement to include local stakeholders, Indigenous groups or members of the broader Canadian public in determining tolerable levels of risk.
- Insufficient liability and financial responsibility rules to ensure that companies (and not taxpayers) are fully liable for clean-up and compensation costs and have the capacity to pay.
- Inadequate separation of the regulator's primary responsibility to ensure economic benefits from oil and gas development from its responsibility to enforce safety and environmental regulations and conduct impact assessments.
- No requirement to have any scientific expertise, such as marine biologists or climate scientists, or Indigenous representation on the Board of Directors of the Atlantic Offshore Petroleum Boards.
- No science-based rules for seismic blasting activity including minimum safe distance requirements specific to the North Atlantic marine environment.
- No requirement to ensure decisions about whether and under what conditions offshore oil and gas activities are consistent with Canadian carbon reduction commitments and with Indigenous rights and agreements.

This submission therefore proposes the following series of proven measures, specific to the North Atlantic, which should be required in the Framework Regulations before any offshore oil and gas activities go ahead:

1. **Region-specific regulations:** Require operators to comply with a best available and safest technologies (BAST) mandate, as found in the U.S., which is region-specific and verified by a qualified third party.

2. **Risk assessment:** Require project risk to be reduced to a level that is as low as reasonably *possible* (not *practicable*) and determined through an inclusive, collaborative process involving the regulator, the operator, relevant stakeholders, and independent third-party experts.

3. **Atlantic Offshore Petroleum Boards:** Separate the Boards' responsibility to facilitate and approve drilling projects from its safety and environmental protection mandate.

4. **Liability:** Make operator liability for oil spills unlimited regardless of fault.

5. **Climate change:** Ensure all new oil and gas production and consumption is consistent with national and global climate goals.

6. **Ecologically and culturally sensitive areas:** Respect Indigenous rights and agreements, and prohibit petroleum activities in or near high risk, culturally important and ecologically sensitive areas.

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7. **Seismic testing:** Strengthen evidence-based rules for seismic programs and require alternatives that are less harmful to marine wildlife.

8. **Oil spill response:** Regulations must ensure effective and efficient oil response capacity.

WWF-Canada would like to note that the Framework Regulations include the following statement: "*The World Wildlife Fund commended the government partners' efforts in modernizing the regulatory framework and seeking the advice of stakeholders throughout this process, noting its view that the modernization of the offshore regulatory regime in Canada was long overdue. WWF identified a few areas of concern, including the role of the regulators in interpreting and applying more outcome-based regulations in the absence of prescribed standards, and the inherent principle that operators must ensure that risk is reduced to as low as reasonably practicable*."

This statement is misleading and we ask that it be removed or amended as it seems to indicate that we support the government's proposed approach to regulatory reform. We do not. While we feel that the modernization of offshore regulations is indeed long overdue, we have more than "a few areas of concern." **The proposed Framework Regulations are flawed and will not be sufficient to ensure that petroleum operations can be carried out safely with the lowest possible risk to the marine environment.**

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Comment #	Part / Title	Section Title	Section/ subsection	Regulation Provision Text (published in *Canada Gazette*, Part I)	Comment / Problem Created	Proposed solution/changes
1. Region-specific BAST requirement and well control	**Part 6** **Drilling and Production** **Evaluation of Wells, Pools and Fields** **PART 2 Authorization** **PART 4 General Requirements for Authorized Works and Activities**	Well integrity and Well control Design Measures Uncontrolled Well Safety and protection of environment	Part 6: 68(1) 103(6) Part 2: 12(3) Uncontrolled Well Part 2: 11(1) Part 4: 39(e)	Part 6 *68(1) An operator must ensure that adequate procedures, materials and equipment are in place and used throughout the life cycle of the well to prevent the loss of well control.* Part 2 12(3) the contingency plan must also include a description of the source control and containment measures to stop the flow from an uncontrolled well and to minimize the duration of a spill and its environmental effects, 12(3)(c) the schedule and plan for the mobilization, deployment and operation of source control and containment equipment, including measures to minimize deployment time that take required regulatory approvals into consideration Part 2 11 (1) An operator must develop	In the event of a loss of well control, the Regulations do not require an operator to stop an oil spill by capping a blowout or having a relief drilling rig on site within a prescribed period (as is the case in other countries). There are also no requirements anywhere in the Regulations for the operator to use the best available and safest technologies appropriate to the drilling region. The Framework Regulations require only "adequate" procedures and equipment, and that the operator provide simply a "description of the source control and containment measures to stop the flow from an uncontrolled well and to minimize the duration of a spill and its environmental effects." Moreover, an operator must develop "an environmental protection plan…necessary to protect the environment from the proposed work or activity, including target levels of safety and hazard management". But again, no standard of technology is mandated. This is not good enough.	**Add the following text to the Regulations in the preamble and throughout the document at relevant sections:** ***"The use of the best available and safest technologies, which are designed specifically for the drilling conditions, is required throughout the life cycle of the well to prevent loss of well control*, except where the Minister determines that the incremental benefits are clearly insufficient to justify the incremental costs of utilizing such technologies."** **Part 2** **12(3) "The contingency plan must describe the best available and safest technologies (verified by a competent and independent third party) to be used for source control and containment measures to stop the flow from an uncontrolled well and to minimize the duration of a spill and its environmental effects. In the event of a loss of well control,**

				an environmental protection plan that sets out the procedures, practices, resources and monitoring measures that are necessary to protect the environment from the proposed work or activity, including target levels of safety and hazard management. Part 4 (39) An operator must take all measures necessary to ensure safety and the protection of the environment during any authorized work or activity, including: **(e)** any equipment that is necessary for safety and the protection of the environment is available and in a condition to perform as expected at all times; Part 6 Well control 68 (1) An operator must ensure that adequate procedures, materials and equipment are in place and used throughout the life	The regulations must require operators to have immediate access to surface and subsea containment resources (i.e., a capping stack and containment dome) that would be adequate to promptly respond to a blowout or other loss of well control where a capping stack must be onsite **within 24 hours** (as in Alaska). The Well Control regulations rely too heavily on performance standards and should instead *mandate* the use of the 'Best Available and Safest Technologies' (i.e., a BAST requirement) for well control, containment systems, and other procedures that are designed specifically for the extreme conditions found in this region. BAST utilizes a performance-based approach to technology solutions but establishes a minimum standard that relies on consistent and verifiable testing and evaluation of a given technology's operational history, identifies candidate technologies (suggested by industry) for BAST determinations, then evaluates these technologies using consistent and verifiable testing protocols by a verified third party. BAST does not restrict operators to the implementation of specific technologies but would require the application of practices that have	**surface and subsea containment resources (e.g. capping stack and/or containment dome) must be on site within 24 hours."** **12(3)(c) "the plan for the mobilization of source control and containment equipment for arrival on site within 24 hours and the plan for deployment and operation, including measures to minimize deployment time that take required regulatory approvals into consideration"** **Part 2** **11 (1) "An operator must develop an environmental protection plan that utilizes the best available and safest technologies and sets out the procedures, practices, resources and monitoring measures that are necessary to protect the environment from the proposed work or activity, including target levels of safety and hazard management."** **Part 4** **39(e) "An operator must take all measures necessary to ensure safety and the**

				cycle of the well to prevent the loss of well control.	been shown to be successful and relevant to those projects that have risk characteristics similar to past operations.	**protection of the environment during any authorized work or activity, including:** **(e) the best available and safest technologies are used and is available for any equipment that is necessary for safety and the protection of the environment and is in a condition to perform as expected at all times;"** **Add to part 6, 68(1):** • **Drilling rigs must have redundant BOP systems installed to ensure the equipment functions in an emergency. Subarctic platforms that are used off the Atlantic coast need to be much stronger than temperate-water platforms.** • **BOP standards should be suitable for operation in sub-freezing conditions, include third-party verification and periodic recertification, and redundant (double) blind shear rams.**
2. Risk Assessment and Analysis	PART 8 Installations,	Installations Well Approvals	Part 8 Preamble and 106(1) Part 3: 3(c)	Part 8 Preamble: The proposed Regulations would establish a more robust framework for the design of installations, which	The risk assessment process throughout the Framework Regulations is far too subjective. The operator should not be responsible for or relied upon to carry out their	**Throughout the Framework Regulations text, replace "as low as reasonably practicable" risk reduction with "as low as**

	Wells, Pipelines and Vessels PART 3 Certificate of Fitness PART 2 Authorization	Content of Concept Safety Analysis	Part 2: 2(f) 11(1)	would be rooted in comprehensive technical analysis and risk assessment, with the ongoing obligation of the operator to ensure that risk is reduced to as low as reasonably practicable. Part 8 106 (1) An operator must ensure that an assessment of fire and explosion risks and of risks associated with hazardous gas and its containment is conducted for any installation Part 2 2(f) identify all assumptions and control measures that are to be implemented to reduce the risks associated with the identified hazards to a level that is as low as reasonably practicable Part 2: **Environmental protection plan** 11(1) An operator must develop an environmental protection plan that sets out the procedures, practices,	own risk assessment analysis (part 8 106(1)). Who will determine whether project and installation risk has been reduced to a level that is "as low as reasonably practicable" and by what criteria will this assessment be made? Who determines what should be the "target levels of safety"? The Framework Regulations must include a requirement that operating risks be reduced to a level that is 'as low as possible' (or ALAP). This would help circumvent the need for a subjective assessment of acceptable risk reduction inherent to the ALARP standard and would eliminate economic cost as a rationale for not reducing a safety risk. Only the Minister should have the authority to determine whether the incremental benefits are "clearly insufficient" to justify the incremental costs of achieving the ALAP standard.	**possible" (or "as low as (reasonably) possible").** **For example, part 2, section 2(f) "identify all assumptions and control measures that are to be implemented to reduce the risks associated with the identified hazards to a level that is as low as possible, *except where the Minister determines that the incremental benefits are clearly insufficient to justify the incremental costs of further risk reduction*."** **Delete 106(1) in part 8 and add the following text to Part 8 Section 101 (Design Analysis and Risk Assessment):** **"The determination of acceptable risk for a proposed project will flow from a social process that requires several layers of corroborations and validations with the input of the following stakeholders:[2]** **1) the affected public and local communities including Indigenous organizations;**

				resources and monitoring measures that are necessary to protect the environment from the proposed work or activity, including target levels of safety and hazard management. 11(2)(b)(i)(B) assess environmental risks associated with the identified hazards, Part 3: 3(e) any measures that the operator intends to implement to reduce safety and environmental risks to a level that is as low as reasonably practicable in respect of the design of the installation, including its systems and equipment		**2) governments of those affected (local, provincial/territorial, federal);** **3) commercial/industrial groups;** **4) civil society including independent experts in analyzing offshore drilling risk.**
3. Regulator Responsibility	PART 6 Drilling and Production	Completion, testing and operation	71(1)(a) 79(a)	71(1)(a) The operator of a well must ensure that the well is completed, tested and operated in a safe manner that allows for maximum recovery of petroleum without waste or	The Atlantic Offshore Petroleum Boards are responsible both for enabling oil recovery and value to create jobs, as well as overseeing safety and environmental issues. The Framework Regulations explicitly mandate operators to ensure the "maximum recovery of petroleum."	**The Boards' responsibility to "maximize recovery of petroleum" and ensure economic benefits from the oil and gas industry must be completely separate from its role in ensuring safety and environmental protection.**

				pollution throughout the life cycle of the well; 79(a) recovery from a pool or zone is maximized in accordance with good oilfield practices;	This is consistent with the Boards' role under the Accord Acts in ensuring economic benefits from oil and gas while also regulating the industry to ensure safety and environmental protection. There are no requirements to include local stakeholder representatives on project review panels or for the Boards to have any scientific expertise, such as marine biologists or climate scientists, or Indigenous representation on their Board of Directors. Investigations into previous offshore accidents have highlighted the critical importance of clearly separating under different agencies the responsibility to help enable oil production from the need to manage safety and protect the environment.	
4. Operator Liability Limits	**Administrative Monetary Penalties Regulations**				The current design of Canada's liability rules for offshore oil operations potentially leaves governments, taxpayers, and communities vulnerable to clean up costs above $1 billion in the event of a significant accident or spill. Absolute liability ("without proof of fault or negligence") is capped at $1 billion CAD; however, liability is unlimited when operator negligence is proven. Liability limits not only shape and limit any claims for post-spill compensation, but they can also	**Unlimited financial and environmental liability, even in the case of unforeseeable events, would help to ensure that companies take every necessary precaution to prevent accidents from occurring and is consistent with the 'polluter pays' principle. Operators must also be able to prove to the regulator that they have the financial capacity to pay for the full amount of clean-up costs and all associated damages.**

					create an incentive for oil companies to pursue excessively risky activities, knowing they will only bear the full cost of liability (beyond the absolute liability cap) if fault or negligence is established and upheld in court. Other countries do not have caps on liability, regardless of fault, yet this has not discouraged interest or investment in offshore drilling. $1 billion in absolute liability is too low to cover the costs associated with catastrophic spills especially in the North Atlantic where environmental conditions would frustrate spill response efforts.	
5. Climate risk	PART 6 Drilling and Production	Venting Limit	83(2) and (3)	**83(2)** The operator must ensure that the emissions of gas from the seals of a centrifugal compressor or reciprocating compressor at an installation are • **(a)** captured and routed to gas conservation equipment or gas destruction equipment; or	The Framework Regulations only consider emissions of gas and continue to allow the Atlantic Offshore Petroleum Boards to make decisions about whether and under what conditions offshore oil and gas activities can be carried out without accounting for climate change and the widely accepted need to reduce greenhouse gas emissions. The regulator is not obligated to recommend the rejection of a project that is inconsistent with national or provincial climate commitments or has an inadequate strategy to minimize or eliminate greenhouse gas emissions.	**The Framework Regulations, under part 6 (Drilling and Production) should include a clause to ensure that oil and gas production in the Atlantic offshore is consistent with national and global climate goals.** **The Greenland Government must attach importance to the consideration for avoiding impairment or any other negative impact on the climate when it makes a decision on the granting of a license under its**

				• **(b)** routed to vents that release those emissions into the atmosphere. Measure of flow rate of emissions **(3)** The operator must ensure that the flow rate of emissions of gas released from vents referred to in paragraph (2)(b) is measured by means of a continuous monitoring device.		**Mineral Resources Act (section 56). Canada can do likewise.**
6. Ecologically or culturally important areas	**PART 4** General Requirements for Authorized Works and Activities	Safety and protection of environment	39	Safety and protection of environment **39** An operator must take all measures necessary to ensure safety and the protection of the environment during any authorized work or activity, including ensuring that	The Framework Regulations do not prevent drilling or seismic testing in ecologically and biologically significant areas, nor in high-risk or culturally important areas.	**In keeping with the Precautionary Principle and with the express consent of Indigenous rights holders, areas identified as high-risk, ecologically and biologically significant, or culturally important must be placed off-limits to oil and gas activities. This includes sensitive benthic areas, Marine Protected Areas, marine refuges and critical habitat for species at risk.** **Part 4** **39 "An operator must take all measures necessary to ensure safety and the protection of the environment during any authorized work or activity, including ensuring that no**

						drilling or exploration activity takes place in any area identified as high-risk, ecologically and biologically significant, or culturally important."
7. Seismic testing and geophysical surveys	**PART 5** Geoscientific Programs, Geotechnical Programs and Environmental Programs	Equipment, Materials and Property	49(a)	**49** An operator must ensure that **(a)** all equipment and materials that are necessary to conduct a geoscientific program, geotechnical program or environmental program are handled, installed, inspected, tested, maintained and operated taking into account the manufacturer's instructions and industry standards and best practices;	The Framework Regulations are insufficient to ensure the safety of marine wildlife when conducting underwater seismic blasting operations and they are not consistent with the current state of scientific knowledge of the impacts of underwater noise. Much of the prescriptive language pertaining to equipment for geophysical testing (i.e., seismic programs) has been removed in favour of an overreliance on performance-based standards that require equipment simply to be "maintained and operated taking into account the manufacturer's instructions." Significant gaps in knowledge exist regarding the effects of seismic air gun noise on marine mammals, and we do not yet have sufficient information on the abundance and distribution of some marine wildlife in the North Atlantic region.	**In place of "best practices" in section 49(a) in part 5, the Framework Regulations should explicitly require the use of the "Best Available and Safest Technologies" (BAST) regarding the use of seismic programs. While the importance of diver safety is mentioned, there is no mention of the safety of marine wildlife and the risks that seismic testing programs can pose to the marine environment. A BAST requirement would not prescribe the use of specific technologies but would require that safer alternatives be used whenever possible.** **The most effective mitigation measures for seismic air gun surveys are:** • **remove the surveys from areas/seasons rich in marine life and sensitive species** • **lower the source level (quiet the noise)**

						• **require the use of air gun alternatives such as Marine vibroseis (MV), which can drastically cut noise levels and limit the frequencies (pitches) of noise output.**
8. Improve oil spill response capacity	**PART 2** Authorization	Contingency Plan	Part 2 12(1) 12(4)	Part 2 12 (1) An operator must develop a contingency plan that sets out the procedures (including emergency response procedures), practices, resources and monitoring measures that are necessary to effectively prepare for and mitigate the effects of any accidental event. 12 (4) If a spill-treating agent is being considered for use as a spill response measure, the contingency plan must include the following additional documents and information: (a) the name of the chosen spill-treating agent and an assessment of its efficacy in treating the potential sources of pollutants, including the	There are no requirements in the Framework Regulations to ensure that a major oil spill could be cleaned up quickly and effectively. Once again, rather than requiring only that the operator "set out" emergency response procedures and that the spill treating agent be named, the Framework Regulations should explicitly require the use of the 'Best Available and Safest Technologies' to help ensure that a major spill could be cleaned up and that the safest, most effective spill treating agent be used based on regional conditions and the best available science. There are no actual legal requirements in Canada to ensure that sufficient people and equipment could respond to a spill from a drilling rig or a ship, nor any obligations to ensure that such a response would occur within the time frame required by law. The industry's agent of choice, Corexit, can be toxic, sometimes more so than oil, and cold weather	**The Framework Regulations must ensure effective and efficient oil response capacity. Immediate steps, including substantial investment, must be taken to provide adequate response capabilities and infrastructure support.** **Part 2: 12 (1) "An operator must develop a contingency plan that sets out the procedures (including emergency response procedures), practices, resources and monitoring measures that use the best available and safest technologies and are necessary to effectively prepare for and mitigate the effects of any accidental event.** **12(4) "(a) the name of the chosen spill-treating agent, how much of it will be required and an assessment of its efficacy and toxicity in treating the potential sources of pollutants,**

				results of any tests conducted for the assessment and a description of those tests; 11(2)(f) a description of all the discharge streams and the limits of any discharge into the environment, including any waste material;	and the presence of ice can make it difficult to apply.	**including the results of any tests conducted for the assessment and a description of those tests;"** **Add: "The spill treating agent shall not be used in environments that are more sensitive to chemical dispersants."** **11(2)(f) Add: "Discharge of drilling muds, cuttings, sanitary wastes, produced water, and all other discharges should be prohibited where technically feasible methods of collection exist."**
9. Support Operations and Training	PART 9 Support Operations	Procedures and training program	171(2)			**Personnel working in the North Atlantic must be required to have unique training in regional competencies and qualifications.**

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WWF-CANADA SUBMISSION ON PROPOSED NEWFOUNDLAND AND LABRADOR OFFSHORE AREA PETROEUM OPERATIONS FRAMEWORK REGULATIONS

Contents

1. Introduction

Offshore oil and gas activities represent a genuine threat to the marine environment and the stability of the global climate system. Even if nothing goes wrong, there are unavoidable impacts from each phase of oil development - seismic exploration, drilling waste (fluids and cuttings), pipelines, offshore and onshore terminals, tanker traffic, and so on. If a major spill or a well blowout were to occur in the Atlantic offshore, it would seriously imperil the surrounding marine environment, potentially destroying habitat for whales, fish, sea birds, and many other animals. The consequences for local communities, some of whom depend on healthy and clean waters for their livelihoods could be devastating. Moreover, the very purpose of oil production is to extract and burn more oil, which increases greenhouse gas (GHG) emissions and exacerbates the global climate crisis at a time when scientists say we need to be rapidly reducing GHG emissions.

The Frontier and Offshore Regulatory Renewal Initiative (FORRI) is a joint federal-provincial process that was established to, among other purposes, review and update Canada's offshore oil and gas regulations, which, according to the federal government, "were first established upwards of 34 years ago" and "use prescriptive language, require the use of outdated technologies and/or methodologies and incorporate a number of standards and codes that are now obsolete."[1] Consequently, on June 18, 2022 the Canadian government published the *Canada-Newfoundland and Labrador Offshore Area Petroleum Operations Framework Regulations* (the Framework Regulations) in Canada Gazette I with the goal of repealing existing regulations and replacing them with "one consolidated, comprehensive framework regulation in each of the Canada-NL and Canada-NS offshore areas, allowing greater ease of use by regulated parties and regulators."[2]

Some of the conditions that can increase the risk of an accident or well blowout are present in the North Atlantic region, including deep water, extreme weather and the need for exploration and development drilling. For instance, the 2018 Husky Sea Rose FPSO accident off the coast of Newfoundland and Labrador, the largest spill in the province's history, was the result of a severe storm (not uncommon) and poor judgment by the operator to resume operations by attempting to reconnect a flowline in high sea state conditions – storm conditions deemed unsafe to deploy on-water response to the spill. In its review of the Deepwater Horizon disaster, a national commission noted that "deep water drilling brings new risks, not yet completely addressed by the reviews of where it is safe to drill, what could go wrong, and how to respond if something does go awry."[3] The elevated risk of operating in this extreme environment makes it incumbent upon the government to ensure the world's highest standard of regulations are in place to govern oil and gas off the coast of Newfoundland and Labrador.

The new Framework Regulations make some welcome and necessary regulatory updates; however, the regulations will not be sufficient to ensure that the highest possible science-based safety and environmental standards are met, including robust and effective well control and emergency response measures. In addition, the new regulations

[1] https://www.gazette.gc.ca/rp-pr/p1/2022/2022-06-18/html/reg5-eng.html
[2] https://www.gazette.gc.ca/rp-pr/p1/2022/2022-06-18/html/reg5-eng.html
[3] https://www.govinfo.gov/content/pkg/GPO-OILCOMMISSION/pdf/GPO-OILCOMMISSION.pdf#page=14

will not ensure that oil and gas development avoids ecologically-sensitive marine areas and is consistent with global and domestic climate goals, and Indigenous rights and agreements. In fact, the Framework Regulations are as notable for their inadequate provisions as they are for the critical issues they omit – most notably, climate change, drilling in ecologically or culturally sensitive areas, and Indigenous rights. This submission therefore proposes a series of proven measures, specific to the North Atlantic, which should be required before any offshore oil and gas activities go ahead. These measures and regulatory reforms, which are described in detail below, must be incorporated into the Framework Regulations, where appropriate, or in other relevant pieces of legislation and/or regulations:

1. **Best Available and Safest Technologies:** Require operators to comply with a best available and safest technologies (BAST) mandate, as found in the U.S., which is region-specific and verified by a qualified third party.

2. **Risk assessment:** Require project risk to be reduced to a level that is as low as reasonably *possible* (not *practicable*) and determined through an inclusive, collaborative process involving the regulator, the operator, relevant stakeholders, and independent third-party experts.

3. **Canada-Newfoundland and Labrador Offshore Petroleum Board:** Separate the Board's responsibility to facilitate and approve drilling projects from its safety and environmental protection mandate.

4. **Liability:** Make operator liability for oil spills unlimited regardless of fault.

5. **Climate change:** Ensure all new oil and gas production and consumption is consistent with national and global climate goals.

6. **Ecologically and culturally sensitive areas:** Respect Indigenous rights and agreements, and prohibit petroleum activities in or near high risk, culturally important and ecologically sensitive areas.

7. **Seismic testing:** Strengthen evidence-based rules for seismic programs and require alternatives that are less harmful to marine wildlife.

8. **Oil spill response:** Regulations must ensure effective and efficient oil response capacity.

WWF-Canada would like to note that the Framework Regulations include the following statement: "*The World Wildlife Fund commended the government partners' efforts in modernizing the regulatory framework and seeking the advice of stakeholders throughout this process, noting its view that the modernization of the offshore regulatory regime in Canada was long overdue. WWF identified a few areas of concern, including the role of the regulators in interpreting and applying more outcome-based regulations in the absence of prescribed standards, and the inherent principle that operators must ensure that risk is reduced to as low as reasonably practicable*."

We feel that this statement is misleading and we ask that it be removed or amended as it seems to indicate that we support the government's proposed approach to regulatory reform. We do not. While we feel that the modernization of offshore regulations is indeed long overdue, we have more than "a few areas of concern." **The proposed Framework Regulations are flawed and will not be sufficient to ensure that petroleum operations can be carried out safely with the lowest possible risk to the marine environment.**

2. The unique challenges of offshore drilling in Canada's Atlantic offshore region

The North Atlantic should not be considered as one homogeneous region as operational conditions of offshore operations may vary depending on, for example, water depth, proximity to existing support infrastructure in the area and the presence of sea ice. Nevertheless, in general ocean drilling in the region is substantially different from drilling operations in other parts of the world as it presents many distinct safety and environmental concerns. Extreme weather, winter darkness, sea ice, significant geographic distances, deep water, the vulnerability of certain species and ecosystems, and limited environmental response equipment make oil and gas operations more difficult (and expensive) and effective oil spill response much more challenging. In the event of an accident, capping wells could be more difficult, oil spill clean-up may take longer, environmental damage could be more severe, and local communities could suffer substantial harm. The North Atlantic has sensitive and unique ecosystems that are vulnerable to disturbance and are not always well-studied.

In addition, the fishing industry and some communities are heavily dependent on a healthy marine environment for their livelihoods and well-being. The impacts of a major spill or well blowout on the local fishery could be catastrophic and could continue for years. For example, thirty years after the Exxon Valdez spilled 4.2 million liters of crude oil into Prince William Sound in Alaska, the fishing industry has not fully recovered and many Alaskan beaches remain polluted to this day with an estimated 20,000 gallons (75,000 liters) of crude oil buried just inches below the surface[4]. Taken together, these factors substantially increase the risks presented by offshore oil and gas operations in the North Atlantic. [5]

The 2010 Deepwater Horizon blowout demonstrated both the potential risks of offshore drilling and the difficulties involved in cleaning up a spill even in the Gulf of Mexico, a heavily populated region with ample spill response capacity and mild temperatures. Only 25% of the 210 million gallons (800 million litres) spilled into the Gulf was actively recovered (skimmed, burned, or recovered at the wellhead) with another 10%-20% chemically dispersed,[6] and recent research has shown that previously unknown "invisible oil" from the disaster "concentrated below the water's surface and (was) toxic enough to destroy 50% of the marine life it encountered."[7]

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[4] https://www.nytimes.com/2010/05/06/us/06alaska.html
[5] http://www.nap.edu/read/18625/chapter/2#2
[6] http://masgc.org/oilscience/oil-spill-science-where-did-oil-go.pdf
[7] Berenshtein et al. Feb. 2020. Invisible Oil beyond the Deepwater Horizon satellite footprint. *Science Advances.* Vol. 6, no. 7. https://advances.sciencemag.org/content/6/7/eaaw8863

Even *after* the Deepwater Horizon catastrophe, there were seven losses of well control – the precursor to a blowout – in the Gulf of Mexico between 2010 and 2015. Operators are attempting increasingly technically ambitious operations; they are expanding their operations to more extreme environments and attempting to tackle ever more challenging projects.

There is far less response capacity in the Newfoundland-Labrador offshore and the environmental conditions are much harsher. The chances of implementing effective oil recovery, even under ideal conditions would be very challenging. The cold conditions, presence of sea ice and lack of daylight during certain times of the year will compound the difficulty of spill response, and cold seas would slow down the oil-digesting bacteria that are crucial in reducing the immediate impact of a spill.[8]

The 2018 Husky Sea Rose spill was the second serious incident involving the Sea Rose FPSO[9] in the last few years. In May 2017, a huge iceberg came within 180 metres of the same vessel, so close that the crew were told to "brace for impact," yet oil production was not halted.[10] That two serious incidents could occur over such a short time span indicates the hazards common in the North Atlantic and highlights the need for adequate preventative measures to ensure that a major spill never takes place and for an extremely effective oil spill response strategy on the part of the operator. At this point, however, it is not clear how an effective response to a major spill in the North Atlantic would be carried out, if it is even possible. Alaska has a legal requirement that equipment be on-hand within 24 hours to cap a well blowout, an obligation that is not required in Canada. Nevertheless, the head of the U.S. Coast Guard has stated that the country is still not prepared to clean up an oil spill in the extremely challenging Alaskan offshore.[11]

> *"We saw during Deepwater Horizon, whenever the seas are over four feet, our ability to mechanically remove oil was virtually impossible. Four-foot seas up there [in the Arctic] would probably be a pretty darned good day… especially if it's in a season where it's inaccessible; that really doubles, triples the difficulty of responding."*

Four-foot seas in the North Atlantic are also very common, which would significantly impede the effectiveness of mechanical oil spill recovery and removal. In addition, drilling project locations tend to be far offshore (500 km approximately), which poses additional challenges to mounting fast and effective spill response. Research amassed to date through various studies suggest that oil behaves differently in icy, freezing water than in warmer waters. Furthermore, the combination of natural variability and climate-forced changes in the northern marine system make it particularly challenging to predict the ice conditions from one year to the next.[12]

The economic viability of Atlantic offshore oil depends on a variety of factors including global oil prices, technological capacity, and the location of the resource. As of this writing, oil prices are

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[8] Donald L. Gautier et al, *Assessment of Undiscovered Oil and Gas in the Arctic*, 324 Science 1175, 1175 (2009); Nat'l Comm'n Report, *supra* note 1, at 41, 73, 174, 300-05.

[9] Floating, Production, Storage and Offloading Vessel

[10] https://www.cbc.ca/news/canada/newfoundland-labrador/husky-energy-searose-production-federal-court-application-1.4658934

[11] Waldman, S. July 19, 2017. The U.S. Is Not Ready to Clean Up an Arctic Oil Spill. *Scientific American.* https://www.scientificamerican.com/article/the-u-s-is-not-ready-to-clean-up-an-arctic-oil-spill/

[12] Wilkinson, J. et al. 2017. Oil spill response capabilities and technologies for ice-covered Arctic marine waters: A review of recent developments and established practices. *Ambio* 46 (Supp 3): S423-S441.

high; however, they have been extremely volatile over the past two years, at one point temporarily plunging below $0 per barrel.

The marginal profitability of North Atlantic oil may compel companies to find ways to reduce operational costs in order for their drilling projects to be viable. According to Dr. Robert Bea, a world-renowned expert on offshore engineering and risk management, "One of the big drivers for increasing production is decreasing costs (decreasing protection). The balance progressively shifts until there is a major system failure — a monetarily-driven spiral to disaster."[13]

Of course, the best way to minimize the damage caused by an accident or an oil spill is to ensure that it never happens in the first place. It is therefore imperative that the government ensures the right regulations and oversight procedures are in place so that the high risks of offshore oil activities in the North Atlantic are minimized to the greatest extent possible and companies cannot cut corners in order to reduce their costs.

3. The Shortcomings of the proposed Framework Regulations

In Newfoundland and Labrador, the exploration, production, processing and transportation of oil and gas is governed by the Canada-Newfoundland and Labrador Atlantic Accord Implementation *Act* (and a variety of regulations under the *Act*) with the main purpose being to promote the safety of the public and workers, to protect the environment, and to conserve oil and gas resources.[14]

However, there are a number of shortcomings in the proposed Framework Regulations including:

- Insufficient measures to compel adequate and timely oil spill response capacity. No legal regulations to ensure that sufficient people and equipment could respond to a spill from a drilling rig or a ship, nor any obligations to ensure that such a response would occur within a legally required time frame.
- Regulations do not require the use of the Best Available and Safest Technologies (BAST), or that a capping device or relief drilling rig be on site during drilling operations in the event of a loss of well control.
- Regulations do not prevent drilling in ecologically sensitive marine ecosystems, culturally important or high-risk areas.
- No requirement to reduce accident risk to a level that is as low as (reasonably) *possible* (i.e., as opposed to 'as low as reasonably *practicable*').
- No requirement to include local stakeholders, Indigenous groups or members of the broader Canadian public in determining tolerable levels of risk.
- Insufficient liability and financial responsibility rules to ensure that companies (and not taxpayers) are fully liable for clean-up and compensation costs and have the capacity to pay.

[13] https://www.halifaxexaminer.ca/featured/the-worlds-top-expert-on-deep-sea-drilling-disasters-worries-about-the-relatively-high-likelihoods-of-a-blowout-at-bps-scotian-shelf-operation/#1.%20Blowout

[14] https://www.assembly.nl.ca/legislation/sr/statutes/c02.htm#131_1

- Inadequate separation of the regulator's primary responsibility to ensure economic benefits from oil and gas development from its responsibility to enforce safety and environmental regulations and conduct impact assessments.
- No requirement to have any scientific expertise, such as marine biologists or climate scientists, or Indigenous representation on the Board of Directors of the CNLOPB.
- No science-based rules for seismic blasting activity including minimum safe distance requirements specific to the North Atlantic marine environment.
- No requirement to ensure decisions about whether and under what conditions offshore oil and gas activities are consistent with Canadian carbon reduction commitments and with Indigenous rights and agreements.

Some of these additional measures and requirements *could* be imposed on an operator by the CNLOPB at the time of operations licensing and authorization, but the Board is under no explicit obligation to do so and it would be up to the regulator (which is also mandated to ensure economic benefits from oil and gas, as per the Accord Acts) to determine on a case by case basis what additional measures may be required.

In addition, other regulations such as liability limits, financial responsibility, seismic testing rules and impact assessment review panels are enshrined in legislation and cannot be adapted or applied to the Newfoundland and Labrador context by the CNLOPB. Explicit rules for operating in the North Atlantic offshore must be enshrined within the Canada-Newfoundland and Labrador Atlantic Accord Implementation *Act* and tailored specifically to the unique operational and environmental challenges of the region in order to minimize risks to the marine environment to the greatest extent possible.

4. Eight requirements for safety and environmental protection in Canada's North Atlantic

Recommendation #1: Develop specific rules for offshore operations in the North Atlantic that require the use of the Best Available and Safest Technologies

Comment/Problem: The Framework Regulations do not require an operator to cap a blowout or have a relief drilling rig on site within a prescribed period of time and do not explicitly require the use of the 'best available and safest technologies' that have been proven effective in the past.

Recommendation: The regulations must require (and not just "allow for") the use of the 'Best Available and Safest Technologies' (BAST) that are appropriate to the region, including the requirement that operators keep capping stacks and relief drilling rigs on or near site during drilling operations so they can promptly respond to a blowout or other loss of well control within 24 hours.

Re: Parts 2 and 6

Part 6:
Well Integrity
Well control

68 (1) An operator must ensure that adequate procedures, materials and equipment are in place and used throughout the life cycle of the well to prevent the loss of well control.

Reliable well control equipment

***(2)** The operator must ensure that reliable well control equipment is in place to detect and control kicks, prevent blowouts and safely conduct all well operations.*

Part 2
12(3) the contingency plan must also include a description of the source control and containment measures to stop the flow from an uncontrolled well and to minimize the duration of a spill and its environmental effects,

11 (1) An operator must develop an environmental protection plan that sets out the procedures, practices, resources and monitoring measures that are necessary to protect the environment from the proposed work or activity, including target levels of safety and hazard management.

Part 6: Design measures

103(6) The design of an installation that is to be operated in a cold climate must include measures to

- *(a) ensure its functionality in a cold climate, including in the case of property changes in fluids;*
- *(b) ensure the functionality in that climate of all systems and equipment that are critical to safety and the protection of the environment, including the systems and equipment needed to operate in the event of an emergency;*

Summary

There are no requirements anywhere in the Regulations for the operator to use the best available and safest technologies appropriate to the drilling region. The Framework Regulations require only "adequate" procedures and equipment and that the operator provide simply a "description of the source control and containment measures to stop the flow from an uncontrolled well and to minimize the duration of a spill and its environmental effects." Moreover, an operator must develop "an environmental protection plan that sets out the procedures, practices, resources and monitoring measures that are necessary to protect the environment from the proposed work or activity, including target levels of safety and hazard management". Again, no technology standard is mandated. This is not good enough.

The Well Control regulations rely too heavily on performance standards and should instead *mandate* the use of the 'Best Available and Safest Technologies' (i.e., a BAST requirement) for well control, containment systems, and other procedures that are designed specifically for the extreme conditions found in this region. BAST utilizes a performance-based approach to technology solutions but establishes a minimum standard that relies on consistent and verifiable testing and evaluation of a given technology's operational history, identifies candidate technologies (suggested by industry) for BAST determinations, then evaluates these technologies using consistent and verifiable testing protocols by a verified third party. BAST does not restrict operators to the implementation of specific technologies but would require the application of practices that have been shown to be successful and relevant to those projects that have risk characteristics similar to past operations.

In addition, the regulations should require operators to have immediate access to surface and subsea containment resources (i.e., a capping stack and containment dome) that would be adequate to promptly respond to a blowout or other loss of well control where a capping stack must be onsite within 24 hours.

Rationale

A loss of well control is a release of fluid and/or gas from the well and can be a pre-cursor to a full blowout. It is generally caused by unexpected reservoir pressure, a formation kick or a failure of surface equipment or procedures. Wellhead systems and drilling rigs have multiple, redundant pressure-control systems installed (e.g., drilling muds, blowout preventers (BOPs), and control valves), but all mechanical devices have a failure risk.[15] On a drilling rig, a BOP is the last pressure barrier; if this barrier fails, an uncontrolled well blowout occurs. Even with a BOP in place, blowouts with a flow path to the sea bottom outside the casing cannot be controlled with BOPs and such blowouts are reported to constitute between 20% and 55% of offshore

[15] Arctic Council. 2009. *Arctic Offshore Oil and Gas Guidelines.* Protection of the Arctic Marine Environment Working Group.

drilling blowouts, thus more than half of drilling blowouts may not be susceptible to any BOP control or effects.[16]

The risk of a well blowout in the Atlantic offshore is difficult to assess because there is very little empirical data on which to base a risk assessment. According to the SINTEF database, an average of 2.3 well releases or blowouts per year occurred in the U.K. and Norwegian waters between 1980 and 2008. Even *after* the Deepwater Horizon catastrophe, there were seven losses of well control – the precursor to a blowout – in the Gulf of Mexico between 2010 and 2015. Operators are attempting increasingly technically ambitious operations; they are expanding their operations to new, often environmentally sensitive areas and the industry continues to tackle ever more challenging projects.

Requirements for well control, design of the drilling rig, the blowout preventer, cementing practices and other safety technologies are therefore a crucial element in any offshore regulatory regime. Currently, proposed the Framework Regulations require that an operator prove that, in the event of a loss of well control, "the operator must ensure that any necessary corrective measures to rectify the situation are taken without delay" (pg. 206) and the project proponent must describe in its contingency plan the "source control and containment measures to stop the flow from an uncontrolled well" (pg. 176). However, there are no regulations requiring subsea containment resources (such as capping stacks and relief drilling rigs) to be on site during drilling operations or to demonstrate access to these resources within a prescribed period of time after well control is lost.

A number of measures that have been proven effective can be taken to reduce the risk of a loss of well control, respond to a blowout and eliminate or minimize the impacts of regular operations. These include, but are not limited to, the following requirements:

- Operators must be required to have immediate access to surface and subsea containment resources that would be adequate to promptly respond to a blowout or other loss of well control, as is the case in Alaska, where a capping stack must be onsite within 24 hours.[17]
- Drilling rigs must have redundant BOP systems installed to ensure the equipment functions in an emergency.[18] Subarctic platforms that are used off the coast of Newfoundland and Labrador need to be much stronger than temperate-water platforms.[19]

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[16] Bercha, Frank. G. 2010. Arctic and Northern Offshore Oil Spill Probabilities. *Proceedings in the International Conference and Exhibition on Performance of Ships and Structures in Ice (ICETECH 2010).* Anchorage, Alaska. September 20-23, 2010.

[17] https://www.federalregister.gov/documents/2016/07/15/2016-15699/oil-and-gas-and-sulfur-operations-on-the-outer-continental-shelf-requirements-for-exploratory

[18] Pew Charitable Trusts. Sept. 2013. *Arctic Standards: Recommendations on Oil Spill Prevention, Response, and Safety in the U.S. Arctic Ocean.*

[19] Michael E. Utt, Union Oil Co. of California, "Sea Ice Forces and the State of Technology of Offshore Arctic Platforms," Journal of Petroleum Technology, no. 37, January 1985: 21-6. Calculated using:—K.D. Vaudrey, "Derivation of Ice Forces for a Large Arctic Gravity Structure." Paper presented at the 1982 Arctic Offshore Drilling Platform Symposium, Global Marine Development Inc., Los Angeles, 1982; and —T. Ralston, "Ice Force Design Considerations for Conical Offshore Structures." Proceedings of the Fourth International Conference on Port and Ocean Engineering Under Arctic Conditions, Newfoundland, 1977.

- BOP standards should be more stringent such that they are suitable for operation in sub-freezing conditions, include third-party verification and periodic recertification, and redundant (double) blind shear rams.
- Fuel transportation, supply, and oil spill response vessels and tugs that are part of exploration, development, or production operations must be designed with vessel hulls and specialized systems to function safely in cold water.
- Discharge of drilling muds, cuttings, sanitary wastes, produced water, and all other discharges should be prohibited where technically feasible methods of collection exist.
- In addition to traditional exploration and production education, training, and experience, personnel working in the North Atlantic must be required to have unique training in regional competencies and qualifications.

These are just a few examples of requirements that would be necessary to ensure the safety and minimize the risk of an offshore drilling project in the North Atlantic. As offshore operations are becoming increasingly complex and technologies are regularly changing, it is beyond the scope of this submission to list all possible technical requirements. More critical is the need for Canadian regulations to require the overarching application of specific technologies that comply with a 'Best Available and Safest Technology' standard, which independent technical experts can then apply against a project proposal at the impact assessment and license authorization stage. The Arctic Council recommended just such an approach in 2009 when it recommended "the use of best available technology/techniques and best available practices for offshore oil and gas activities."[20]

Best Available and Safest Technologies (BAST) requirement

The Framework Regulations are proposing a "technology neutral approach, which would allow for the use of best available technologies and/or methodologies" (pg. 126) and allow operators (with approval of the Board) to ensure "innovative approaches that enhance safety" (pg. 132). While this is a positive development, it does not *mandate* the use of best available and safest technologies in well control, containment systems, or other procedures. It only "allows for" the use of BAST technologies, which is not sufficient.

In contrast, Greenland's regulations under the *Mineral Resources Act* are supplemented by the overall objective of aiming "to *ensure* that activities under the *Act* are securely performed as regards safety, health, the environment, resource exploitation and social sustainability as well as properly performed according to acknowledged best international practices under similar conditions" (emphasis added).[21] Note that Greenland's regulations do not "allow for" BAST; they aim to *ensure* the BAST requirement is met.

The U.S. Outer Continental Shelf Lands Act (OCSLA) also requires the use of "best available and safest technologies" on all new drilling and production operations, with only the secretary

[20] The Arctic Council's 2009 'Arctic Offshore Oil and Gas Guidelines' defines "best available techniques" as the "latest stage of development (state of the art) of processes, of facilities, or of methods of operation" and "best environmental practice" as the application of the most appropriate combination of environmental control measures and strategies.

[21] *MRA*, s 1(2).

having the authority to determine whether the incremental benefits are "clearly insufficient" to justify the incremental costs of utilizing BAST.[22]

> *(b) Use of best available and safest economically feasible technologies. In exercising their respective responsibilities for the artificial islands, installations, and other devices referred to in section 1333(a)(1) of this title, the Secretary, and the Secretary of the Department in which the Coast Guard is operating, shall require, on all new drilling and production operations and, wherever practicable, on existing operations, the use of the best available and safest technologies which the Secretary determines to be economically feasible, wherever failure of equipment would have a significant effect on safety, health, or the environment, except where the Secretary determines that the incremental benefits are clearly insufficient to justify the incremental costs of utilizing such technologies.[23] (Emphasis added.)*

BAST utilizes a performance-based approach to technology solutions but establishes a minimum standard that relies on consistent and verifiable testing and evaluation of a given technology's operational history, identifies candidate technologies (suggested by industry) for BAST determinations, then evaluates these technologies using consistent and verifiable testing protocols by a verified third party. BAST does not restrict operators to the implementation of specific technologies but would require the application of practices that have been shown to be successful and relevant to those projects that have risk characteristics similar to past operations. Best practices for a particular source will change with time in the light of technological advances, economic and social factors, as well as changes in scientific knowledge and understanding.[24] Thus operators would not be tied to the implementation of specific technologies as the BAST standard would change and evolve over time. Industry operators themselves called for such a requirement in 1991 stating "the best available equipment and procedures are the minimum acceptable" in a report for the Beaufort Sea Steering Committee.[25]

The risks of offshore drilling in the North Atlantic are too high to justify allowing the regulator to decide on a case-by-case basis what constitutes "reasonably practicable" procedures and equipment to ensure safety and environmental protection. It is not clear how the CNLOPB will independently determine what constitutes a best industry standard or best available technology. The Framework Regulations only state that the Board must approve the operator's proposed approach. Given the Board's conflicting mandate to help facilitate offshore oil production and to ensure safety and environmental protection (see #3 below), the Framework Regulations must require that an independent technical expert is required to evaluate whether a project proposal meets the BAST requirement.

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[22] https://www.govinfo.gov/content/pkg/USCODE-2015-title43/html/USCODE-2015-title43-chap29-subchapIII-sec1347.htm

[23] https://www.govinfo.gov/content/pkg/USCODE-2015-title43/html/USCODE-2015-title43-chap29-subchapIII-sec1347.htm

[24] Arctic Council. 2009. *Arctic Offshore Oil and Gas Guidelines.* Protection of the Arctic Marine Environment Working Group.

[25] AOE Consultants. "Operating Seasons for Beaufort Sea Drilling Systems." Prepared for Beaufort Sea Steering Committee. February 1991.

Performance-based vs. Prescriptive Regulations

Well control regulations under the Framework Regulations are largely performance-based in that they do not prescribe the use of any specific technologies. It is up to the CNLOPB to determine whether an operator has adequate procedures and equipment in place to prevent and respond to the loss of well control. No specific well control technologies such as capping stacks or containment domes are prescribed in Canadian regulations or required on site and there are no maximum response time limits. Underlying this approach is the assumption that performance-based rules will necessarily lead to more flexibility for operators than prescriptive rules in adopting new technological innovations and better outcomes for safety and environmental protection.

Performance-based regulations are common in some industries and can have the advantage of allowing for the adoption of new technologies. While Norway uses largely performance-based well-control and drilling regulations, the country also has the most experience using what is known as a 'Safety Case regime'.[26] [27] Norway's regulator, the Petroleum Safety Authority, is considered the leader in offshore safety practices. The PSA is responsible only for oversight, safety and environmental protection, and is not responsible for enabling or facilitating offshore drilling, as is the case for the CNLOPB. The PSA has established a "good collaboration" with offshore industry players, labor unions and relevant specialists, such that all sectors of the industry have confidence in the PSA's reports. Moreover, Norway's citizens are informed about risk levels and individual company practices through the PSA website, which has summaries of all audit and verification reports, investigations, consents to operator activities, and enforcement notices. The PSA reports exemplify a dialogue between industry, labor, the citizenry and the regulator built on a strong foundation of trust. As discussed in Recommendation #3 (below), the CNLOPB has not established anywhere near the same level of trust with the Canadian public, quite the opposite.

It is true that reliance on a purely prescriptive regulatory regime may not work as well for a variety of reasons (e.g. places more responsibility on the regulator, little flexibility, extremely variable conditions, lack of history/data to apply rigorous requirements, etc.).[28] However, a heavier reliance on performance-based approaches will also have challenges and will require a much greater need for collaboration between regulators and operators since the risks of an accident are higher due to the potentially catastrophic consequences and our limited ability to respond effectively and promptly to a major spill. In a 2013 report, Natural Resources Canada concluded that "when the risk or consequences associated with an activity are high…outcome-based regulations may not be appropriate; particularly if a suitable technology already exists."[29]

The United States and Russia have retained or even strengthened some of their prescriptive rules in the offshore petroleum industry in recent years. For instance, in 2016, the United States government introduced a set of prescriptive rules aimed at preventing the kind of equipment

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[26] Weaver, Jacqueline. Offshore Safety in the Wake of the Macondo Disaster: The Role of the Regulator. Houston Journal of International Law. Vol. 36:2. March 2014.

[27] A safety case is a document produced by the operator of a facility that identifies the hazards and risks, describes how the risks are controlled, and describes the safety management system in place to ensure the controls are effectively and consistently applied and that safety performance is continually monitored and improved. Once a safety case has been accepted by the regulator, it becomes the rules with which the operator must comply.

[28] PAME, 2014.

[29] http://www.nrcan.gc.ca/mining-materials/publications/11732#a0

failures that led to the disastrous 2010 Deepwater Horizon oil spill in the Gulf of Mexico.[30] An investigation into the blowout revealed that the oil industry had insisted upon the safety of its operations and the reliability of its blowout preventers.[31] In response to the accident, the government added stricter requirements to the design of undersea wells and tightened rules on blowout preventers, with no opt-out provision, such that the use of double shear rams is now required to provide backup in the event of equipment failure.[32] No such requirement exists in the proposed Framework Regulations.

In justifying the new BOP rule, the U.S. Bureau for Safety and Environmental Enforcement (BSEE) wrote in 2016 that, despite the additional cost to operators, the prescriptive rule was "necessary to reduce the likelihood and/or severity of any oil or gas blowout, which can lead to the loss of life, serious injuries, and harm to the environment. As evidenced by the Deepwater Horizon incident… blowouts can result in catastrophic consequences… Despite new regulations (prior to 2016) and improvements in industry standards and practices since the Deepwater Horizon incident, loss of well control (LWC) incidents are happening at about the same rate five years after that incident as they were before".[33]

In 2016, the U.S. introduced an Arctic Drilling Rule which added new requirements to regulations for exploratory drilling and related operations.[34] The government justified the need for Arctic-specific rules by citing "the extreme environmental conditions, geographic remoteness, and a relative lack of fixed infrastructure, and existing operations."[35] Specifically, the regulations require companies to have the ability to drill a relief well and plug a compromised well permanently before seasonal ice encroaches on the drill site or within 45 days, whichever is sooner, and have access to – and the ability to promptly deploy – source control and containment equipment, such as capping stacks and containment domes, while drilling below or working below the surface casing.

> *Specifically, revised 250.471(a) requires that a capping stack be available and positioned to arrive at the well within 24 hours after a loss of well control, and a cap and flow system and a containment dome be positioned to ensure they will arrive at the well location within 7 days after a loss of well control.*[36]

In addition to adopting a "best available and safest technologies" (BAST) requirement as an overarching objective for all its offshore regulations for all components of an offshore drilling program, the government of Canada must also prescribe that capping/containment and relief drilling equipment be kept on or near site. This would not prescribe which capping technologies must be used but it would help to ensure that the operator meets a specified safety performance level while leaving less discretion for a CNLOPB panel to make judgments on what constitutes a "reasonably practicable" risk reduction measure, which is the current standard under the proposed Framework Regulations (see Recommendation #2 below).

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[30] https://www.gpo.gov/fdsys/pkg/FR-2016-04-29/pdf/2016-08921.pdf
[31] http://www.nytimes.com/2010/06/21/us/21blowout.html
[32] https://www.bsee.gov/sites/bsee.gov/files/fact-sheet/bsee/fact-sheet-proposed-well-control-rule.pdf
[33] https://www.bsee.gov/sites/bsee_prod.opengov.ibmcloud.com/files/aa11-bsee-well-control-ria.pdf
[34] https://www.bsee.gov/guidance-and-regulations/regulations/arctic-rule
[35] https://www.federalregister.gov/documents/2016/07/15/2016-15699/oil-and-gas-and-sulfur-operations-on-the-outer-continental-shelf-requirements-for-exploratory
[36] https://www.federalregister.gov/documents/2016/07/15/2016-15699/oil-and-gas-and-sulfur-operations-on-the-outer-continental-shelf-requirements-for-exploratory

Training and Third-party Inspection

In his Safety Culture Review for the National Energy Board's *Review of Offshore Drilling in the Canadian Arctic*, Dr. Mark Fleming cited four common training/cultural factors identified in inquiry reports from 17 major disasters, including the offshore disasters *Piper Alpha*, *Ocean Ranger*, and *Deepwater Horizo*n:[37]

- Tolerance of inadequate systems and resources
- Deviation from safety policy becomes normal
- Complacency
- Work pressure

The North Atlantic is a frontier area where some regions are characterized by specific physical environmental conditions and where technology and practices are pushing the limits of experience. Drilling in the Newfoundland-Labrador offshore entails specific professional competencies and qualifications that may involve extensive college training, apprentice training and/or long-term work experience. In addition to traditional exploration and production education, training, and experience, personnel working in the region require unique training in specific competencies and qualifications.

The proposed Framework Regulations require operators to "ensure that any person to whom a duty is assigned or who carries out a work or activity under these Regulations has the necessary experience, training, qualifications and competence to carry out that duty, work or activity safely and in compliance with these Regulations" (page 167). However, there are no explicit training requirements and it is up to operators to determine what constitutes the "necessary" experience and training and there is no requirement to inform the CNLOPB of personnel qualifications. By comparison, Greenland requires operators to undergo an operator prequalification program to demonstrate they have the expertise, experience, and capacity to "undertake drilling activities offshore in harsh remote Arctic locations" prior to leasing.[38] Norway and Greenland both require the operator to provide extensive information on personnel competencies and qualifications.[39]

The Canadian government must establish standards for drilling, completion, workover, and facility operation personnel training and qualifications (including cementing contractors, well stimulation contractors, and so on) that are specific to the North Atlantic context. Each operator should be required to demonstrate its exploration and production expertise, experience, capacity and qualifications as part of its exploration and production plans.

While the Framework Regulations do require that a Certificate of Fitness be prepared by an independent and recognized certifying authority, it is critical that an independent Well Control Engineer and/or drilling engineer review the well design/drilling plan and be onboard the rig at all times during drilling operations. Authorized and qualified representatives from the regulator should have the legal base to access the installations and to see all relevant documentation and

[37] Fleming, M. 2011. Importance of Safety Culture: Lessons from disasters. Presentation at the NEB roundtable Arctic drilling review. Inuvik, Canada

[38] Greenland Bureau of Minerals and Petroleum, Exploration Drilling Guidelines, May 2011.

[39] NORSOK Standard D-010, Well Integrity in Drilling and Well Operations, rev. 3, August 2004: 24.—Greenland Bureau of Minerals and Petroleum, Approval of up to 7 (Seven) Exploration Wells in Accordance with Section 15 of Licenses 2002/15, 2005/06, 2008/11, and 2011/16, Cairn Energy License Approval Letter, May 2011.

equipment at any time. As recommended by the Arctic Council, "Ensure continuous improvement through…both regular (and random) inspections; and conducting audits that examine company safety meeting records, maintenance logs, operator follow-up to known deficiencies, results of company internal audits, employee questionnaires, etc."[40] Finally, the report from compliance monitoring activities should be made available to the public.

Recommendation #2: Ensure project risk is reduced to a level that is 'as low as possible'

Comment/Problem: Operational risk analysis is carried out by the operator and need only be reduced to a level that is 'as low as reasonably practicable' in the Framework Regulations. Risk assessment and impact review panels are not required to include local stakeholder representation and do not represent the broader Canadian public.

Recommendation: Risk assessment must be determined through structured, collaborative processes that involves all stakeholders, with the objective being to reduce project risk to a level that is 'as low as (reasonably) *possible'*.

Re: part 8 preamble:

The proposed Regulations would establish a more robust framework for the design of installations, which would be rooted in comprehensive technical analysis and risk assessment, with the ongoing obligation of the operator to ensure that risk is reduced to as low as reasonably practicable.

Part 8

106 (1) An operator must ensure that an assessment of fire and explosion risks and of risks associated with hazardous gas and its containment is conducted for any installation

Part 3:

3(e) any measures that the operator intends to implement to reduce safety and environmental risks to a level that is as low as reasonably practicable in respect of the design of the installation, including its systems and equipment

Part 2:

2(f) identify all assumptions and control measures that are to be implemented to reduce the risks associated with the identified hazards to a level that is as low as reasonably practicable

Part 2: Environmental protection plan

[40] PAME, 2014.

11(1) An operator must develop an environmental protection plan that sets out the procedures, practices, resources and monitoring measures that are necessary to protect the environment from the proposed work or activity, including target levels of safety and hazard management.

Summary

The operator should not be responsible for or relied upon to carry out their own risk assessment analysis (part 8 106(1)). Who will determine whether project and installation risk has been reduced to a level that is "as low as reasonably practicable" and by what criteria will this assessment be made? This is a subjective evaluation and the Framework Regulations are far too vague or even silent on this crucial question. The actual determination of acceptable risk for a proposed project should flow from a social process that is explicitly described in the Framework Regulations and requires several layers of corroborations and validations with the input of the following stakeholders:[41]

> **1) the affected public and local communities including Indigenous organizations;**
> **2) governments of those affected (local, provincial/territorial, federal);**
> **3) commercial/industrial groups;**
> **4) civil society including independent experts in analyzing offshore drilling risk.**

The Framework Regulations must include a requirement that operating risks be reduced to a level that is 'as low as possible' (or ALAP). This would help circumvent the need for a subjective assessment of acceptable risk reduction inherent to the ALARP standard and would eliminate economic cost as a rationale for not reducing the likelihood of a safety risk. Only the Minister should have the authority to determine whether the incremental benefits are "clearly insufficient" to justify the incremental costs of achieving the ALAP standard.

Rationale

When assessing the risk of offshore oil and gas drilling, it is necessary to consider the possible *consequences* of an accident along with its potential *likelihood*. Risk level is typically defined by:

> **Risk = Probability of Event X Consequence of Event[42]**

While it may be true that the likelihood of a Deepwater Horizon type of blowout is small, the *consequences* of such an event would be much more devastating in the North Atlantic than

[41] The 2009 Arctic Council Guidelines recommend that government agencies, local communities and non-governmental organizations be enabled to participate in environmental management of offshore activities.
[42] Oil Spill Response Joint Industry Project. 2013. *Oil spill risk assessment and response planning for offshore installations.*
http://www.oilspillresponseproject.org/wp-content/uploads/2016/02/JIP-6-Oil-spill-risk-assessment.pdf

elsewhere due to the tremendous difficulty of ensuring adequate oil spill response in remote locations with limited infrastructure and the heightened sensitivity of the marine environment to pollution. A relatively common and non-threatening hazard found elsewhere, such as shallow gas or active faults, may pose a much greater risk in the more extreme conditions encountered in the region.

Deficient risk assessment and hazard identification were identified by Det Norske Veritas as two of the safety system management elements that can lead to a major accident in their study for the National Energy Board's Arctic Drilling Review.[43] A risk framework must distinguish among acceptable, unacceptable and tolerable risks associated with the offshore petroleum industry. Acceptable risks require no further mitigation measures; unacceptable risks are so serious that they cannot be allowed; and tolerable risks can be allowed but must be reduced to a level agreed-upon by all relevant stakeholders. This framework must encompass both the "ordinary" impacts of industrial activity, as well as the risks of very large oil spills, worst-case scenario blowouts and other unlikely but not impossible accidents. **The new Framework Regulations must therefore acknowledge that some risks are unacceptable and that continuous risk reduction is a requirement for projects and activities that are deemed tolerable.** In addition, the regulations must be based upon the highest standards of transparent governance and developed through structured, collaborative processes that establish socially-acceptable boundaries between tolerable and unacceptable risks.

'As Low As (Reasonably) Possible' (ALAP) Risk Reduction

New Framework Regulations make repeated use of the ALARP (as low as reasonably practicable) risk reduction principle when discussing safety and environmental protection measures. ALARP allows a regulator to set goals for duty-holders, rather than being prescriptive and, as such, it involves a subjective judgment weighing a risk against the trouble, time and expense needed to control it. It is not clear how ALARP will be interpreted, validated, verified and enforced in practice by the CNLOPB or whether the regulator will have the required expertise across a variety of fields to do so. The ALARP concept has intentionally not been defined in the regulations to allow for more flexibility in its interpretation and application.

In the event of an accident, the test of whether risk reduction measures were "reasonably practicable" would be determined by the courts only *after* the accident takes place. Leaving aside the fact that deciding *ex post facto* in the courts whether an operator took reasonable precautions to minimize risk does nothing to prevent an accident from occurring in the first place, courts have ruled in similar cases that they are not necessarily equipped to make determinations on issues that even experts in the field cannot agree upon. The Supreme Court has not ruled on any cases clarifying the meaning of ALARP, yet Canadian courts can rely on the English common law to guide decisions where there is no previous precedent. As such, in *Edwards v. National Coal Board (U.K.,* 1949), the court ruled that the duty holder must show there must be a "gross disproportion" between the risk reduction and the sacrifice, for it to be considered not reasonably practicable, but the court did not specify what would constitute such

[43] Det Norske Veritas. 2011. Major Hazard Incidents. Arctic Offshore Drilling Review. National Energy Board. https://apps.cer-rec.gc.ca/REGDOCS/Item/Filing/A30021

a disproportion.[44] Factors come into play such as ongoing costs set against remote chances of one-off events.

There is no reference to the ALARP standard in the General Nuclear Safety and Control Regulations under Canada's Nuclear Safety and Control *Act*, with the closest wording being the requirement to take "all reasonable precautions" to ensure safety.[45] In the case of *Energy Probe et al. v. Attorney General of Canada* (1994), the presiding judge stated that because acceptable levels of operational safety in nuclear reactors is not firmly established even amongst experts, a court is *even less equipped* to make determinations as to what factors could increase the risk of nuclear accidents.[46] Similarly, it would likely not be a simple matter for the courts to determine appropriate operational risk levels in offshore oil and gas operations in the North Atlantic, which can be highly technical and are increasingly complicated.

The decision of the Canada-Nova Scotia Offshore Petroleum Board (CNSOPB) to allow BP to keep a capping stack in Stavanger, Norway for its drilling operations in the Scotian Basin provides a useful example of the challenges inherent in using the ALARP principle in the risk assessment process.[47] The Board accepted the company's argument that the low risk of a blowout and the prohibitive cost involved made keeping the capping stack on site not a "reasonable" risk reduction measure.[48] In defending this decision, the CNSOPB stated that a blowout preventer (BOP) is already required on the wellhead and that a heavy lift vessel would be needed to deploy the capping stack, which is not typically available on the eastern seaboard but is available in Stavanger.[49] While these explanations provide some rationale for the Board's decision, they do not explain how the CNSOPB determined that requiring a capping stack on site would be a "grossly disproportionate" risk reduction measure under ALARP. At what point and by what criteria does the regulator decide that there exists a "gross disproportion" between a risk reduction measure and the additional cost to the operator? Determining ALARP is not a science and relies to a large degree on subjective reasoning. As indicated by the U.K.'s Health and Safety Executive, "Deciding whether a risk is ALARP can be challenging because it requires duty-holders to exercise judgement" and many decisions about risk and the controls that achieve ALARP are not so obvious.[50] It is up to the regulator (CNLOPB) to determine whether a company's proposed operational plan (its 'Safety Case Regime') does indeed reduce risk to the greatest (reasonable) extent possible.

For this reason, the knowledge, experience and motivations of the people who form the regulatory system are critical. Using a performance-based regulatory regime requires regulators to have broader supervisory skills and perspectives than a typical prescriptive regime. Regulators must be well trained and possess wider skill sets in order to effectively monitor and enforce safety and environmental protection.[51] As noted, a 2013 study for the National Energy

[44] https://www.xperthr.co.uk/law-reports/edwards-v-national-coal-board/49729/
[45] https://laws-lois.justice.gc.ca/eng/regulations/sor-2000-202/index.html
[46] https://www.scc-csc.ca/case-dossier/info/counsel-procureurs-eng.aspx?cas=19122
[47] http://thechronicleherald.ca/novascotia/1553818-opponents-of-ultra-deep-bp-well-of-n.s.-coast-speaking-at-smu
[48] https://www.cnsopb.ns.ca/sites/default/files/pdfs/bp_stakeholder_engagement_and_aboriginal_consultation_report.pdf
[49] https://www.cnsopb.ns.ca/media/the-facts/spill-prevention-and-response
[50] http://www.hse.gov.uk/risk/theory/alarpglance.htm
[51] PAME, 2014.

Board found that, of the 17 offshore disasters examined, 14 contained cultural causes such as tolerance of inadequate systems and resources, acceptance of substantial departures from safety policy/processes, and complacency.[52] In order to obtain the necessary trust and project support from local communities and Canadians in general, the regulator must be completely independent, representative of the broader public and have the required capability, training and legitimacy to apply credible risk assessment and management processes when evaluating project proposals. This is not currently the case.

As recommended by the Arctic Council's PAME Working Group, "Arctic countries must ensure that regulators are properly trained in techniques and practices of a performance-based regime, and that such a system is adequately funded and staffed."[53] Currently, CNLOPB regulators chair the review panels for offshore oil and gas assessments and represent a majority on these panels. This is despite the fact that the government's own expert review panel on modernizing the impact assessment process had recommended that there should be no role for offshore regulators in impact assessment.[54] The conflict of interest provisions in the CNLOPB legislation does not prevent former employees of or consultants for companies that are regulated by the CNLOP B from becoming members of the Board of Directors, the Chief Executive Officer, or Commissioners who are ultimately responsible for adjudicating the merits of a proposed project.[55]

In cases where immediate and effective oil spill response capacity does not exist or is insufficient and the consequences of an accident are severe, as in the North Atlantic, ALARP may not be an appropriate risk reduction standard. Instead, a requirement under Canadian law that operating risks be reduced to a level that is 'as low as (reasonably) possible' (or ALAP) would help circumvent the need for a subjective assessment of acceptable risk reduction inherent to the ALARP standard. Under an ALAP requirement, only the Minister would have the authority to determine whether the incremental benefits of further risk reduction measures are "grossly disproportionate" to justify the incremental costs. ALARP has a legal interpretation which implies that financial considerations must be taken into account,[56] yet the consequences of a major spill in the North Atlantic are so severe that almost everything possible, regardless of cost, should be done to reduce risk. One could easily imagine a scenario in which the risks of a blowout are deemed intolerable by local communities because the consequences would be so serious, but tolerable in the view of the regulator or project proponent. In such a case, the incremental costs of any marginal risk reduction would always be justifiable for the community regardless of cost and ALARP would not be the best risk-reduction strategy.

The ALAP standard is already required in fields such as medical device equipment, in which the ISO standard in the European Union was changed from ALARP to ALAP in 2013 in order to prohibit the use of economic cost as a rationale for not reducing the likelihood of a safety risk.[57] The same argument should be applied in the North Atlantic. Given the stakes, there can be no

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[52] Fleming, M. 2011. Importance of Safety Culture: Lessons from disasters. Presentation at the NEB roundtable Arctic drilling review. Inuvik, Canada

[53] PAME, 2014. P. 13.

[54] https://www.nrcan.gc.ca/sites/www.nrcan.gc.ca/files/pdf/NEB-Modernization-Report-EN-WebReady.pdf

[55] https://www.parl.ca/DocumentViewer/en/42-1/bill/C-69/royal-assent#ID0E2FEM

[56] https://medicaldeviceacademy.com/alarp/

[57] http://expedoc.com/B2e////index.php/alap-as-low-as-possible

justification for using cost as an excuse for not taking every necessary measure to reduce risk when effective and immediate oil spill response is in doubt. The Framework Regulations should not commit to the highest 'reasonable' safety and environmental standards or the highest standards that industry can afford.

Drawing again upon the example above, in its decision to allow BP to keep a capping stack in Norway, the CNSOPB acknowledged that the device *is* required in the Alaskan Arctic due to the remoteness of the region and the short drilling season, which significantly increases the overall risk as a capping stack may not arrive before ice could move back in at the end of the drilling season, thus exacerbating the extreme consequences associated with a major spill. An ALAP risk reduction standard would almost certainly require that a capping stack be kept nearby any offshore drilling operation, as well as a relief drilling unit, whereas the ALARP standard may not, as it would leave it up to the discretion of the regulator.

Even if ALAP is introduced, there may well be cases in which no level of risk (even if reduced to the greatest extent possible) is acceptable to local communities. It is therefore incumbent upon the government to ensure that the risks for offshore drilling projects are determined, not just by the regulator alone, but from a structured collaborative process involving impacted stakeholders and requiring the free, prior and informed consent of local Indigenous populations.[58] The actual determination of acceptable risk for a proposed project should flow from a social process that is explicitly described in the Framework Regulations and requires several layers of corroborations and validations with the input of the following stakeholders:[59]

1) the affected public and local communities including Indigenous organizations;
2) governments of those affected (local, provincial/territorial, federal);
3) commercial/industrial groups; and
4) civil society including independent experts in analyzing offshore drilling risk.

A good example of the need for a multi-stakeholder risk assessment process comes from a recent case in Australia. In 2016 BP had proposed to the Australian National Offshore Petroleum Safety and Environmental Management Authority (NOPSEMA) to drill exploratory wells in the Great Australian Bight. BP stated to the government that the company had taken sufficient measures to reduce the risks to ALARP, but an independent review of BP's proposal documentation indicated that BP's risk assessment was not correct and its proposed measures were inadequate.[60] This led to NOPSEMA requiring BP to implement further measures to develop ALARP risks, and provide the required analyses, validation and documentation of the analyses. This included additional ALARP risk management measures such as requirements for a near-drilling location capping stack and relief well drilling unit. Subsequently, BP withdrew its proposal to drill, despite it being approved initially by the Australian regulator. Regulators do not always have the required experience or expertise and do not necessarily represent the lower risk tolerance of local communities and the general public.

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[58] Bea, Robert. 'US permits Arctic drilling but questions about safety remain.' The Conversation. May 22, 2015.

[59] The 2009 Arctic Council Guidelines recommend that government agencies, local communities and non-governmental organizations be enabled to participate in environmental management of offshore activities.

[60] Bea, Robert. Submission to The Senate Standing Committees on Environment and Communications: Inquiry into Oil or Gas Production in the Great Australian Bight. October 2016.

Recommendation #3: Separate the CNLOPB responsibility to facilitate projects from safety oversight

Comment/Problem: The CNLOPB is in charge of both enabling oil recovery and value to create jobs, as well as overseeing safety and environmental issues.

Recommendation: The regulator responsibility to facilitate the carrying out of sound projects must be completely separate from its role of ensuring safety and environmental protection.

Re: Part 6 (Drilling and Production)

71 (1) The operator of a well must ensure that

- **(a)** the well is completed, tested and operated in a safe manner that allows for maximum recovery of petroleum without waste or pollution throughout the life cycle of the well;

79 An operator must, in respect of the recovery of petroleum, ensure that

- **(a)** recovery from a pool or zone is maximized in accordance with good oilfield practices;
- **(b)** wells are located and operated to provide for maximum recovery from a pool or zone; and
- **(c)** if there is reason to believe that infill drilling or implementation of an enhanced recovery plan might result in increased recovery from a pool or field, studies on those methods are conducted and submitted to the Board.

Summary

The Framework Regulations explicitly mandate operators to ensure the "maximum recovery of petroleum." This is consistent with the CNLOPB's role under the Accord Acts in ensuring economic benefits from oil and gas while also regulating the industry to ensure safety and environmental protection.[61] There are no requirements to include local stakeholder representatives on project review panels or for the CNLOPB to have any scientific expertise, such as marine biologists or climate scientists, or Indigenous representation on its Board of Directors. Investigations into previous offshore accidents have highlighted the critical importance of clearly separating under different agencies the responsibility to help enable oil production from the need to manage safety and protect the environment.[62] [63]

[61] https://laws-lois.justice.gc.ca/eng/acts/C-7.5/
[62] https://www.cbc.ca/news/canada/newfoundland-labrador/deepwater-horizon-commissioner-comparisons-to-nl-1.5253251
[63] https://www.govinfo.gov/content/pkg/GPO-OILCOMMISSION/pdf/GPO-OILCOMMISSION.pdf

Rationale

There is a public expectation that risks from offshore petroleum operations in Newfoundland and Labrador will be properly regulated and controlled, and that regulators will be free from real or perceived conflicts of interest. The stakes are too high and the potential risks too great for the best available risk assessment and management processes (sometimes known as the 'Safety Case Regime'[64]) not to be diligently applied to any proposed offshore drilling operations. In 2017, the government's own Expert Review Panel on Environmental Assessments concluded that "An authority that does not have concurrent regulatory functions can better be held to account by all interests than can entities that are focused on one industry or area and that operate under their own distinct practices."[65] Investigations into previous offshore accidents, such as the BP Deepwater Horizon disaster in 2010 and the Piper Alpha explosion in 1988, have highlighted the critical importance of clearly separating under different agencies the responsibility to help enable oil production from the need to manage safety and protect the environment.[66] [67]

Despite this, under the Framework Regulations the CNLOPB will continue in its conflicting roles to ensure economic benefits from oil and gas, as per the Accord Acts, while also regulating the industry to ensure safety and environmental protection.[68] Moreover, there is nothing preventing former employees of companies that are regulated by the CNLOPB from becoming members of project review panels. There are also no requirements to include local stakeholder representatives on the panels or for the CNLOPB to have any scientific expertise, such as marine biologists or climate scientists, or Indigenous representation on its Board of Directors.

In this context, it is understandable that some observers believe the Boards are in a perceived or real conflict of interest or even experiencing regulatory capture given their close relationship with the oil industry,[69] and and some community groups perceive that regulations are made to support oil activity rather than to promote environmental protection.[70] Representatives from the fishing industry and local communities have also expressed concern that the Board in Newfoundland-Labrador has been "partly co-opted by the petroleum industry."[71] As Chief Jean-Charles Pietacho of the Conseil des Innu told The Narwhal, "I know from experience, the decisions are already made and after that they come tell us that they are coming to consult us on a project."[72]

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[64] A safety case is a document produced by the operator of a facility that identifies the hazards and risks, describes how the risks are controlled, and describes the safety management system in place to ensure the controls are effectively and consistently applied.

[65] https://www.canada.ca/en/services/environment/conservation/assessments/environmental-reviews/environmental-assessment-processes/building-common-ground.html#_Toc002

[66] https://www.cbc.ca/news/canada/newfoundland-labrador/deepwater-horizon-commissioner-comparisons-to-nl-1.5253251

[67] https://www.govinfo.gov/content/pkg/GPO-OILCOMMISSION/pdf/GPO-OILCOMMISSION.pdf

[68] https://laws-lois.justice.gc.ca/eng/acts/C-7.5/

[69] Carter, Angela. 2020. "Fossilized : Environmental Policy in Canada's Petro-Provinces." UBC Press.

[70] Fusco, Leah. "The Invisible Movement: The Response of the Newfoundland Environmental Movement to the Offshore Oil Industry." Memorial University, 2007, p. 87-97.

[71] Shrimpton, Mark, Boris de Jonge, Lucia McIsaac, and Sean Cadigan. "Atlantic Canada Offshore Petroleum Exploration Rights Permitting Study." St. John's: Atlantic Canada Petroleum Institute, 2003, p. 20.

[72] https://thenarwhal.ca/newfoundland-oil-gas-federal-oversight/

While there is no doubt that oil companies and Canadian regulators take safety very seriously, the industry is attempting increasingly technically ambitious operations and companies are expanding their operations to new, often environmentally sensitive areas, where a significant amount of exploration drilling may be required, which entails the highest risk of blowout.[73] Moreover, tolerable levels of risk for government regulators and companies may not align with those of potentially impacted local communities. Whether the Boards are well-suited to their role as the lead regulator on offshore environmental matters is an essential and pressing question that is not reflected in the Framework Regulations, despite the fact that it is the regulators who will be interpreting and enforcing increasingly performance-based concepts such as ALARP found within these regulations.

Recommendation #4: Remove liability limits for offshore operators

Comment/Problem: The current design of Canada's liability rules for offshore oil operations potentially leaves governments, taxpayers, and communities vulnerable to clean up costs above $1 billion in the event of a significant accident or spill.

Recommendation: Unlimited financial and environmental liability, even in the case of unforeseeable events, would help to ensure that companies take every necessary precaution to prevent accidents from occurring and is consistent with the 'polluter pays' principle. Operators must also be able to prove to the regulator that they have the financial capacity to pay for the full amount of clean-up costs and all associated damages.

Re: Administrative Monetary Penalties Regulations

Overview

The proposed annexed regulations amending the Administrative Monetary Penalty Regulations under the Accord Acts provide the CNLOPB with the authority to issue fines to regulated operators for enforcement purposes. These penalties, established under the 2014 *Energy Safety and Security Act*, are set at $1 billion in absolute liability (no fault). Other countries do not have caps on liability, regardless of fault, yet this has not discouraged interest or investment in offshore drilling. $1 billion in absolute liability is too low to cover the costs associated with catastrophic spills especially in the North Atlantic where environmental conditions would frustrate spill response efforts.

Rationale

In February 2016, amendments to the Administrative Monetary Penalty Regulations under the Accord Acts, came into force, which provided the CNLOPB with the authority to issue administrative monetary penalties (AMPs) to regulated operators for enforcement purposes.

[73] https://officerofthewatch.com/2013/08/06/the-probability-of-an-offshore-accident/

The 2014 *Energy Safety and Security Act* (ESSA) introduced changes to the liability regimes governing Canada's offshore oil and gas industries. These changes increased the amount of security required to be provided to $100 million, raising the cap on absolute, or no-fault, liability from $30 million to $1 billion and empowering offshore regulators to issue administrative monetary penalties. This allows regulators to determine the amount of security, with no set minimum, that an operator will be required to post in order to undertake exploration activities. The amendments set a minimum $100 million of security, which the CNLOPB may exceed at its discretion. However, regulators must appeal to the courts in order to impose fines and penalties on parties that contravene the statutes and regulations.

The current design of Canada's liability rules for offshore oil operations potentially leaves governments, taxpayers, communities and the environment vulnerable in the event of a significant accident or spill. Absolute liability ("without proof of fault or negligence") is capped at $1 billion CAD; however, liability is unlimited when operator negligence is proven. In line with the polluter pays principle, liability should be commensurate with the entire potential costs of a catastrophic accident, regardless of fault. This principle, as it has been defined by the Supreme Court of Canada, "assigns polluters the responsibility for remedying contamination for which they are responsible and imposes on them the direct and immediate costs of pollution."[74] This principle is encouraged in Principle 16 of the 1992 Rio Declaration, which Canada signed, and the 2009 Arctic Council Guidelines.[75]

The liability regime for drilling operations conducted in the Newfoundland and Labrador offshore is established pursuant to the *Offshore Area Oil and Gas Operations Regulations*[76] (to be repealed and replaced), the *Offshore Petroleum Administrative Monetary Penalties Regulations*[77] and the *Offshore Petroleum Cost Recovery Regulations*.[78] Liability limits not only shape and limit any claims for post-spill compensation, but they can also create an incentive for oil companies to pursue excessively risky activities, knowing they will only bear the full cost of liability (beyond the absolute liability cap) if fault or negligence is established and upheld in court. Essentially, they are a form of public subsidy to the oil industry, since potential costs above the limit need not be factored into insurance costs, and therefore do not necessarily figure in assessments of the economic viability of a potential project. An appropriate liability regime can decrease the risk of environmental harm by rewarding improved industry safety practices.

If a possible hazard has been identified and ignored, or if insufficient precautions were taken, the operator would certainly be considered negligent and liability would be absolute. However, oil and gas drilling operations in extreme and unpredictable environments such as the North Atlantic can encounter many potential events and hazards, some of which may be considered reasonably "foreseeable" by the courts, while others may not. If a serious accident were to take place as the result of a *force majeure* (chance occurrence or unavoidable accident), it is conceivable that the government (i.e., taxpayers) would be liable for clean-up costs above $1 billion as per the existing liability rules.

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[74] Imperial Oil Ltd v Quebec (Minister of the Environment), 2003 SCC 58 at para 24, [2003] 2 SCR 624 [Imperial Oil].
[75] United Nations. 1992. Rio Declaration on Environment and Development. https://www.jus.uio.no/lm/environmental.development.rio.declaration.1992/portrait.a4.pdf
[76] https://assembly.nl.ca/Legislation/sr/Regulations/rc960001.htm
[77] https://assembly.nl.ca/Legislation/sr/Regulations/rc160005.htm
[78] https://assembly.nl.ca/Legislation/sr/Regulations/rc160006.htm

At first glance, $1 billion appears to be a large sum, particularly in light of the previous $40 million limit.[79] However, the 2010 Deepwater Horizon blowout in the Gulf of Mexico is reported to have cost $62 billion in damages, and some studies have estimated the actual cost at $145 billion.[80] It is quite likely that a major spill in the extreme and remote Atlantic offshore environment would be almost impossible to clean up, with potentially devastating impacts on the marine environment and the livelihoods of local communities. The burden of proof would be on the Canadian government, Indigenous organizations or individuals and small communities with limited financial means to prove that an oil company was at fault for accidents exceeding $1 billion in clean-up costs and damages.

If the liability legislation was intended to enforce the polluter pays principle, then liability caps run contrary to this, given that major spills could cost far more than $1 billion. At the time of its introduction, the government argued that the cap was intended to protect companies and even their insurers from going bankrupt. It was further argued that liability beyond this amount would be limited by bankruptcy legislation in any event, thus the cap is necessary to protect jobs in both oil and gas operators and insurers themselves. Therefore, under Canada's Financial Responsibility Requirements, an operator is not required to provide proof that has a minimum of $1 billion in assets and has the financial resources to pay for the entire amount of at-fault liability above this amount.

This is an obvious weakness in the legislation. A regulator should be able to assess, before issuing a work permit, whether a company has the financial means to cover all the potential clean-up, damages and liability costs of a worst-case scenario incident. This would ensure that a potential polluter has the ability to pay for any and all potential damages. Even under Canada's current liability cap, a company would still be held fully liable without limit if negligence is proven in court. If a company does not have the financial means, it should not be operating in the high-risk Atlantic offshore environment, period. [81]

Other countries do not have caps on liability, regardless of fault, yet this has not discouraged interest or investment in offshore drilling. In Norway, operators are liable for all pollution damages, although liability can be reduced at the discretion of the government.[82] The U.K., Russia and Greenland also utilize unlimited liability for offshore oil and gas operators, meaning there is no cap on liability for offshore drilling and the operator is liable for pollution damage without regard to fault.

The Energy Safety and Security *Act* included a number of fundamental weaknesses that have not been addressed in the Framework Regulations and compromise the *Act*'s effectiveness in terms of improving safety practices and protecting Canadian taxpayers in the event of a catastrophic spill:

1. $1 billion in absolute liability is too low to cover the costs associated with catastrophic spills especially in the North Atlantic where environmental conditions would frustrate spill response efforts;

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

[80] Lee, Y. G., Garza-Gomez, X., & Lee, R. M. (2018). Ultimate Costs of the Disaster: Seven Years After the Deepwater Horizon Oil Spill. *Journal of Corporate Accounting & Finance*, *29*(1), 69–79. https://doi.org/10.1002/jcaf.22306

[81] The Arctic Council (2009) recommends that operators "demonstrate financial capacity to carry out all aspects of the operation, including responding to environmental emergencies and decommissioning of facilities."

[82] Norwegian Petroleum Act, section 7(3).

2. The bill provides for ministerial discretion to reduce absolute liability levels to below the legislated level of $1 billion;

3. The bill provides relief from liability, in certain cases, for the effects of dumping toxic spill treating agents (chemical dispersants) into marine environments;

4. The bill does not require an operator to provide proof that it has the financial resources to pay for the entire amount of at-fault liability.

Eliminating the $1 billion liability cap and ensuring that operators have the financial capacity to pay the full amount of clean-up costs and damages are two major reforms that will go a long way toward ensuring that companies weigh the full potential liability and make better risk decisions. Removing the cap, as other countries have done, would transfer the respective liabilities to those companies that wish to operate in the offshore. Unlimited absolute liability will ensure the appropriate allocation of risk, which will provide an incentive for industry to improve safety practices, thereby reducing the likelihood of polluting accidents; and it will ensure that taxpayers are entirely protected from the financial consequences of an offshore oil spill, which could run into the tens of billions of dollars.

Financial Responsibility

Smaller oil companies may have trouble even paying the $1 billion absolute liability, let alone if there was no absolute liability cap and they were responsible for all the clean-up costs. All countries require some demonstration, to varying degrees, of the operator's ability to take financial responsibility and/or demonstrate reserves, such as sufficient insurance, in the event of an oil spill; however, as noted there is no legal requirement in Canada for operators to demonstrate financial capacity or insurance to cover liabilities up to a realistic level.

Greenland has been showing some leadership on this issue, demanding that oil companies provide a $2 billion guarantee in advance of exploratory drilling. Smaller companies are required to provide the money up front, with the "bond" being designated specifically for meeting the cleanup costs resulting from any spill.[83] The licensee must provide a financial guarantee of $10 billion USD, which is an improvement upon Canada's absolute liability cap but still insufficient. In the U.K., in order to be satisfied that an operator is in a position to implement its plan, the Department of Energy and Climate Change must also be satisfied that the operator (together with its partners) has appropriately estimated the possible costs of implementing these steps and has in place the funds to do so.[84]

[83] Tim Webb, "Greenland wants $2bn bond from oil firms keen to drill in its Arctic waters," The Guardian, 12 November 2010, available at http://www.guardian.co.uk/business/2010/nov/12/greenland-oil-drilling-bond

[84] U.K. Department of Energy and Climate Change, Oil Pollution Emergency Plan Requirements, 2009, https://www.og.decc.gov.uk/environment/OPEP_Guidance.doc

Recommendation #5: Include climate risk analysis in the impact assessment process

Comment/Problem: Decisions about whether to allow offshore oil and gas activities can be made without accounting for the climate crisis, the urgent need to transition to renewable sources of energy or a holistic view of activities happening in Canada's oceans.

Recommendation: The Framework Regulations should include a climate test to ensure that oil and gas production is consistent with national and global climate goals.

Re: Part 6

Drilling and Production

Capture or venting of emissions

83(2) *The operator must ensure that the emissions of gas from the seals of a centrifugal compressor or reciprocating compressor at an installation are*

- ***(a)*** *captured and routed to gas conservation equipment or gas destruction equipment; or*
- ***(b)*** *routed to vents that release those emissions into the atmosphere.*

Measure of flow rate of emissions

(3) *The operator must ensure that the flow rate of emissions of gas released from vents referred to in paragraph (2)(b) is measured by means of a continuous monitoring device.*

Summary

The Framework Regulations only consider emissions of gas and continue to allow the CNLOPB to make decisions about whether and under what conditions offshore oil and gas activities can be carried out without accounting for climate change and the widely accepted need to reduce greenhouse gas emissions. The regulator is not obligated to recommend the rejection of a project that is inconsistent with national or provincial climate commitments or has an inadequate strategy to minimize or eliminate greenhouse gas emissions.

Rationale

Currently, although climate change is included as one of the primary factors that must be considered when the IAAC makes a decision on whether to approve a project, there is no "climate test" in Canadian legislation to ensure that development is compatible with national and international climate targets, both in terms of upstream emissions (oil extraction and production) as well as downstream (burning of the oil and gas by end users). Decisions about

whether and under what conditions to allow offshore oil and gas activities can be made without fully accounting for compatibility with climate targets and the urgent need to transition to renewable sources of energy. The regulator is not obligated to recommend the rejection of a project that is inconsistent with climate commitments.[85] What's more, there is no trigger to ensure projects receive an impact assessment based on climate impacts and no requirement to consider the "downstream" climate impacts of a project when the oil is ultimately burned, which by some estimates would increase upstream emissions from production by up to ten times.[86] [87]

The world's energy transition is driven by the global consensus that to avoid disaster, the Earth's overall rise in temperature must be no more than 2°C, according to the Paris Agreement, with a safer aspirational target of 1.5°C.[88] However, carbon emissions from the full production of currently operating oil and gas fields and coal mines across the world will almost certainly lead to global temperature rise beyond 2°C. To stay within this target, studies indicate that 68-80 percent of existing global fossil fuel reserves must stay in the ground.[89]

Development of undiscovered and expensive oil and gas resources in the North Atlantic is very likely not commensurate with the 2°C goal, let alone the 1.5°C target.[90] To the extent that nations choose not to abide by this commitment, the outcome for the world will be devastating.[91]

In 2019, the government of Canada released Physical Activities Regulations in support of the new Impact Assessment *Act*. As noted, these regulations do not require a "climate test" as part of the impact assessment process. In other words, despite the apparent incompatibility of North Atlantic oil with global climate targets and the government's stated commitment to ensure that oil and gas activities must be consistent with national and global climate goals, an emissions assessment of proposed offshore projects is not required by law. Climate is also not one of the factors used to determine whether a project will cause significant environmental effects. In contrast, Greenland's Mineral Resources Act sets out specific rules regarding environmental protection and liability. Pursuant to section 56, the Greenland Government must attach importance to, for example, the consideration for avoiding impairment or any other negative impact on the climate when it makes a decision on the granting of a licence under the *MRA*.

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[85] https://y2y.net/publications/science-in-the-iaa-tech-report-report-card.pdf/

[86] Climate Accountability Institute. 2017. The Carbon Majors Database: CDP Carbon Majors Report 2017.

[87] Lee, M. 2017. Extracted Carbon: Re-examining Canada's Contribution to Climate Change through Fossil Fuel Exports. *Canadian Centre for Policy Alternatives*, p.5. https://www.policyalternatives.ca/publications/reports/extracted-carbon

[88] United Nations Climate Change. The Paris Agreement. https://unfccc.int/process-and-meetings/the-paris-agreement/the-paris-agreement

[89] See Carbon Tracker Initiative. 2011. Unburnable Carbon – Are the world's financial markets carrying a carbon bubble? https://www.carbontracker.org/reports/carbon-bubble/; M. Raupach et al. 2014. Sharing a quota on cumulative carbon emissions. *Nature Climate Change* 873; Oil Change International. Sept. 2016. The Sky's Limit: Why the Paris Climate Goals Require A Managed Decline of Fossil Fuel Production. (http://priceofoil.org/2016/09/22/the-skys-limit-report/

[90] McGlade, C. and Ekins, P. 2015. The geographical distribution of fossil fuels unused when limiting global warming to 2° C, 517 Nature 187.

[91] Intergovernmental Panel on Climate Change. 2018. Global Warming of 1.5 °C: Special Report on the impacts of global warming of 1.5 °C above pre-industrial levels and related global greenhouse gas emission pathways, in the context of strengthening the global response to the threat of climate change, sustainable development, and efforts to eradicate poverty. http://www.ipcc.ch/report/sr15/

Canada has no such requirements. In fact, following the Regional Assessment of Offshore Oil and Gas Exploratory Drilling East of Newfoundland and Labrador, many offshore exploration projects in the region will now be exempt from any evaluation of potential environmental impacts, including climate impacts.

GHG emissions from a single, average offshore platform are estimated by Environment and Climate Change Canada to be roughly one-half megatonne (500,000 tonnes) per year in the Atlantic offshore,[92] which is roughly equivalent to putting an additional 100,000 passenger vehicles on Canadian roads.[93] Again, this does not include downstream emissions when the extracted oil and gas is burned, which increases the total carbon footprint by up to 1000%.[94] [95]

Reducing greenhouse gas emissions and achieving carbon neutrality by 2050 will require a fundamental change in the manner in which Canada and the global community develops and uses energy. Full consideration of whether, and under what circumstances, the federal government allows the extraction and burning of offshore oil and gas must be part of that change.

Recommendation #6: Prohibit oil and gas in ecologically or culturally significant areas.

Comment/Problem: The Framework Regulations do not prevent drilling or seismic testing in ecologically and biologically significant areas, nor in high-risk or culturally important areas.

Recommendation: In keeping with the Precautionary Principle and with the express consent of Indigenous rights holders, areas identified as high-risk, ecologically and biologically significant, or culturally important must be placed off-limits to oil and gas activities. This includes sensitive benthic areas, Marine Protected Areas, marine refuges and critical habitat for species at risk.

Summary

The Framework Regulations include no mention of drilling in ecologically or culturally sensitive areas. There are no requirements for operators to avoid these areas. WWF-Canada requests again that the Framework Regulations prohibit oil

[92] ECCC GHGRP. 2018. *Greenhouse Gas Reporting Program.* Environment and Climate Change Canada. Available at: https://climate-change.canada.ca/facility-emissions/, version 1.0.6656.24545
[93] U.S. Environmental Protection Agency. Greenhouse Gas Equivalencies Calculator. https://www.epa.gov/energy/greenhouse-gas-equivalencies-calculator
[94] Climate Accountability Institute. July 2017. The Carbon Majors Database: CDP Carbon Majors Report 2017. https://b8f65cb373b1b7b15feb-c70d8ead6ced550b4d987d7c03fcdd1d.ssl.cf3.rackcdn.com/cms/reports/documents/000/002/327/original/Carbon-Majors-Report-2017.pdf?1499691240
[95] U.S. Environmental Protection Agency. Greenhouse Gas Equivalencies Calculator. https://www.epa.gov/energy/greenhouse-gas-equivalencies-calculator

and gas activities within protected areas and other areas that aim to protect important benthic habitats, conserve biodiversity and uphold Canada's commitments to marine conservation under the North Atlantic Fisheries Organization (NAFO).

Rationale

The North Atlantic has sensitive and unique ecosystems that are vulnerable to disturbance and are not well-studied, and some communities are dependent on a healthy marine environment for their subsistence, as well as their social, spiritual and cultural well-being. Ecologically and biologically significant areas (EBSAs) are regions within Canada's oceans that have been identified through formal scientific assessments as having special biological or ecological significance. Identification of EBSAs is based on the biological and ecological properties of an area and does not consider threats and risks to those sites; however, due to their importance, they are managed with a greater degree of risk aversion.[96]

The challenges associated with drilling in the North Atlantic - extreme weather, limited visibility, sea ice, significant geographic distances, and limited environmental response equipment – mean that the industry may be attempting increasingly technically ambitious operations, usually in deep water, with extremely limited response capacity in difficult conditions. A significant amount of seismic airgun surveys and exploration drilling may be required, which is the drilling phase that entails the highest risk of blowout.[97]

Given the potentially catastrophic consequences associated with a major spill, areas identified as high risk (e.g. presence of summer sea ice, extreme weather conditions, deep water) or as having significant ecological, biological or cultural importance must be excluded from seismic airgun surveys and offshore exploration or production activities, without the express consent of Indigenous rights holders. [98] This includes EBSAs, sensitive benthic areas, Marine Protected Areas, marine refuges and critical habitat for species at risk, as identified under Canada's Species at Risk *Act*.[99]

[96] Department of Fisheries and Oceans Canada. 2004. Identification of Ecologically and Biologically Significant Areas. DFO Can. Sci. Advis. Sec. Ecosystem Status Rep. 2004/006.
[97] https://officerofthewatch.com/2013/08/06/the-probability-of-an-offshore-accident/
[98] Weilgart, L. 2019. Best Available Technology and Best Environmental Practice for Three Noise Sources: Shipping, Seismic Airgun Surveys and Pile Driving. The Journal of Ocean Technology. Vol. 14, No. 3. 1-9.
[99] https://laws-lois.justice.gc.ca/eng/acts/s-15.3/

Recommendation #7: Strengthen evidence-based rules for seismic testing programs

Comment/Problem: The Framework Regulations are insufficient to ensure the safety of marine wildlife when conducting underwater seismic blasting operations and they are not consistent with the current state of scientific knowledge of the impacts of underwater noise.

Recommendation: Strengthen evidence-based rules for seismic programs and require "best available and safest technology" (BAST) alternatives that are less harmful to marine wildlife. More research is needed on the effects of seismic airgun noise on marine mammals and on the abundance and distribution of marine wildlife.

Re: Part 5 (Geoscientific Programs, Geotechnical Programs and Environmental Programs)

> **49** **(a)** all equipment and materials that are necessary to conduct a geoscientific program, geotechnical program or environmental program are handled, installed, inspected, tested, maintained and operated taking into account the manufacturer's instructions and industry standards and best practices;

Summary

In place of "best practices", the Framework Regulations should explicitly require the use of the "Best Available and Safest Technologies" (BAST) in part 5 of the Framework Regulations regarding the use of seismic programs. Much of the prescriptive language pertaining to equipment for geophysical testing (i.e., seismic programs) has been removed in favour of an overreliance on performance-based standards that require equipment simply to be "maintained and operated taking into account the manufacturer's instructions." While the importance of diver safety is mentioned, there is no mention of the safety of marine wildlife and the risks that seismic testing programs can pose to the marine environment. A BAST requirement would not prescribe the use of specific technologies but would require that safer alternatives be used whenever possible.

Rationale

Significant gaps in knowledge exist regarding the effects of seismic air gun noise on marine mammals,[100] and we do not yet have sufficient information on the abundance and distribution of some marine wildlife in the North Atlantic region.[101] Baseline studies of biological abundance and distribution must occur at least a year, preferably two, in advance of any seismic surveys, as

[100] Gordon et al. 2003.
[101] Weilgart, 2019.

we have a legitimate reason to expect negative impacts severe enough to impact the health, welfare, and sustainability of at least some animal populations, from plankton through fish to whales.

The most effective mitigation measures for seismic air gun surveys are:

- remove the surveys from areas/seasons rich in marine life and sensitive species
- lower the source level (quiet the noise)
- require the use of air gun alternatives such as Marine vibroseis (MV), which can drastically cut noise levels and limit the frequencies (pitches) of noise output.

The Statement of Canadian Practice with respect to the Mitigation of Seismic Sound in the Marine Environment specifies the mitigation requirements that must be met during the planning and conduct of marine seismic surveys.[102] The *Statement* applies to all seismic activities in the marine environment that use air source arrays. For seismic surveys conducted for the purpose of oil and gas exploration, the *Statement* is administered by the existing oil and gas regulatory bodies (i.e., the CNLOPB in this case).

Unfortunately, the provisions in the *Statement* are insufficient to ensure the safety of marine wildlife when conducting underwater seismic blasting operations. Moreover, part 5 of the Framework Regulations places far too much emphasis on performance-based standards in regulating geophysical activities when scientifically proven minimum standards and the precautionary approach would be much more effective in protecting the marine environment from excessive underwater noise.

Underwater noise from vessel traffic can readily propagate over 100 kilometers and the noise from seismic surveys can be heard almost continuously in some areas for distances of up to 4,000 km as seismic air gun surveys are among the loudest of human produced sounds, and sound travels very fast and efficiently in water.[103] Although there is a general dearth of noise impact studies from the North Atlantic region, the science to date clearly suggests that there can be serious negative effects from seismic testing on some important species, including plankton, benthic organisms, whales, harbour porpoises, dolphins, invertebrates including squid, and fish. These impacts can linger for months or even a year after the surveys have ceased. To date, roughly 130 species have been documented to be impacted by human-caused underwater noise pollution,[104] and while more research is needed, we know enough from studies so far, especially those involving seismic air gun surveys, to conclude that anthropogenic underwater noise is a serious and transboundary pollutant, which can degrade huge ocean areas and do harm to marine ecosystems.

A 2015 report by Marine Conservation Research on the impacts of seismic testing on whales concluded that "It is indisputable that seismic noise has adverse impacts on marine life…From the research at hand, it is clear that noise from seismic activity impacts whales. It can damage their hearing, ability to communicate, disrupt diving behavior, feeding and migration patterns.

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[102] https://waves-vagues.dfo-mpo.gc.ca/Library/363838.pdf

[103] Nieukirk, S. L., Mellinger, D. K., Moore, S. E., et al. (2012). Sounds from airguns and fin whales recorded in the mid-Atlantic Ocean, 1999–2009. Journal of the Acoustical Society of America, 131, 1102–12.

[104] Weilgart, L., 2018. *The impact of ocean noise pollution on fish and invertebrates*. Report for OceanCare, Switzerland.

There are increasing indications that this could cause serious injury to whales. It may also disrupt reproductive success and increase the risk of strandings and ice entrapments."[105] Notably, the report also concluded that there is a massive research gap in this field and that decision-makers should use "extreme caution" before allowing seismic activity.

As Weilgart (2018) summarized, for some species and in certain situations, the weaker the behavioural response, the more serious the impact on the population.[106] Individuals with lower energy reserves or no alternative habitat cannot afford to flee repeatedly from disturbance but are forced to remain and continue feeding, apparently unresponsive to disruption.[107] [108] Yet these individuals are in fact more vulnerable to disturbance. Animals do not always react in an outwardly observable or obvious manner even if they are seriously impacted.[109]

There are known, safer alternatives to seismic testing such as MV, which must be encouraged or required whenever possible.[110] Penetration into the seafloor is largely a function of sound frequency, and MV can produce the same well-penetrating, low frequencies as airguns and send sound waves just as deeply into the seafloor as airguns.[111] Moreover, MV is a controlled source and as such, the source characteristics (frequency, duration, type of sound) can be altered in real-time, to optimize the output for each environment and situation. This technology is less environmentally impactful, as the unnecessary high frequencies that airguns emit (up to 100,000 Hz), are not used by MV. Frequencies over about 150 Hz are not recorded or used by the oil and gas industry. Thus, a great deal of energy is emitted by airguns that is wasted. The high frequencies that airguns emit can unnecessarily disturb species such as narwhals, belugas, northern bottlenose whales, and harbour porpoises. MV is much quieter, both near the source and at distance.[112] Researchers have estimated that a MV survey would expose only about 1-20% of whales and dolphins to high noise levels when compared to those exposed to an airgun survey, based on their models.[113] MV is roughly one-thousand times quieter than traditional seismic airguns and does not have a "shot-like" quality, something that is particularly injurious to living tissues.

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[105] https://www.greenpeace.org/usa/wp-content/uploads/2015/08/A-Review-of-the-Impact-of-Seismic-Survey-Noise-on-Narwhal-and-other-Arctic-Cetaceans-.pdf

[106] Weilgart, 2018.

[107] Gill, J.A. et al. 2001. Why behavioural responses may not reflect the population consequences of human disturbance. *Biological Conservation* 97 (2001) 265-268. http://citeseerx.ist.psu.edu/viewdoc/download?doi=10.1.1.546.453&rep=rep1&type=pdf

[108] Stillman, R.A. & Goss-Custard, J.D. 2002. Seasonal changes in the response of Oystercatchers Haematopus ostralegus to human disturbance. *J. Avian Biol*. 33: 358–365. http://obpa-nc.org/DOI-AdminRecord/0064594-0064602.pdf

[109] Bejder, L. et al. 2006. Decline in relative abundance of bottlenose dolphins exposed to long-term disturbance. Conservation Biology. 20(6). 1791-98.

[110] Weilgart, L. (2016). Alternative Quieting Technology to Seismic Airguns for Oil and Gas Exploration and Geophysical Research. Brief for GSDR – 2016 Update.

[111] Ibid.

[112] Duncan, A.J., Weilgart, L.S., Leaper, R., Jasny, M. and Livermore, S., 2017. A modelling comparison between received sound levels produced by a marine Vibroseis array and those from an airgun array for some typical seismic survey scenarios. *Marine Pollution Bulletin*, *119*(1), pp.277-288.

[113] LGL & MAI. 2011. Environmental Assessment of Marine Vibroseis. LGL Rep. TA4604-1; JIP contract 22 07-12. Rep. from LGL Ltd., environ. res. assoc., King City, Ont., Canada, and Marine Acoustics Inc., Arlington, VA, U.S.A., for Joint Industry Programme, E&P Sound and Marine Life, Intern. Assoc. of Oil & Gas Producers, London, U.K. 207 p.

The mitigation options that currently exist to minimize seismic impacts are largely unproven in their effectiveness. For instance, ramp-ups or soft starts, where the number of air guns firing are gradually and audibly increased, do not appear to be consistently and reliably effective in causing humpback whales to move away from the source vessel.[114] There is large variation in whale behavior, with some groups swimming away from the sound source whereas others approached even relatively loud noise levels, possibly viewing them as a challenge that needed to be confronted. Whales that did avoid the (source) vessel emitting air gun noise may have avoided the vessel itself, not the noise.[115] Although the sound source was different (naval sonar vs. seismic air guns), and the ramp-up procedures are different, gradually increasing the sonar source intensity has been found not to be an effective method to reduce the risk of physiological effects for humpback whales overall, mainly because most whales did not exhibit very strong avoidance responses to the sonar signals.[116] Animals that had not been exposed to sonar recently, were not feeding, or were with a small calf were more responsive. This again illustrates how difficult it is to form conclusions about innocuous noise impacts since whales, but also fish, show great variation in their behavior in the wild. Moreover, when animals have a strong motivation not to move away from their current location, ramp-ups are unlikely to be effective.

"Shut down zones" when a marine mammal is sighted is also a problematic mitigation measure. Ensuring operator compliance with a "shut down zone" rule is not straightforward and research suggests that the required 500-metre radius in the Statement of Canadian Practice with respect to the Mitigation of Seismic Sound is insufficiently small to adequately protect marine mammals from seismic impacts. There is no consensus regarding what constitutes a "safe" exposure as the safety radius is highly dependent on the sound transmission conditions which change with bathymetry, nature of the seafloor, and the sound speed profile which can change between seasons. Impacts from air guns also can vary based on past exposure, recovery time, species, age and sex, as well as context.[117]

Even if it were possible to determine a safe 'shut down zone' radius, it can be extremely difficult for marine mammal observers on board seismic vessels to detect marine wildlife within that zone. Survey activities often take place at night or in other limited-visibility conditions and many marine mammals and turtles are hard to sight as they are cryptic, elusive and often underwater.[118] Most whales are rarely visible at the surface, especially the deep divers (Northern bottlenose whales) and especially in anything but perfect visibility. Quantitative analysis has shown that mitigation monitoring detects fewer than 2% of beaked whales (e.g. Northern bottlenose whales) even if the animals are directly in the path of the ship.[119] Other species might be slightly easier to sight, but monitoring cannot be relied upon to be satisfactorily effective.

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[114] Dunlop, R.A. et al. 2017. Response of humpback whales to ramp-up of a small experimental airgun array. *Marine Pollution Bulletin*. 103: 1-2.

[115] Ibid.

[116] Wensveen et al. 2017. Lack of behavioural responses of humpback whales indicate limited effectiveness of sonar mitigation. Journal of Experimental Biology. 220(22): 4150-4161.

[117] Gordon, J. et al. 2003. A Review of the Effects of Seismic Surveys on Marine Mammals. *Marine Technology Society Journal.* 37(4): 16-34

[118] Weilgart, 2019.

[119] Barlow, J. and Gisiner, R. 2006. Mitigating, monitoring and assessing the effects of anthropogenic sound on beaked whales. *Journal of Cetacean Research and Management*, *7*(3), pp.239-249.

The most effective mitigation measure for seismic air guns is simply to prohibit their use, particularly when safer alternatives are known to exist. At a minimum, air gun surveys should be separated from areas rich in marine life and sensitive species, and the source level should be lowered (i.e., quiet the noise), but these measures are not currently required under the Framework Regulations.

The long-term impacts of seismic testing, together with threats such as climate change and ocean acidification, on the ecosystem and population biology should be thoroughly studied. Such studies are very challenging to carry out, but the burden of proof (to show no harm) should be on the project proponent, who wishes to alter the environment, rather than those wishing to preserve it. In the meantime, Canadian regulations must require the use of alternatives to air guns whenever possible, such as MV, which are proven to be less harmful to marine wildlife. Seismic air gun surveys clearly degrade the marine environment and impact the health of many species' populations, which northern communities depend upon for their survival, culture and livelihoods. These surveys need to be regulated accordingly.

Recommendation #8: Vastly improve oil spill response capacity

Current situation: There are no requirements to ensure that a major oil spill could be cleaned up quickly and effectively.

Recommendation: The Framework Regulations must ensure effective and efficient oil response capacity. Immediate steps, including substantial investment, must be taken to provide adequate response capabilities and infrastructure support.

Re: Part 2

Contingency plan

12 (1) An operator must develop a contingency plan that sets out the procedures (including emergency response procedures), practices, resources and monitoring measures that are necessary to effectively prepare for and mitigate the effects of any accidental event.

12 (4) If a spill-treating agent is being considered for use as a spill response measure, the contingency plan must include the following additional documents and information:

> *(a) the name of the chosen spill-treating agent and an assessment of its efficacy in treating the potential sources of pollutants, including the results of any tests conducted for the assessment and a description of those tests;*
>
> *(b) the results of an analysis that demonstrates that a net environmental benefit is likely to be achieved through the use of the spill-treating agent under certain circumstances;*
>
> *(c) a description of the circumstances under which the spill-treating agent will be used and the estimated period within which the use of that spill-treating agent will be effective;*
>
> *(d) a description of the methods and protocols, including the amount and application rate, for safe, effective and efficient use of the spill-treating agent;*

(e) the international standard or alternative recognized by the Board on which the spill-treating agent assessment, analysis and the methods and protocols referred to in paragraphs (a) and (b) are based, taking the local environment into account;

(f) a list of the personnel, equipment and materials that an operator will have available for the use of the spill-treating agent in spill response operations and the details of any contractual arrangements for that personnel and equipment and those materials; and

(g) a monitoring plan for the use of the spill-treating agent.

Summary

Once again, rather than requiring only that the operator "set out" emergency response procedures and that the spill treating agent be named, the Framework Regulations should explicitly require the use of the 'Best Available and Safest Technologies' to help ensure that a major spill could be cleaned up and that the safest, most effective spill treating agent be used based on regional conditions and the best available science. The industry's agent of choice, Corexit, can be toxic, sometimes more so than oil, and cold weather and the presence of ice can make it difficult to apply.

Rationale

It is likely that a major spill in the North Atlantic would have potentially devastating impacts to the marine environment and to communities in the region, who depend on healthy and clean marine waters. There are no actual legal requirements in Canada to ensure that sufficient people and equipment could respond to a spill from a drilling rig or a ship, nor any obligations to ensure that such a response would occur within the time frame required by law.

Oil spill response in the region is challenging because of extreme weather, sea ice and environmental conditions, periods of prolonged darkness, and significant geographic distances. Remote locations mean response times for large-scale cleanup can be much longer than in temperate latitudes. Rain, blowing snow, fog, gale-force winds and prolonged periods of darkness limit visibility. A 2016 report by Nuka Research entitled '*Estimating an Oil Spill Response Gap for the U.S. Arctic Ocean'* shows that oil controlling booms start to lose their effectiveness in metre-high waves and stop working entirely when the waves reach two metres high.[120] Simply put, there is currently no method that has been proven effective and reliable in dealing with major oil spills in the extreme environmental conditions common to the North Atlantic.

Oil Spill Dispersants

There are regulations in Canada that control the type and use of oil spill dispersants. They require an authorization from the CNLOPB once a Spill Impact Mitigation Assessment (SIMA) has been conducted to determine if they should be used. The application of chemical dispersants

[120] http://nukaresearch.com/download/projects/estimating-an-oil-spill-response-gap-for-the-us-arctic-ocean-revised.pdf

such as Corexit can be toxic, sometimes more so than oil, and cold weather and the presence of ice can make it difficult to apply dispersants to oil slicks, as dispersants rely on ocean waves to mix the oil and chemicals together. As one of several response techniques, the use of chemical dispersants may be necessary in certain circumstances, however, their use must be a last resort, produce a net environmental benefit and must be constrained by socioeconomic and environmental considerations.

The environmental rationale for attempting to chemically disperse spilled oil is that removing the oil from the water surface and driving it into the water column as suspended droplets could prevent damage to shorelines, seabirds and marine mammals. The practical problem with this idea is that it can only work if a very high fraction of the oil can be driven into the water column. Otherwise, enough oil will remain on the surface to contaminate shorelines in spite of the dispersant application. It should also be noted that there are trade-offs involved in moving oil from the surface to the water column.

The potential ecological consequences of the physical and toxicological properties of dispersed oil are far from fully understood. One recent study found that, given the potential for toxic chemical dispersants to cause environmental damage by increasing oil bioavailability and toxicity while suppressing its biodegradation, unrestricted dispersant application in response to deep-sea blowouts is highly questionable and more research is required to inform response plans in future oil spills.[121] What is clear, however, is that broadcasting dispersants can compound the ecological damage of oil spills. The impacts to plankton communities, which are the foundation of marine food webs and the impacts to the seabed are detrimental.[122] Hence the use of dispersants has socioeconomic consequences as well as environmental and there are still many unknowns about their use.

Chemical dispersants should never be used in sensitive environments and, in any case, would be limited in effectiveness even when they are used. Once again, given the difficulty in adequately responding to an oil spill in the North Atlantic, emphasis should be placed, from a regulatory perspective, on the avoidance and prevention of accidents.

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[121] Paris, C. B. et al. 2018. BP Gulf Science Data Reveals Ineffectual Subsea Dispersant Injection for the Macondo Blowout. *Frontiers in Marine Science*. November 2018.

[122] Buskey, E., H. White, and A.J. Esbaugh. 2016. Impact of Oil Spills on Marine Life in the Gulf of Mexico: Effects on Plankton, Nekton, and Deep-Sea Benthos. *Oceanography* 29(3): 174-181. https://www.researchgate.net/publication/307518241_Impact_of_Oil_Spills_on_Marine_Life_in_the_Gulf_of_Mexico_Effects_on_Plankton_Nekton_and_Deep-Sea_Benthos

5. Required legislative and regulatory changes

The following table connects the regulatory changes recommended in this report with the relevant Canadian and/or provincial statute, policy and/or regulation.

Recommendation	Relevant Legislation/Regulation/Policy
1. Response capacity- Spill response capacity and infrastructure must be dramatically improved.	• Funding and policy commitments required • Change relevant regulations under the *Offshore Area Petroleum Operations Framework Regulations* (e.g. training and competency requirements) • Consider potential requirements, especially infrastructure, under land claim treaties and associated EA processes.
2. Atlantic-specific regulations including a 'Best Available and Safest Technologies' (BAST) requirement – New regulations specific to the North Atlantic must require compliance with international best practices and best technologies, including proven seabed well-capping equipment on site, strict seasonal drilling windows, minimum distances for seismic testing, and immediate relief well capability on stand-by.	• Change relevant sections of *Offshore Area Petroleum Operations Framework Regulations* • Consider other statutes for petroleum activity restrictions (e.g. Canada National Marine Conservation Areas *Act*, Oceans *Act*, Canada Wildlife *Act*, Canadian Energy Regulator *Act* and related regulations).
3. Risk assessment and reduction – The determination of acceptable risk for offshore projects must be carried out *before* a license is granted and must be explicitly described in regulations, requiring the input of all relevant stakeholders, particularly local community representatives, with the objective being to reduce risk to a level that is 'as low as possible'.	• Add standalone regulations to *Offshore Area Petroleum Operations Framework Regulations,* COGOA and/or Impact Assessment *Act* describing risk assessment process • Update COGOA and Canadian Energy Regulator Act to require risk be reduced to ALAP
4. Separation of regulator responsibilities - Regulatory oversight for safety and environmental protection must be separated from the responsibility to enable oil and gas activities.	• Update *Offshore Area Petroleum Operations Framework Regulations,* Canadian Energy Regulator Act, COGOA and CPRA
5. Unlimited accident liability - Atlantic offshore spill liability must be unlimited in order to cover all clean-up costs and compensatory damages	• Amend Energy Safety and Security *Act,* COGOA liability rules and Financial Requirements Regulations • Change Oil and Gas Spills and Debris Liability Regulations

associated with an accident or spill of any magnitude, regardless of fault.	
6. Climate test – Atlantic offshore oil and gas production must be consistent with national and global climate goals and must respect Indigenous rights	• Include requirement in *Offshore Area Petroleum Operations Framework Regulations* CPRA and COGOA, or as separate standalone law.
7. Ecologically, Biologically or Culturally Significant Areas – Areas identified as high-risk, ecologically and biologically significant, or culturally important must be placed off-limits to oil and gas activities. This includes sensitive benthic areas, marine refuges and critical habitat for species at risk.	• Oceans *Act* policy prohibiting oil and gas in MPAs should be strengthened into a binding regulation or statutory amendment. • Fisheries *Act* • Species at Risk *Act* • Canadian Wildlife *Act*
8. Seismic testing - Strengthen evidence-based rules for seismic programs and require alternatives that are less harmful to marine wildlife.	• *Offshore Area Petroleum Operations Framework Regulations* and Canada Oil and Gas Geophysical Operations under the Canada Oil and Gas Operations Act • Statement of Canadian Practice with respect to the Mitigation of Seismic Sound in the Marine Environment

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WWF-CANADA SUBMISSION ON PROPOSED NOVA SCOTIA OFFSHORE AREA PETROEUM OPERATIONS FRAMEWORK REGULATIONS

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1. Introduction

Offshore oil and gas activities represent a genuine threat to the marine environment and the stability of the global climate system. Even if nothing goes wrong, there are unavoidable impacts from each phase of oil development - seismic exploration, drilling waste (fluids and cuttings), pipelines, offshore and onshore terminals, tanker traffic, and so on. If a major spill or a well blowout were to occur in the Atlantic offshore, it would seriously imperil the surrounding marine environment, potentially destroying habitat for whales, fish, sea birds, and many other animals. The consequences for local communities, some of whom depend on healthy and clean waters for their livelihoods could be devastating. Moreover, the very purpose of oil production is to extract and burn more oil, which increases greenhouse gas (GHG) emissions and exacerbates the global climate crisis at a time when scientists say we need to be rapidly reducing GHG emissions.

The Frontier and Offshore Regulatory Renewal Initiative (FORRI) is a joint federal-provincial process that was established to, among other purposes, review and update Canada's offshore oil and gas regulations, which, according to the federal government, "were first established upwards of 34 years ago" and "use prescriptive language, require the use of outdated technologies and/or methodologies and incorporate a number of standards and codes that are now obsolete."[1] Consequently, on June 18, 2022 the Canadian government published the *Canada-Nova Scotia Offshore Area Petroleum Operations Framework Regulations* (the Framework Regulations) in Canada Gazette I with the goal of repealing existing regulations and replacing them with "one consolidated, comprehensive framework regulation in each of the Canada-NL and Canada-NS offshore areas, allowing greater ease of use by regulated parties and regulators."[2]

Some of the conditions that can increase the risk of an accident or well blowout are present in the North Atlantic region, including deep water, extreme weather and the need for exploration and development drilling. For instance, the 2018 Husky Sea Rose FPSO accident off the coast of Newfoundland and Labrador, the largest spill in the province's history, was the result of a severe storm (not uncommon) and poor judgment by the operator to resume operations by attempting to reconnect a flowline in high sea state conditions – storm conditions deemed unsafe to deploy on-water response to the spill. In its review of the Deepwater Horizon disaster, a national commission noted that "deep water drilling brings new risks, not yet completely addressed by the reviews of where it is safe to drill, what could go wrong, and how to respond if something does go awry."[3] The elevated risk of operating in this extreme environment makes it incumbent upon the government to ensure the world's highest standard of regulations are in place to govern oil and gas off the coast of Nova Scotia.

The new Framework Regulations make some welcome and necessary regulatory updates; however, the regulations will not be sufficient to ensure that the highest possible science-based safety and environmental standards are met, including robust and effective well control and emergency response measures. In addition, the new regulations

[1] https://www.gazette.gc.ca/rp-pr/p1/2022/2022-06-18/html/reg5-eng.html
[2] https://www.gazette.gc.ca/rp-pr/p1/2022/2022-06-18/html/reg5-eng.html
[3] https://www.govinfo.gov/content/pkg/GPO-OILCOMMISSION/pdf/GPO-OILCOMMISSION.pdf#page=14

will not ensure that oil and gas development avoids ecologically-sensitive marine areas and is consistent with global and domestic climate goals, and Indigenous rights and agreements. In fact, the Framework Regulations are as notable for their inadequate provisions as they are for the critical issues they omit – most notably, climate change, drilling in ecologically or culturally sensitive areas, and Indigenous rights. This submission therefore proposes a series of proven measures, specific to the North Atlantic, which should be required before any offshore oil and gas activities go ahead. These measures and regulatory reforms, which are described in detail below, must be incorporated into the Framework Regulations, where appropriate, or in other relevant pieces of legislation and/or regulations:

1. **Region-specific BAST requirement:** Require operators to comply with a best available and safest technologies (BAST) mandate, as found in the U.S., which is region-specific and verified by a qualified third party.

2. **Risk assessment:** Require project risk to be reduced to a level that is as low as reasonably *possible* (not *practicable*) and determined through an inclusive, collaborative process involving the regulator, the operator, relevant stakeholders, and independent third-party experts.

3. **Canada-Nova Scotia Offshore Petroleum Board:** Separate the Board's responsibility to facilitate and approve drilling projects from its safety and environmental protection mandate.

4. **Liability:** Make operator liability for oil spills unlimited regardless of fault.

5. **Climate change:** Ensure all new oil and gas production and consumption is consistent with national and global climate goals.

6. **Ecologically and culturally sensitive areas:** Respect Indigenous rights and agreements, and prohibit petroleum activities in or near high risk, culturally important and ecologically sensitive areas.

7. **Seismic testing:** Strengthen evidence-based rules for seismic programs and require alternatives that are less harmful to marine wildlife.

8. **Oil spill response:** Regulations must ensure effective and efficient oil response capacity.

WWF-Canada would like to note that the Framework Regulations include the following statement: "*The World Wildlife Fund commended the government partners' efforts in modernizing the regulatory framework and seeking the advice of stakeholders throughout this process, noting its view that the modernization of the offshore regulatory regime in Canada was long overdue. WWF identified a few areas of concern, including the role of the regulators in interpreting and applying more outcome-based regulations in the absence of prescribed standards, and the inherent principle that operators must ensure that risk is reduced to as low as reasonably practicable*."

We feel that this statement is misleading and we ask that it be removed or amended as it seems to indicate that we support the government's proposed approach to regulatory reform. We do not. While we feel that the modernization of offshore regulations is indeed long overdue, we have more than "a few areas of concern." **The proposed Framework Regulations are flawed and will not be sufficient to ensure that petroleum operations can be carried out safely with the lowest possible risk to the marine environment.**

2. The unique challenges of offshore drilling in Canada's Atlantic offshore region

The North Atlantic should not be considered as one homogeneous region as operational conditions of offshore operations may vary depending on, for example, water depth, proximity to existing support infrastructure in the area and the presence of sea ice. Nevertheless, in general ocean drilling in the region is substantially different from drilling operations in other parts of the world as it presents many distinct safety and environmental concerns. Extreme weather, winter darkness, sea ice, significant geographic distances, deep water, the vulnerability of certain species and ecosystems, and limited environmental response equipment make oil and gas operations more difficult (and expensive) and effective oil spill response much more challenging. In the event of an accident, capping wells could be more difficult, oil spill clean-up may take longer, environmental damage could be more severe, and local communities could suffer substantial harm. The North Atlantic has sensitive and unique ecosystems that are vulnerable to disturbance and are not always well-studied.

In addition, the fishing industry and some communities are heavily dependent on a healthy marine environment for their livelihoods and well-being. The impacts of a major spill or well blowout on the local fishery could be catastrophic and could continue for years. For example, thirty years after the Exxon Valdez spilled 4.2 million liters of crude oil into Prince William Sound in Alaska, the fishing industry has not fully recovered and many Alaskan beaches remain polluted to this day with an estimated 20,000 gallons (75,000 liters) of crude oil buried just inches below the surface[4]. Taken together, these factors substantially increase the risks presented by offshore oil and gas operations in the North Atlantic. [5]

The 2010 Deepwater Horizon blowout demonstrated both the potential risks of offshore drilling and the difficulties involved in cleaning up a spill even in the Gulf of Mexico, a heavily populated region with ample spill response capacity and mild temperatures. Only 25% of the 210 million gallons (800 million litres) spilled into the Gulf was actively recovered (skimmed, burned, or recovered at the wellhead) with another 10%-20% chemically dispersed,[6] and recent research has shown that previously unknown "invisible oil" from the disaster "concentrated below the water's surface and (was) toxic enough to destroy 50% of the marine life it encountered."[7]

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[4] https://www.nytimes.com/2010/05/06/us/06alaska.html

[5] http://www.nap.edu/read/18625/chapter/2#2

[6] http://masgc.org/oilscience/oil-spill-science-where-did-oil-go.pdf

[7] Berenshtein et al. Feb. 2020. Invisible Oil beyond the Deepwater Horizon satellite footprint. *Science Advances.* Vol. 6, no. 7. https://advances.sciencemag.org/content/6/7/eaaw8863

Even *after* the Deepwater Horizon catastrophe, there were seven losses of well control – the precursor to a blowout – in the Gulf of Mexico between 2010 and 2015. Operators are attempting increasingly technically ambitious operations; they are expanding their operations to more extreme environments and attempting to tackle ever more challenging projects.

There is far less response capacity in the Nova Scotian offshore and the environmental conditions are much harsher. The chances of implementing effective oil recovery, even under ideal conditions would be very challenging. The cold conditions, presence of sea ice and lack of daylight during certain times of the year will compound the difficulty of spill response, and cold seas would slow down the oil-digesting bacteria that are crucial in reducing the immediate impact of a spill.[8]

The 2018 Husky Sea Rose spill was the second serious incident involving the Sea Rose FPSO[9] in the last few years. In May 2017, a huge iceberg came within 180 metres of the same vessel, so close that the crew were told to "brace for impact," yet oil production was not halted.[10] That two serious incidents could occur over such a short time span indicates the hazards common in the North Atlantic and highlights the need for adequate preventative measures to ensure that a major spill never takes place and for an extremely effective oil spill response strategy on the part of the operator. At this point, however, it is not clear how an effective response to a major spill in the North Atlantic would be carried out, if it is even possible. Alaska has a legal requirement that equipment be on-hand within 24 hours to cap a well blowout, an obligation that is not required in Canada. Nevertheless, the head of the U.S. Coast Guard has stated that the country is still not prepared to clean up an oil spill in the extremely challenging Alaskan offshore.[11]

> *"We saw during Deepwater Horizon, whenever the seas are over four feet, our ability to mechanically remove oil was virtually impossible. Four-foot seas up there [in the Arctic] would probably be a pretty darned good day….especially if it's in a season where it's inaccessible; that really doubles, triples the difficulty of responding."*

Four-foot seas in the North Atlantic are also very common, which would significantly impede the effectiveness of mechanical oil spill recovery and removal. In addition, drilling project locations tend to be far offshore (500 km approximately), which poses additional challenges to mounting fast and effective spill response. Research amassed to date through various studies suggest that oil behaves differently in icy, freezing water than in warmer waters. Furthermore, the combination of natural variability and climate-forced changes in the northern marine system make it particularly challenging to predict the ice conditions from one year to the next.[12]

The economic viability of Atlantic offshore oil depends on a variety of factors including global oil prices, technological capacity, and the location of the resource. As of this writing, oil prices are

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[8] Donald L. Gautier et al, *Assessment of Undiscovered Oil and Gas in the Arctic*, 324 Science 1175, 1175 (2009); Nat'l Comm'n Report, *supra* note 1, at 41, 73, 174, 300-05.

[9] Floating, Production, Storage and Offloading Vessel

[10] https://www.cbc.ca/news/canada/newfoundland-labrador/husky-energy-searose-production-federal-court-application-1.4658934

[11] Waldman, S. July 19, 2017. The U.S. Is Not Ready to Clean Up an Arctic Oil Spill. *Scientific American.* https://www.scientificamerican.com/article/the-u-s-is-not-ready-to-clean-up-an-arctic-oil-spill/

[12] Wilkinson, J. et al. 2017. Oil spill response capabilities and technologies for ice-covered Arctic marine waters: A review of recent developments and established practices. *Ambio* 46 (Supp 3): S423-S441.

high; however, they have been extremely volatile over the past two years, at one point temporarily plunging below $0 per barrel.

The marginal profitability of North Atlantic oil may compel companies to find ways to reduce operational costs in order for their drilling projects to be viable. According to Dr. Robert Bea, a world-renowned expert on offshore engineering and risk management, "One of the big drivers for increasing production is decreasing costs (decreasing protection). The balance progressively shifts until there is a major system failure — a monetarily-driven spiral to disaster."[13]

Of course, the best way to minimize the damage caused by an accident or an oil spill is to ensure that it never happens in the first place. It is therefore imperative that the government ensures the right regulations and oversight procedures are in place so that the high risks of offshore oil activities in the North Atlantic are minimized to the greatest extent possible and companies cannot cut corners in order to reduce their costs.

3. The Shortcomings of the proposed Framework Regulations

In Nova Scotia, the exploration, production, processing and transportation of oil and gas is governed by the Canada-Nova Scotia Atlantic Accord Implementation *Act* (and a variety of regulations under the *Act*) with the main purpose being to promote the safety of the public and workers, to protect the environment, and to conserve oil and gas resources.[14]

However, there are a number of shortcomings in the proposed Framework Regulations including:

- Insufficient measures to compel adequate and timely oil spill response capacity. No legal regulations to ensure that sufficient people and equipment could respond to a spill from a drilling rig or a ship, nor any obligations to ensure that such a response would occur within a legally required time frame.
- Regulations do not require the use of the Best Available and Safest Technologies (BAST), or that a capping device or relief drilling rig be on site during drilling operations in the event of a loss of well control.
- Regulations do not prevent drilling in ecologically sensitive marine ecosystems, culturally important or high-risk areas.
- No requirement to reduce accident risk to a level that is as low as (reasonably) *possible* (i.e., as opposed to 'as low as reasonably *practicable*').
- No requirement to include local stakeholders, Indigenous groups or members of the broader Canadian public in determining tolerable levels of risk.
- Insufficient liability and financial responsibility rules to ensure that companies (and not taxpayers) are fully liable for clean-up and compensation costs and have the capacity to pay.

[13] https://www.halifaxexaminer.ca/featured/the-worlds-top-expert-on-deep-sea-drilling-disasters-worries-about-the-relatively-high-likelihoods-of-a-blowout-at-bps-scotian-shelf-operation/#1.%20Blowout

[14] https://www.assembly.nl.ca/legislation/sr/statutes/c02.htm#131_1

- Inadequate separation of the regulator's primary responsibility to ensure economic benefits from oil and gas development from its responsibility to enforce safety and environmental regulations and conduct impact assessments.
- No requirement to have any scientific expertise, such as marine biologists or climate scientists, or Indigenous representation on the Board of Directors of the CNSOPB.
- No science-based rules for seismic blasting activity including minimum safe distance requirements specific to the North Atlantic marine environment.
- No requirement to ensure decisions about whether and under what conditions offshore oil and gas activities are consistent with Canadian carbon reduction commitments and with Indigenous rights and agreements.

Some of these additional measures and requirements *could* be imposed on an operator by the CNSOPB at the time of operations licensing and authorization, but the Board is under no explicit obligation to do so and it would be up to the regulator (which is also mandated to ensure economic benefits from oil and gas, as per the Accord Acts) to determine on a case by case basis what additional measures may be required.

In addition, other regulations such as liability limits, financial responsibility, seismic testing rules and impact assessment review panels are enshrined in legislation and cannot be adapted or applied to the Nova Scotia context by the CNSOPB. Explicit rules for operating in the North Atlantic offshore must be enshrined within the Canada-Nova Scotia Atlantic Accord Implementation *Act* and tailored specifically to the unique operational and environmental challenges of the region in order to minimize risks to the marine environment to the greatest extent possible.

4. Eight requirements for safety and environmental protection in Canada's North Atlantic

Recommendation #1: Develop specific rules for offshore operations in the North Atlantic that require the use of the Best Available and Safest Technologies

Comment/Problem: The Framework Regulations do not require an operator to cap a blowout or have a relief drilling rig on site within a prescribed period of time and do not explicitly require the use of the 'best available and safest technologies' that have been proven effective in the past.

Recommendation: The regulations must require (and not just "allow for") the use of the 'Best Available and Safest Technologies' (BAST) that are appropriate to the region, including the requirement that operators keep capping stacks and relief drilling rigs on or near site during drilling operations so they can promptly respond to a blowout or other loss of well control within 24 hours.

Re: Parts 2 and 6

Part 6:
Well Integrity
Well control

68 (1) An operator must ensure that adequate procedures, materials and equipment are in place and used throughout the life cycle of the well to prevent the loss of well control.

Reliable well control equipment

***(2)** The operator must ensure that reliable well control equipment is in place to detect and control kicks, prevent blowouts and safely conduct all well operations.*

Part 2
12(3) the contingency plan must also include a description of the source control and containment measures to stop the flow from an uncontrolled well and to minimize the duration of a spill and its environmental effects,

11 (1) An operator must develop an environmental protection plan that sets out the procedures, practices, resources and monitoring measures that are necessary to protect the environment from the proposed work or activity, including target levels of safety and hazard management.

Part 6: Design measures

103(6) The design of an installation that is to be operated in a cold climate must include measures to

- *(a) ensure its functionality in a cold climate, including in the case of property changes in fluids;*
- *(b) ensure the functionality in that climate of all systems and equipment that are critical to safety and the protection of the environment, including the systems and equipment needed to operate in the event of an emergency;*

Summary

There are no requirements anywhere in the Regulations for the operator to use the best available and safest technologies appropriate to the drilling region. The Framework Regulations require only "adequate" procedures and equipment and that the operator provide simply a "description of the source control and containment measures to stop the flow from an uncontrolled well and to minimize the duration of a spill and its environmental effects." Moreover, an operator must develop "an environmental protection plan that sets out the procedures, practices, resources and monitoring measures that are necessary to protect the environment from the proposed work or activity, including target levels of safety and hazard management". Again, no technology standard is mandated. This is not good enough.

The Well Control regulations rely too heavily on performance standards and should instead *mandate* the use of the 'Best Available and Safest Technologies' (i.e., a BAST requirement) for well control, containment systems, and other procedures that are designed specifically for the extreme conditions found in this region. BAST utilizes a performance-based approach to technology solutions but establishes a minimum standard that relies on consistent and verifiable testing and evaluation of a given technology's operational history, identifies candidate technologies (suggested by industry) for BAST determinations, then evaluates these technologies using consistent and verifiable testing protocols by a verified third party. BAST does not restrict operators to the implementation of specific technologies but would require the application of practices that have been shown to be successful and relevant to those projects that have risk characteristics similar to past operations.

In addition, the regulations should require operators to have immediate access to surface and subsea containment resources (i.e., a capping stack and containment dome) that would be adequate to promptly respond to a blowout or other loss of well control where a capping stack must be onsite within 24 hours.

Rationale

A loss of well control is a release of fluid and/or gas from the well and can be a pre-cursor to a full blowout. It is generally caused by unexpected reservoir pressure, a formation kick or a failure of surface equipment or procedures. Wellhead systems and drilling rigs have multiple, redundant pressure-control systems installed (e.g., drilling muds, blowout preventers (BOPs), and control valves), but all mechanical devices have a failure risk.[15] On a drilling rig, a BOP is the last pressure barrier; if this barrier fails, an uncontrolled well blowout occurs. Even with a BOP in place, blowouts with a flow path to the sea bottom outside the casing cannot be controlled with BOPs and such blowouts are reported to constitute between 20% and 55% of offshore

[15] Arctic Council. 2009. *Arctic Offshore Oil and Gas Guidelines.* Protection of the Arctic Marine Environment Working Group.

drilling blowouts, thus more than half of drilling blowouts may not be susceptible to any BOP control or effects.[16]

The risk of a well blowout in the Atlantic offshore is difficult to assess because there is very little empirical data on which to base a risk assessment. According to the SINTEF database, an average of 2.3 well releases or blowouts per year occurred in the U.K. and Norwegian waters between 1980 and 2008. Even *after* the Deepwater Horizon catastrophe, there were seven losses of well control – the precursor to a blowout – in the Gulf of Mexico between 2010 and 2015. Operators are attempting increasingly technically ambitious operations; they are expanding their operations to new, often environmentally sensitive areas and the industry continues to tackle ever more challenging projects.

Requirements for well control, design of the drilling rig, the blowout preventer, cementing practices and other safety technologies are therefore a crucial element in any offshore regulatory regime. Currently, proposed the Framework Regulations require that an operator prove that, in the event of a loss of well control, "the operator must ensure that any necessary corrective measures to rectify the situation are taken without delay" (pg. 206) and the project proponent must describe in its contingency plan the "source control and containment measures to stop the flow from an uncontrolled well" (pg. 176). However, there are no regulations requiring subsea containment resources (such as capping stacks and relief drilling rigs) to be on site during drilling operations or to demonstrate access to these resources within a prescribed period of time after well control is lost.

A number of measures that have been proven effective can be taken to reduce the risk of a loss of well control, respond to a blowout and eliminate or minimize the impacts of regular operations. These include, but are not limited to, the following requirements:

- Operators must be required to have immediate access to surface and subsea containment resources that would be adequate to promptly respond to a blowout or other loss of well control, as is the case in Alaska, where a capping stack must be onsite within 24 hours.[17]
- Drilling rigs must have redundant BOP systems installed to ensure the equipment functions in an emergency.[18] Subarctic platforms that are used off the coast of Nova Scotia need to be much stronger than temperate-water platforms.[19]

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[16] Bercha, Frank. G. 2010. Arctic and Northern Offshore Oil Spill Probabilities. *Proceedings in the International Conference and Exhibition on Performance of Ships and Structures in Ice (ICETECH 2010).* Anchorage, Alaska. September 20-23, 2010.

[17] https://www.federalregister.gov/documents/2016/07/15/2016-15699/oil-and-gas-and-sulfur-operations-on-the-outer-continental-shelf-requirements-for-exploratory

[18] Pew Charitable Trusts. Sept. 2013. *Arctic Standards: Recommendations on Oil Spill Prevention, Response, and Safety in the U.S. Arctic Ocean.*

[19] Michael E. Utt, Union Oil Co. of California, "Sea Ice Forces and the State of Technology of Offshore Arctic Platforms," Journal of Petroleum Technology, no. 37, January 1985: 21-6. Calculated using:—K.D. Vaudrey, "Derivation of Ice Forces for a Large Arctic Gravity Structure." Paper presented at the 1982 Arctic Offshore Drilling Platform Symposium, Global Marine Development Inc., Los Angeles, 1982; and —T. Ralston, "Ice Force Design Considerations for Conical Offshore Structures." Proceedings of the Fourth International Conference on Port and Ocean Engineering Under Arctic Conditions, Newfoundland, 1977.

- BOP standards should be more stringent such that they are suitable for operation in sub-freezing conditions, include third-party verification and periodic recertification, and redundant (double) blind shear rams.
- Fuel transportation, supply, and oil spill response vessels and tugs that are part of exploration, development, or production operations must be designed with vessel hulls and specialized systems to function safely in cold water.
- Discharge of drilling muds, cuttings, sanitary wastes, produced water, and all other discharges should be prohibited where technically feasible methods of collection exist.
- In addition to traditional exploration and production education, training, and experience, personnel working in the North Atlantic must be required to have unique training in regional competencies and qualifications.

These are just a few examples of requirements that would be necessary to ensure the safety and minimize the risk of an offshore drilling project in the North Atlantic. As offshore operations are becoming increasingly complex and technologies are regularly changing, it is beyond the scope of this submission to list all possible technical requirements. More critical is the need for Canadian regulations to require the overarching application of specific technologies that comply with a 'Best Available and Safest Technology' standard, which independent technical experts can then apply against a project proposal at the impact assessment and license authorization stage. The Arctic Council recommended just such an approach in 2009 when it recommended "the use of best available technology/techniques and best available practices for offshore oil and gas activities."[20]

Best Available and Safest Technologies (BAST) requirement

The Framework Regulations are proposing a "technology neutral approach, which would allow for the use of best available technologies and/or methodologies" (pg. 126) and allow operators (with approval of the Board) to ensure "innovative approaches that enhance safety" (pg. 132). While this is a positive development, it does not *mandate* the use of best available and safest technologies in well control, containment systems, or other procedures. It only "allows for" the use of BAST technologies, which is not sufficient.

In contrast, Greenland's regulations under the *Mineral Resources Act* are supplemented by the overall objective of aiming "to *ensure* that activities under the *Act* are securely performed as regards safety, health, the environment, resource exploitation and social sustainability as well as properly performed according to acknowledged best international practices under similar conditions" (emphasis added).[21] Note that Greenland's regulations do not "allow for" BAST; they aim to *ensure* the BAST requirement is met.

The U.S. Outer Continental Shelf Lands Act (OCSLA) also requires the use of "best available and safest technologies" on all new drilling and production operations, with only the secretary

[20] The Arctic Council's 2009 'Arctic Offshore Oil and Gas Guidelines' defines "best available techniques" as the "latest stage of development (state of the art) of processes, of facilities, or of methods of operation" and "best environmental practice" as the application of the most appropriate combination of environmental control measures and strategies.

[21] *MRA*, s 1(2).

having the authority to determine whether the incremental benefits are "clearly insufficient" to justify the incremental costs of utilizing BAST.[22]

> *(b) Use of best available and safest economically feasible technologies. In exercising their respective responsibilities for the artificial islands, installations, and other devices referred to in section 1333(a)(1) of this title, the Secretary, and the Secretary of the Department in which the Coast Guard is operating, shall require, on all new drilling and production operations and, wherever practicable, on existing operations, the use of the best available and safest technologies which the Secretary determines to be economically feasible, wherever failure of equipment would have a significant effect on safety, health, or the environment, except where the Secretary determines that the incremental benefits are clearly insufficient to justify the incremental costs of utilizing such technologies.[23] (Emphasis added.)*

BAST utilizes a performance-based approach to technology solutions but establishes a minimum standard that relies on consistent and verifiable testing and evaluation of a given technology's operational history, identifies candidate technologies (suggested by industry) for BAST determinations, then evaluates these technologies using consistent and verifiable testing protocols by a verified third party. BAST does not restrict operators to the implementation of specific technologies but would require the application of practices that have been shown to be successful and relevant to those projects that have risk characteristics similar to past operations. Best practices for a particular source will change with time in the light of technological advances, economic and social factors, as well as changes in scientific knowledge and understanding.[24] Thus operators would not be tied to the implementation of specific technologies as the BAST standard would change and evolve over time. Industry operators themselves called for such a requirement in 1991 stating "the best available equipment and procedures are the minimum acceptable" in a report for the Beaufort Sea Steering Committee.[25]

The risks of offshore drilling in the North Atlantic are too high to justify allowing the regulator to decide on a case-by-case basis what constitutes "reasonably practicable" procedures andequipment to ensure safety and environmental protection. It is not clear how the CNSOPB will independently determine what constitutes a best industry standard or best available technology. The Framework Regulations only state that the Board must approve the operator's proposed approach. Given the Board's conflicting mandate to help facilitate offshore oil production and to ensure safety and environmental protection (see #3 below), the Framework Regulations must require that an independent technical expert is required to evaluate whether a project proposal meets the BAST requirement.

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[22] https://www.govinfo.gov/content/pkg/USCODE-2015-title43/html/USCODE-2015-title43-chap29-subchapIII-sec1347.htm

[23] https://www.govinfo.gov/content/pkg/USCODE-2015-title43/html/USCODE-2015-title43-chap29-subchapIII-sec1347.htm

[24] Arctic Council. 2009. *Arctic Offshore Oil and Gas Guidelines.* Protection of the Arctic Marine Environment Working Group.

[25] AOE Consultants. "Operating Seasons for Beaufort Sea Drilling Systems." Prepared for Beaufort Sea Steering Committee. February 1991.

Performance-based vs. Prescriptive Regulations

Well control regulations under the Framework Regulations are largely performance-based in that they do not prescribe the use of any specific technologies. It is up to the CNSOPB to determine whether an operator has adequate procedures and equipment in place to prevent and respond to the loss of well control. No specific well control technologies such as capping stacks or containment domes are prescribed in Canadian regulations or required on site and there are no maximum response time limits. Underlying this approach is the assumption that performance-based rules will necessarily lead to more flexibility for operators than prescriptive rules in adopting new technological innovations and better outcomes for safety and environmental protection.

Performance-based regulations are common in some industries and can have the advantage of allowing for the adoption of new technologies. While Norway uses largely performance-based well-control and drilling regulations, the country also has the most experience using what is known as a 'Safety Case regime'.[26] [27] Norway's regulator, the Petroleum Safety Authority, is considered the leader in offshore safety practices. The PSA is responsible only for oversight, safety and environmental protection, and is not responsible for enabling or facilitating offshore drilling, as is the case for the CNSOPB. The PSA has established a "good collaboration" with offshore industry players, labor unions and relevant specialists, such that all sectors of the industry have confidence in the PSA's reports. Moreover, Norway's citizens are informed about risk levels and individual company practices through the PSA website, which has summaries of all audit and verification reports, investigations, consents to operator activities, and enforcement notices. The PSA reports exemplify a dialogue between industry, labor, the citizenry and the regulator built on a strong foundation of trust. As discussed in Recommendation #3 (below), the CNSOPB has not established anywhere near the same level of trust with the Canadian public, quite the opposite.

It is true that reliance on a purely prescriptive regulatory regime may not work as well for a variety of reasons (e.g. places more responsibility on the regulator, little flexibility, extremely variable conditions, lack of history/data to apply rigorous requirements, etc.).[28] However, a heavier reliance on performance-based approaches will also have challenges and will require a much greater need for collaboration between regulators and operators since the risks of an accident are higher due to the potentially catastrophic consequences and our limited ability to respond effectively and promptly to a major spill. In a 2013 report, Natural Resources Canada concluded that "when the risk or consequences associated with an activity are high…outcome-based regulations may not be appropriate; particularly if a suitable technology already exists."[29]

The United States and Russia have retained or even strengthened some of their prescriptive rules in the offshore petroleum industry in recent years. For instance, in 2016, the United States government introduced a set of prescriptive rules aimed at preventing the kind of equipment

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[26] Weaver, Jacqueline. Offshore Safety in the Wake of the Macondo Disaster: The Role of the Regulator. Houston Journal of International Law. Vol. 36:2. March 2014.

[27] A safety case is a document produced by the operator of a facility that identifies the hazards and risks, describes how the risks are controlled, and describes the safety management system in place to ensure the controls are effectively and consistently applied and that safety performance is continually monitored and improved. Once a safety case has been accepted by the regulator, it becomes the rules with which the operator must comply.

[28] PAME, 2014.

[29] http://www.nrcan.gc.ca/mining-materials/publications/11732#a0

failures that led to the disastrous 2010 Deepwater Horizon oil spill in the Gulf of Mexico.[30] An investigation into the blowout revealed that the oil industry had insisted upon the safety of its operations and the reliability of its blowout preventers.[31] In response to the accident, the government added stricter requirements to the design of undersea wells and tightened rules on blowout preventers, with no opt-out provision, such that the use of double shear rams is now required to provide backup in the event of equipment failure.[32] No such requirement exists in the proposed Framework Regulations.

In justifying the new BOP rule, the U.S. Bureau for Safety and Environmental Enforcement (BSEE) wrote in 2016 that, despite the additional cost to operators, the prescriptive rule was "necessary to reduce the likelihood and/or severity of any oil or gas blowout, which can lead to the loss of life, serious injuries, and harm to the environment. As evidenced by the Deepwater Horizon incident… blowouts can result in catastrophic consequences… Despite new regulations (prior to 2016) and improvements in industry standards and practices since the Deepwater Horizon incident, loss of well control (LWC) incidents are happening at about the same rate five years after that incident as they were before".[33]

In 2016, the U.S. introduced an Arctic Drilling Rule which added new requirements to regulations for exploratory drilling and related operations.[34] The government justified the need for Arctic-specific rules by citing "the extreme environmental conditions, geographic remoteness, and a relative lack of fixed infrastructure, and existing operations."[35] Specifically, the regulations require companies to have the ability to drill a relief well and plug a compromised well permanently before seasonal ice encroaches on the drill site or within 45 days, whichever is sooner, and have access to – and the ability to promptly deploy – source control and containment equipment, such as capping stacks and containment domes, while drilling below or working below the surface casing.

> *Specifically, revised 250.471(a) requires that a capping stack be available and positioned to arrive at the well within 24 hours after a loss of well control, and a cap and flow system and a containment dome be positioned to ensure they will arrive at the well location within 7 days after a loss of well control.*[36]

In addition to adopting a "best available and safest technologies" (BAST) requirement as an overarching objective for all its offshore regulations for all components of an offshore drilling program, the government of Canada must also prescribe that capping/containment and relief drilling equipment be kept on or near site. This would not prescribe which capping technologies must be used but it would help to ensure that the operator meets a specified safety performance level while leaving less discretion for a CNSOPB panel to make judgments on what constitutes a "reasonably practicable" risk reduction measure, which is the current standard under the proposed Framework Regulations (see Recommendation #2 below).

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[30] https://www.gpo.gov/fdsys/pkg/FR-2016-04-29/pdf/2016-08921.pdf
[31] http://www.nytimes.com/2010/06/21/us/21blowout.html
[32] https://www.bsee.gov/sites/bsee.gov/files/fact-sheet/bsee/fact-sheet-proposed-well-control-rule.pdf
[33] https://www.bsee.gov/sites/bsee_prod.opengov.ibmcloud.com/files/aa11-bsee-well-control-ria.pdf
[34] https://www.bsee.gov/guidance-and-regulations/regulations/arctic-rule
[35] https://www.federalregister.gov/documents/2016/07/15/2016-15699/oil-and-gas-and-sulfur-operations-on-the-outer-continental-shelf-requirements-for-exploratory
[36] https://www.federalregister.gov/documents/2016/07/15/2016-15699/oil-and-gas-and-sulfur-operations-on-the-outer-continental-shelf-requirements-for-exploratory

Training and Third-party Inspection

In his Safety Culture Review for the National Energy Board's *Review of Offshore Drilling in the Canadian Arctic*, Dr. Mark Fleming cited four common training/cultural factors identified in inquiry reports from 17 major disasters, including the offshore disasters *Piper Alpha*, *Ocean Ranger*, and *Deepwater Horizo*n:[37]

- Tolerance of inadequate systems and resources
- Deviation from safety policy becomes normal
- Complacency
- Work pressure

The North Atlantic is a frontier area where some regions are characterized by specific physical environmental conditions and where technology and practices are pushing the limits of experience. Drilling in the Nova Scotia offshore entails specific professional competencies and qualifications that may involve extensive college training, apprentice training and/or long-term work experience. In addition to traditional exploration and production education, training, and experience, personnel working in the region require unique training in specific competencies and qualifications.

The proposed Framework Regulations require operators to "ensure that any person to whom a duty is assigned or who carries out a work or activity under these Regulations has the necessary experience, training, qualifications and competence to carry out that duty, work or activity safely and in compliance with these Regulations" (page 167). However, there are no explicit training requirements and it is up to operators to determine what constitutes the "necessary" experience and training and there is no requirement to inform the CNSOPB of personnel qualifications. By comparison, Greenland requires operators to undergo an operator prequalification program to demonstrate they have the expertise, experience, and capacity to "undertake drilling activities offshore in harsh remote Arctic locations" prior to leasing.[38] Norway and Greenland both require the operator to provide extensive information on personnel competencies and qualifications.[39]

The Canadian government must establish standards for drilling, completion, workover, and facility operation personnel training and qualifications (including cementing contractors, well stimulation contractors, and so on) that are specific to the North Atlantic context. Each operator should be required to demonstrate its exploration and production expertise, experience, capacity and qualifications as part of its exploration and production plans.

While the Framework Regulations do require that a Certificate of Fitness be prepared by an independent and recognized certifying authority, it is critical that an independent Well Control Engineer and/or drilling engineer review the well design/drilling plan and be onboard the rig at all times during drilling operations. Authorized and qualified representatives from the regulator should have the legal base to access the installations and to see all relevant documentation and

[37] Fleming, M. 2011. Importance of Safety Culture: Lessons from disasters. Presentation at the NEB roundtable Arctic drilling review. Inuvik, Canada

[38] Greenland Bureau of Minerals and Petroleum, Exploration Drilling Guidelines, May 2011.

[39] NORSOK Standard D-010, Well Integrity in Drilling and Well Operations, rev. 3, August 2004: 24.—Greenland Bureau of Minerals and Petroleum, Approval of up to 7 (Seven) Exploration Wells in Accordance with Section 15 of Licenses 2002/15, 2005/06, 2008/11, and 2011/16, Cairn Energy License Approval Letter, May 2011.

equipment at any time. As recommended by the Arctic Council, "Ensure continuous improvement through…both regular (and random) inspections; and conducting audits that examine company safety meeting records, maintenance logs, operator follow-up to known deficiencies, results of company internal audits, employee questionnaires, etc."[40] Finally, the report from compliance monitoring activities should be made available to the public.

Recommendation #2: Ensure project risk is reduced to a level that is 'as low as possible'

Comment/Problem: Operational risk analysis is carried out by the operator and need only be reduced to a level that is 'as low as reasonably practicable' in the Framework Regulations. Risk assessment and impact review panels are not required to include local stakeholder representation and do not represent the broader Canadian public.

Recommendation: Risk assessment must be determined through structured, collaborative processes that involves all stakeholders, with the objective being to reduce project risk to a level that is 'as low as (reasonably) *possible'*.

Re: part 8 preamble:

The proposed Regulations would establish a more robust framework for the design of installations, which would be rooted in comprehensive technical analysis and risk assessment, with the ongoing obligation of the operator to ensure that risk is reduced to as low as reasonably practicable.

Part 8

106 (1) An operator must ensure that an assessment of fire and explosion risks and of risks associated with hazardous gas and its containment is conducted for any installation.

Part 3:

3(e) any measures that the operator intends to implement to reduce safety and environmental risks to a level that is as low as reasonably practicable in respect of the design of the installation, including its systems and equipment

Part 2:

2(f) identify all assumptions and control measures that are to be implemented to reduce the risks associated with the identified hazards to a level that is as low as reasonably practicable

Part 2: Environmental protection plan

[40] PAME, 2014.

11(1) An operator must develop an environmental protection plan that sets out the procedures, practices, resources and monitoring measures that are necessary to protect the environment from the proposed work or activity, including target levels of safety and hazard management.

Summary

The operator should not be responsible for or relied upon to carry out their own risk assessment analysis (part 8 106(1)). Who will determine whether project and installation risk has been reduced to a level that is "as low as reasonably practicable" and by what criteria will this assessment be made? This is a subjective evaluation and the Framework Regulations are far too vague or even silent on this crucial question. The actual determination of acceptable risk for a proposed project should flow from a social process that is explicitly described in the Framework Regulations and requires several layers of corroborations and validations with the input of the following stakeholders:[41]

> **1) the affected public and local communities including Indigenous organizations;**
> **2) governments of those affected (local, provincial/territorial, federal);**
> **3) commercial/industrial groups;**
> **4) civil society including independent experts in analyzing offshore drilling risk.**

The Framework Regulations must include a requirement that operating risks be reduced to a level that is 'as low as possible' (or ALAP). This would help circumvent the need for a subjective assessment of acceptable risk reduction inherent to the ALARP standard and would eliminate economic cost as a rationale for not reducing the likelihood of a safety risk. Only the Minister should have the authority to determine whether the incremental benefits are "clearly insufficient" to justify the incremental costs of achieving the ALAP standard.

Rationale

When assessing the risk of offshore oil and gas drilling, it is necessary to consider the possible *consequences* of an accident along with its potential *likelihood*. Risk level is typically defined by:

> **Risk = Probability of Event X Consequence of Event[42]**

While it may be true that the likelihood of a Deepwater Horizon type of blowout is small, the *consequences* of such an event would be much more devastating in the North Atlantic than

[41] The 2009 Arctic Council Guidelines recommend that government agencies, local communities and non-governmental organizations be enabled to participate in environmental management of offshore activities.
[42] Oil Spill Response Joint Industry Project. 2013. *Oil spill risk assessment and response planning for offshore installations.*
http://www.oilspillresponseproject.org/wp-content/uploads/2016/02/JIP-6-Oil-spill-risk-assessment.pdf

elsewhere due to the tremendous difficulty of ensuring adequate oil spill response in remote locations with limited infrastructure and the heightened sensitivity of the marine environment to pollution. A relatively common and non-threatening hazard found elsewhere, such as shallow gas or active faults, may pose a much greater risk in the more extreme conditions encountered in the region.

Deficient risk assessment and hazard identification were identified by Det Norske Veritas as two of the safety system management elements that can lead to a major accident in their study for the National Energy Board's Arctic Drilling Review.[43] A risk framework must distinguish among acceptable, unacceptable and tolerable risks associated with the offshore petroleum industry. Acceptable risks require no further mitigation measures; unacceptable risks are so serious that they cannot be allowed; and tolerable risks can be allowed but must be reduced to a level agreed-upon by all relevant stakeholders. This framework must encompass both the "ordinary" impacts of industrial activity, as well as the risks of very large oil spills, worst-case scenario blowouts and other unlikely but not impossible accidents. **The new Framework Regulations must therefore acknowledge that some risks are unacceptable and that continuous risk reduction is a requirement for projects and activities that are deemed tolerable.** In addition, the regulations must be based upon the highest standards of transparent governance and developed through structured, collaborative processes that establish socially-acceptable boundaries between tolerable and unacceptable risks.

'As Low As (Reasonably) Possible' (ALAP) Risk Reduction

New Framework Regulations make repeated use of the ALARP (as low as reasonably practicable) risk reduction principle when discussing safety and environmental protection measures. ALARP allows a regulator to set goals for duty-holders, rather than being prescriptive and, as such, it involves a subjective judgment weighing a risk against the trouble, time and expense needed to control it. It is not clear how ALARP will be interpreted, validated, verified and enforced in practice by the CNSOPB or whether the regulator will have the required expertise across a variety of fields to do so. The ALARP concept has intentionally not been defined in the regulations to allow for more flexibility in its interpretation and application.

In the event of an accident, the test of whether risk reduction measures were "reasonably practicable" would be determined by the courts only *after* the accident takes place. Leaving aside the fact that deciding *ex post facto* in the courts whether an operator took reasonable precautions to minimize risk does nothing to prevent an accident from occurring in the first place, courts have ruled in similar cases that they are not necessarily equipped to make determinations on issues that even experts in the field cannot agree upon. The Supreme Court has not ruled on any cases clarifying the meaning of ALARP, yet Canadian courts can rely on the English common law to guide decisions where there is no previous precedent. As such, in *Edwards v. National Coal Board (U.K.,* 1949), the court ruled that the duty holder must show there must be a "gross disproportion" between the risk reduction and the sacrifice, for it to be considered not reasonably practicable, but the court did not specify what would constitute such

[43] Det Norske Veritas. 2011. Major Hazard Incidents. Arctic Offshore Drilling Review. National Energy Board. https://apps.cer-rec.gc.ca/REGDOCS/Item/Filing/A30021

a disproportion.[44] Factors come into play such as ongoing costs set against remote chances of one-off events.

There is no reference to the ALARP standard in the General Nuclear Safety and Control Regulations under Canada's Nuclear Safety and Control *Act*, with the closest wording being the requirement to take "all reasonable precautions" to ensure safety.[45] In the case of *Energy Probe et al. v. Attorney General of Canada* (1994), the presiding judge stated that because acceptable levels of operational safety in nuclear reactors is not firmly established even amongst experts, a court is *even less equipped* to make determinations as to what factors could increase the risk of nuclear accidents.[46] Similarly, it would likely not be a simple matter for the courts to determine appropriate operational risk levels in offshore oil and gas operations in the North Atlantic, which can be highly technical and are increasingly complicated.

The decision of the Canada-Nova Scotia Offshore Petroleum Board (CNSOPB) to allow BP to keep a capping stack in Stavanger, Norway for its drilling operations in the Scotian Basin provides a useful example of the challenges inherent in using the ALARP principle in the risk assessment process.[47] The Board accepted the company's argument that the low risk of a blowout and the prohibitive cost involved made keeping the capping stack on site not a "reasonable" risk reduction measure.[48] In defending this decision, the CNSOPB stated that a blowout preventer (BOP) is already required on the wellhead and that a heavy lift vessel would be needed to deploy the capping stack, which is not typically available on the eastern seaboard but is available in Stavanger.[49] While these explanations provide some rationale for the Board's decision, they do not explain how the CNSOPB determined that requiring a capping stack on site would be a "grossly disproportionate" risk reduction measure under ALARP. At what point and by what criteria does the regulator decide that there exists a "gross disproportion" between a risk reduction measure and the additional cost to the operator? Determining ALARP is not a science and relies to a large degree on subjective reasoning. As indicated by the U.K.'s Health and Safety Executive, "Deciding whether a risk is ALARP can be challenging because it requires duty-holders to exercise judgement" and many decisions about risk and the controls that achieve ALARP are not so obvious.[50] It is up to the regulator (CNSOPB) to determine whether a company's proposed operational plan (its 'Safety Case Regime') does indeed reduce risk to the greatest (reasonable) extent possible.

For this reason, the knowledge, experience and motivations of the people who form the regulatory system are critical. Using a performance-based regulatory regime requires regulators to have broader supervisory skills and perspectives than a typical prescriptive regime. Regulators must be well trained and possess wider skill sets in order to effectively monitor and enforce safety and environmental protection.[51] As noted, a 2013 study for the National Energy

[44] https://www.xperthr.co.uk/law-reports/edwards-v-national-coal-board/49729/
[45] https://laws-lois.justice.gc.ca/eng/regulations/sor-2000-202/index.html
[46] https://www.scc-csc.ca/case-dossier/info/counsel-procureurs-eng.aspx?cas=19122
[47] http://thechronicleherald.ca/novascotia/1553818-opponents-of-ultra-deep-bp-well-of-n.s.-coast-speaking-at-smu
[48] https://www.cnsopb.ns.ca/sites/default/files/pdfs/bp_stakeholder_engagement_and_aboriginal_consultation_report.pdf
[49] https://www.cnsopb.ns.ca/media/the-facts/spill-prevention-and-response
[50] http://www.hse.gov.uk/risk/theory/alarpglance.htm
[51] PAME, 2014.

Board found that, of the 17 offshore disasters examined, 14 contained cultural causes such as tolerance of inadequate systems and resources, acceptance of substantial departures from safety policy/processes, and complacency.[52] In order to obtain the necessary trust and project support from local communities and Canadians in general, the regulator must be completely independent, representative of the broader public and have the required capability, training and legitimacy to apply credible risk assessment and management processes when evaluating project proposals. This is not currently the case.

As recommended by the Arctic Council's PAME Working Group, "Arctic countries must ensure that regulators are properly trained in techniques and practices of a performance-based regime, and that such a system is adequately funded and staffed."[53] Currently, CNSOPB regulators chair the review panels for offshore oil and gas assessments and represent a majority on these panels. This is despite the fact that the government's own expert review panel on modernizing the impact assessment process had recommended that there should be no role for offshore regulators in impact assessment.[54] The conflict of interest provisions in the CNSOPB legislation does not prevent former employees of or consultants for companies that are regulated by the CNLOP B from becoming members of the Board of Directors, the Chief Executive Officer, or Commissioners who are ultimately responsible for adjudicating the merits of a proposed project.[55]

In cases where immediate and effective oil spill response capacity does not exist or is insufficient and the consequences of an accident are severe, as in the North Atlantic, ALARP may not be an appropriate risk reduction standard. Instead, a requirement under Canadian law that operating risks be reduced to a level that is 'as low as (reasonably) possible' (or ALAP) would help circumvent the need for a subjective assessment of acceptable risk reduction inherent to the ALARP standard. Under an ALAP requirement, only the Minister would have the authority to determine whether the incremental benefits of further risk reduction measures are "grossly disproportionate" to justify the incremental costs. ALARP has a legal interpretation which implies that financial considerations must be taken into account,[56] yet the consequences of a major spill in the North Atlantic are so severe that almost everything possible, regardless of cost, should be done to reduce risk. One could easily imagine a scenario in which the risks of a blowout are deemed intolerable by local communities because the consequences would be so serious, but tolerable in the view of the regulator or project proponent. In such a case, the incremental costs of any marginal risk reduction would always be justifiable for the community regardless of cost and ALARP would not be the best risk-reduction strategy.

The ALAP standard is already required in fields such as medical device equipment, in which the ISO standard in the European Union was changed from ALARP to ALAP in 2013 in order to prohibit the use of economic cost as a rationale for not reducing the likelihood of a safety risk.[57] The same argument should be applied in the North Atlantic. Given the stakes, there can be no

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[52] Fleming, M. 2011. Importance of Safety Culture: Lessons from disasters. Presentation at the NEB roundtable Arctic drilling review. Inuvik, Canada

[53] PAME, 2014. P. 13.

[54] https://www.nrcan.gc.ca/sites/www.nrcan.gc.ca/files/pdf/NEB-Modernization-Report-EN-WebReady.pdf

[55] https://www.parl.ca/DocumentViewer/en/42-1/bill/C-69/royal-assent#ID0E2FEM

[56] https://medicaldeviceacademy.com/alarp/

[57] http://expedoc.com/B2e////index.php/alap-as-low-as-possible

justification for using cost as an excuse for not taking every necessary measure to reduce risk when effective and immediate oil spill response is in doubt. The Framework Regulations should not commit to the highest 'reasonable' safety and environmental standards or the highest standards that industry can afford.

Drawing again upon the example above, in its decision to allow BP to keep a capping stack in Norway, the CNSOPB acknowledged that the device *is* required in the Alaskan Arctic due to the remoteness of the region and the short drilling season, which significantly increases the overall risk as a capping stack may not arrive before ice could move back in at the end of the drilling season, thus exacerbating the extreme consequences associated with a major spill. An ALAP risk reduction standard would almost certainly require that a capping stack be kept nearby any offshore drilling operation, as well as a relief drilling unit, whereas the ALARP standard may not, as it would leave it up to the discretion of the regulator.

Even if ALAP is introduced, there may well be cases in which no level of risk (even if reduced to the greatest extent possible) is acceptable to local communities. It is therefore incumbent upon the government to ensure that the risks for offshore drilling projects are determined, not just by the regulator alone, but from a structured collaborative process involving impacted stakeholders and requiring the free, prior and informed consent of local Indigenous populations.[58] The actual determination of acceptable risk for a proposed project should flow from a social process that is explicitly described in the Framework Regulations and requires several layers of corroborations and validations with the input of the following stakeholders:[59]

1) the affected public and local communities including Indigenous organizations;
2) governments of those affected (local, provincial/territorial, federal);
3) commercial/industrial groups; and
4) civil society including independent experts in analyzing offshore drilling risk.

A good example of the need for a multi-stakeholder risk assessment process comes from a recent case in Australia. In 2016 BP had proposed to the Australian National Offshore Petroleum Safety and Environmental Management Authority (NOPSEMA) to drill exploratory wells in the Great Australian Bight. BP stated to the government that the company had taken sufficient measures to reduce the risks to ALARP, but an independent review of BP's proposal documentation indicated that BP's risk assessment was not correct and its proposed measures were inadequate.[60] This led to NOPSEMA requiring BP to implement further measures to develop ALARP risks, and provide the required analyses, validation and documentation of the analyses. This included additional ALARP risk management measures such as requirements for a near-drilling location capping stack and relief well drilling unit. Subsequently, BP withdrew its proposal to drill, despite it being approved initially by the Australian regulator. Regulators do not always have the required experience or expertise and do not necessarily represent the lower risk tolerance of local communities and the general public.

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[58] Bea, Robert. 'US permits Arctic drilling but questions about safety remain.' The Conversation. May 22, 2015.
[59] The 2009 Arctic Council Guidelines recommend that government agencies, local communities and non-governmental organizations be enabled to participate in environmental management of offshore activities.
[60] Bea, Robert. Submission to The Senate Standing Committees on Environment and Communications: Inquiry into Oil or Gas Production in the Great Australian Bight. October 2016.

Recommendation #3: Separate the CNSOPB responsibility to facilitate projects from safety oversight

Comment/Problem: The CNSOPB is in charge of both enabling oil recovery and value to create jobs, as well as overseeing safety and environmental issues.

Recommendation: The regulator responsibility to facilitate the carrying out of sound projects must be completely separate from its role of ensuring safety and environmental protection.

Re: Part 6 (Drilling and Production)

71 (1) The operator of a well must ensure that

- **(a)** the well is completed, tested and operated in a safe manner that allows for maximum recovery of petroleum without waste or pollution throughout the life cycle of the well;

79 An operator must, in respect of the recovery of petroleum, ensure that

- **(a)** recovery from a pool or zone is maximized in accordance with good oilfield practices;
- **(b)** wells are located and operated to provide for maximum recovery from a pool or zone; and
- **(c)** if there is reason to believe that infill drilling or implementation of an enhanced recovery plan might result in increased recovery from a pool or field, studies on those methods are conducted and submitted to the Board.

Summary

The Framework Regulations explicitly mandate operators to ensure the "maximum recovery of petroleum." This is consistent with the CNSOPB's role under the Accord Acts in ensuring economic benefits from oil and gas while also regulating the industry to ensure safety and environmental protection.[61] There are no requirements to include local stakeholder representatives on project review panels or for the CNSOPB to have any scientific expertise, such as marine biologists or climate scientists, or Indigenous representation on its Board of Directors. Investigations into previous offshore accidents have highlighted the critical importance of clearly separating under different agencies the responsibility to help enable oil production from the need to manage safety and protect the environment.[62] [63]

[61] https://laws-lois.justice.gc.ca/eng/acts/C-7.5/
[62] https://www.cbc.ca/news/canada/newfoundland-labrador/deepwater-horizon-commissioner-comparisons-to-nl-1.5253251
[63] https://www.govinfo.gov/content/pkg/GPO-OILCOMMISSION/pdf/GPO-OILCOMMISSION.pdf

Rationale

There is a public expectation that risks from offshore petroleum operations in Nova Scotia will be properly regulated and controlled, and that regulators will be free from real or perceived conflicts of interest. The stakes are too high and the potential risks too great for the best available risk assessment and management processes (sometimes known as the 'Safety Case Regime'[64]) not to be diligently applied to any proposed offshore drilling operations. In 2017, the government's own Expert Review Panel on Environmental Assessments concluded that "An authority that does not have concurrent regulatory functions can better be held to account by all interests than can entities that are focused on one industry or area and that operate under their own distinct practices."[65] Investigations into previous offshore accidents, such as the BP Deepwater Horizon disaster in 2010 and the Piper Alpha explosion in 1988, have highlighted the critical importance of clearly separating under different agencies the responsibility to help enable oil production from the need to manage safety and protect the environment.[66] [67]

Despite this, under the Framework Regulations the CNSOPB will continue in its conflicting roles to ensure economic benefits from oil and gas, as per the Accord Acts, while also regulating the industry to ensure safety and environmental protection.[68] Moreover, there is nothing preventing former employees of companies that are regulated by the CNSOPB from becoming members of project review panels. There are also no requirements to include local stakeholder representatives on the panels or for the CNSOPB to have any scientific expertise, such as marine biologists or climate scientists, or Indigenous representation on its Board of Directors.

In this context, it is understandable that some observers believe the Boards are in a perceived or real conflict of interest or even experiencing regulatory capture given their close relationship with the oil industry,[69] and and some community groups perceive that regulations are made to support oil activity rather than to promote environmental protection.[70] Representatives from the fishing industry and local communities have also expressed concern that the Board in Nova Scotia has been "partly co-opted by the petroleum industry."[71] As Chief Jean-Charles Pietacho of the Conseil des Innu told The Narwhal, "I know from experience, the decisions are already made and after that they come tell us that they are coming to consult us on a project."[72]

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[64] A safety case is a document produced by the operator of a facility that identifies the hazards and risks, describes how the risks are controlled, and describes the safety management system in place to ensure the controls are effectively and consistently applied.

[65] https://www.canada.ca/en/services/environment/conservation/assessments/environmental-reviews/environmental-assessment-processes/building-common-ground.html#_Toc002

[66] https://www.cbc.ca/news/canada/newfoundland-labrador/deepwater-horizon-commissioner-comparisons-to-nl-1.5253251

[67] https://www.govinfo.gov/content/pkg/GPO-OILCOMMISSION/pdf/GPO-OILCOMMISSION.pdf

[68] https://laws-lois.justice.gc.ca/eng/acts/C-7.5/

[69] Carter, Angela. 2020. "Fossilized : Environmental Policy in Canada's Petro-Provinces." UBC Press.

[70] Fusco, Leah. "The Invisible Movement: The Response of the Newfoundland Environmental Movement to the Offshore Oil Industry." Memorial University, 2007, p. 87-97.

[71] Shrimpton, Mark, Boris de Jonge, Lucia McIsaac, and Sean Cadigan. "Atlantic Canada Offshore Petroleum Exploration Rights Permitting Study." St. John's: Atlantic Canada Petroleum Institute, 2003, p. 20.

[72] https://thenarwhal.ca/newfoundland-oil-gas-federal-oversight/

While there is no doubt that oil companies and Canadian regulators take safety very seriously, the industry is attempting increasingly technically ambitious operations and companies are expanding their operations to new, often environmentally sensitive areas, where a significant amount of exploration drilling may be required, which entails the highest risk of blowout.[73] Moreover, tolerable levels of risk for government regulators and companies may not align with those of potentially impacted local communities. Whether the Boards are well-suited to their role as the lead regulator on offshore environmental matters is an essential and pressing question that is not reflected in the Framework Regulations, despite the fact that it is the regulators who will be interpreting and enforcing increasingly performance-based concepts such as ALARP found within these regulations.

Recommendation #4: Remove liability limits for offshore operators

Comment/Problem: The current design of Canada's liability rules for offshore oil operations potentially leaves governments, taxpayers, and communities vulnerable to clean up costs above $1 billion in the event of a significant accident or spill.

Recommendation: Unlimited financial and environmental liability, even in the case of unforeseeable events, would help to ensure that companies take every necessary precaution to prevent accidents from occurring and is consistent with the 'polluter pays' principle. Operators must also be able to prove to the regulator that they have the financial capacity to pay for the full amount of clean-up costs and all associated damages.

Re: Administrative Monetary Penalties Regulations

Overview

The proposed annexed regulations amending the Administrative Monetary Penalty Regulations under the Accord Acts provide the CNSOPB with the authority to issue fines to regulated operators for enforcement purposes. These penalties, established under the 2014 *Energy Safety and Security Act*, are set at $1 billion in absolute liability (no fault). Other countries do not have caps on liability, regardless of fault, yet this has not discouraged interest or investment in offshore drilling. $1 billion in absolute liability is too low to cover the costs associated with catastrophic spills especially in the North Atlantic where environmental conditions would frustrate spill response efforts.

Rationale

In February 2016, amendments to the Administrative Monetary Penalty Regulations under the Accord Acts, came into force, which provided the CNSOPB with the authority to issue administrative monetary penalties (AMPs) to regulated operators for enforcement purposes.

[73] https://officerofthewatch.com/2013/08/06/the-probability-of-an-offshore-accident/

The 2014 *Energy Safety and Security Act* (ESSA) introduced changes to the liability regimes governing Canada's offshore oil and gas industries. These changes increased the amount of security required to be provided to $100 million, raising the cap on absolute, or no-fault, liability from $30 million to $1 billion and empowering offshore regulators to issue administrative monetary penalties. This allows regulators to determine the amount of security, with no set minimum, that an operator will be required to post in order to undertake exploration activities. The amendments set a minimum $100 million of security, which the CNSOPB may exceed at its discretion. However, regulators must appeal to the courts in order to impose fines and penalties on parties that contravene the statutes and regulations.

The current design of Canada's liability rules for offshore oil operations potentially leaves governments, taxpayers, communities and the environment vulnerable in the event of a significant accident or spill. Absolute liability ("without proof of fault or negligence") is capped at $1 billion CAD; however, liability is unlimited when operator negligence is proven. In line with the polluter pays principle, liability should be commensurate with the entire potential costs of a catastrophic accident, regardless of fault. This principle, as it has been defined by the Supreme Court of Canada, "assigns polluters the responsibility for remedying contamination for which they are responsible and imposes on them the direct and immediate costs of pollution."[74] This principle is encouraged in Principle 16 of the 1992 Rio Declaration, which Canada signed, and the 2009 Arctic Council Guidelines.[75]

The liability regime for drilling operations conducted in the Nova Scotia offshore is established pursuant to the *Offshore Area Oil and Gas Operations Regulations*[76] (to be repealed and replaced), the *Offshore Petroleum Administrative Monetary Penalties Regulations*[77] and the *Offshore Petroleum Cost Recovery Regulations*.[78] Liability limits not only shape and limit any claims for post-spill compensation, but they can also create an incentive for oil companies to pursue excessively risky activities, knowing they will only bear the full cost of liability (beyond the absolute liability cap) if fault or negligence is established and upheld in court. Essentially, they are a form of public subsidy to the oil industry, since potential costs above the limit need not be factored into insurance costs, and therefore do not necessarily figure in assessments of the economic viability of a potential project. An appropriate liability regime can decrease the risk of environmental harm by rewarding improved industry safety practices.

If a possible hazard has been identified and ignored, or if insufficient precautions were taken, the operator would certainly be considered negligent and liability would be absolute. However, oil and gas drilling operations in extreme and unpredictable environments such as the North Atlantic can encounter many potential events and hazards, some of which may be considered reasonably "foreseeable" by the courts, while others may not. If a serious accident were to take place as the result of a *force majeure* (chance occurrence or unavoidable accident), it is conceivable that the government (i.e., taxpayers) would be liable for clean-up costs above $1 billion as per the existing liability rules.

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[74] Imperial Oil Ltd v Quebec (Minister of the Environment), 2003 SCC 58 at para 24, [2003] 2 SCR 624 [Imperial Oil].
[75] United Nations. 1992. Rio Declaration on Environment and Development. https://www.jus.uio.no/lm/environmental.development.rio.declaration.1992/portrait.a4.pdf
[76] https://assembly.nl.ca/Legislation/sr/Regulations/rc960001.htm
[77] https://assembly.nl.ca/Legislation/sr/Regulations/rc160005.htm
[78] https://assembly.nl.ca/Legislation/sr/Regulations/rc160006.htm

At first glance, $1 billion appears to be a large sum, particularly in light of the previous $40 million limit.[79] However, the 2010 Deepwater Horizon blowout in the Gulf of Mexico is reported to have cost $62 billion in damages, and some studies have estimated the actual cost at $145 billion.[80] It is quite likely that a major spill in the extreme and remote Atlantic offshore environment would be almost impossible to clean up, with potentially devastating impacts on the marine environment and the livelihoods of local communities. The burden of proof would be on the Canadian government, Indigenous organizations or individuals and small communities with limited financial means to prove that an oil company was at fault for accidents exceeding $1 billion in clean-up costs and damages.

If the liability legislation was intended to enforce the polluter pays principle, then liability caps run contrary to this, given that major spills could cost far more than $1 billion. At the time of its introduction, the government argued that the cap was intended to protect companies and even their insurers from going bankrupt. It was further argued that liability beyond this amount would be limited by bankruptcy legislation in any event, thus the cap is necessary to protect jobs in both oil and gas operators and insurers themselves. Therefore, under Canada's Financial Responsibility Requirements, an operator is not required to provide proof that has a minimum of $1 billion in assets and has the financial resources to pay for the entire amount of at-fault liability above this amount.

This is an obvious weakness in the legislation. A regulator should be able to assess, before issuing a work permit, whether a company has the financial means to cover all the potential clean-up, damages and liability costs of a worst-case scenario incident. This would ensure that a potential polluter has the ability to pay for any and all potential damages. Even under Canada's current liability cap, a company would still be held fully liable without limit if negligence is proven in court. If a company does not have the financial means, it should not be operating in the high-risk Atlantic offshore environment, period. [81]

Other countries do not have caps on liability, regardless of fault, yet this has not discouraged interest or investment in offshore drilling. In Norway, operators are liable for all pollution damages, although liability can be reduced at the discretion of the government.[82] The U.K., Russia and Greenland also utilize unlimited liability for offshore oil and gas operators, meaning there is no cap on liability for offshore drilling and the operator is liable for pollution damage without regard to fault.

The Energy Safety and Security *Act* included a number of fundamental weaknesses that have not been addressed in the Framework Regulations and compromise the *Act*'s effectiveness in terms of improving safety practices and protecting Canadian taxpayers in the event of a catastrophic spill:

1. $1 billion in absolute liability is too low to cover the costs associated with catastrophic spills especially in the North Atlantic where environmental conditions would frustrate spill response efforts;

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

[80] Lee, Y. G., Garza-Gomez, X., & Lee, R. M. (2018). Ultimate Costs of the Disaster: Seven Years After the Deepwater Horizon Oil Spill. *Journal of Corporate Accounting & Finance*, *29*(1), 69–79. https://doi.org/10.1002/jcaf.22306

[81] The Arctic Council (2009) recommends that operators "demonstrate financial capacity to carry out all aspects of the operation, including responding to environmental emergencies and decommissioning of facilities."

[82] Norwegian Petroleum Act, section 7(3).

2. The bill provides for ministerial discretion to reduce absolute liability levels to below the legislated level of $1 billion;

3. The bill provides relief from liability, in certain cases, for the effects of dumping toxic spill treating agents (chemical dispersants) into marine environments;

4. The bill does not require an operator to provide proof that it has the financial resources to pay for the entire amount of at-fault liability.

Eliminating the $1 billion liability cap and ensuring that operators have the financial capacity to pay the full amount of clean-up costs and damages are two major reforms that will go a long way toward ensuring that companies weigh the full potential liability and make better risk decisions. Removing the cap, as other countries have done, would transfer the respective liabilities to those companies that wish to operate in the offshore. Unlimited absolute liability will ensure the appropriate allocation of risk, which will provide an incentive for industry to improve safety practices, thereby reducing the likelihood of polluting accidents; and it will ensure that taxpayers are entirely protected from the financial consequences of an offshore oil spill, which could run into the tens of billions of dollars.

Financial Responsibility

Smaller oil companies may have trouble even paying the $1 billion absolute liability, let alone if there was no absolute liability cap and they were responsible for all the clean-up costs. All countries require some demonstration, to varying degrees, of the operator's ability to take financial responsibility and/or demonstrate reserves, such as sufficient insurance, in the event of an oil spill; however, as noted there is no legal requirement in Canada for operators to demonstrate financial capacity or insurance to cover liabilities up to a realistic level.

Greenland has been showing some leadership on this issue, demanding that oil companies provide a $2 billion guarantee in advance of exploratory drilling. Smaller companies are required to provide the money up front, with the "bond" being designated specifically for meeting the cleanup costs resulting from any spill.[83] The licensee must provide a financial guarantee of $10 billion USD, which is an improvement upon Canada's absolute liability cap but still insufficient. In the U.K., in order to be satisfied that an operator is in a position to implement its plan, the Department of Energy and Climate Change must also be satisfied that the operator (together with its partners) has appropriately estimated the possible costs of implementing these steps and has in place the funds to do so.[84]

[83] Tim Webb, "Greenland wants $2bn bond from oil firms keen to drill in its Arctic waters," The Guardian, 12 November 2010, available at http://www.guardian.co.uk/business/2010/nov/12/greenland-oil-drilling-bond

[84] U.K. Department of Energy and Climate Change, Oil Pollution Emergency Plan Requirements, 2009, https://www.og.decc.gov.uk/environment/OPEP_Guidance.doc

Recommendation #5: Include climate risk analysis in the impact assessment process

Comment/Problem: Decisions about whether to allow offshore oil and gas activities can be made without accounting for the climate crisis, the urgent need to transition to renewable sources of energy or a holistic view of activities happening in Canada's oceans.

Recommendation: The Framework Regulations should include a climate test to ensure that oil and gas production is consistent with national and global climate goals.

Re: Part 6

Drilling and Production

Capture or venting of emissions

83(2) *The operator must ensure that the emissions of gas from the seals of a centrifugal compressor or reciprocating compressor at an installation are*

- ***(a)*** *captured and routed to gas conservation equipment or gas destruction equipment; or*
- ***(b)*** *routed to vents that release those emissions into the atmosphere.*

Measure of flow rate of emissions

(3) *The operator must ensure that the flow rate of emissions of gas released from vents referred to in paragraph (2)(b) is measured by means of a continuous monitoring device.*

Summary

The Framework Regulations only consider emissions of gas and continue to allow the CNSOPB to make decisions about whether and under what conditions offshore oil and gas activities can be carried out without accounting for climate change and the widely accepted need to reduce greenhouse gas emissions. The regulator is not obligated to recommend the rejection of a project that is inconsistent with national or provincial climate commitments or has an inadequate strategy to minimize or eliminate greenhouse gas emissions.

Rationale

Currently, although climate change is included as one of the primary factors that must be considered when the IAAC makes a decision on whether to approve a project, there is no "climate test" in Canadian legislation to ensure that development is compatible with national and international climate targets, both in terms of upstream emissions (oil extraction and production) as well as downstream (burning of the oil and gas by end users). Decisions about

whether and under what conditions to allow offshore oil and gas activities can be made without fully accounting for compatibility with climate targets and the urgent need to transition to renewable sources of energy. The regulator is not obligated to recommend the rejection of a project that is inconsistent with climate commitments.[85] What's more, there is no trigger to ensure projects receive an impact assessment based on climate impacts and no requirement to consider the "downstream" climate impacts of a project when the oil is ultimately burned, which by some estimates would increase upstream emissions from production by up to ten times.[86] [87]

The world's energy transition is driven by the global consensus that to avoid disaster, the Earth's overall rise in temperature must be no more than 2°C, according to the Paris Agreement, with a safer aspirational target of 1.5°C.[88] However, carbon emissions from the full production of currently operating oil and gas fields and coal mines across the world will almost certainly lead to global temperature rise beyond 2°C. To stay within this target, studies indicate that 68-80 percent of existing global fossil fuel reserves must stay in the ground.[89]

Development of undiscovered and expensive oil and gas resources in the North Atlantic is very likely not commensurate with the 2°C goal, let alone the 1.5°C target.[90] To the extent that nations choose not to abide by this commitment, the outcome for the world will be devastating.[91]

In 2019, the government of Canada released Physical Activities Regulations in support of the new Impact Assessment *Act*. As noted, these regulations do not require a "climate test" as part of the impact assessment process. In other words, despite the apparent incompatibility of North Atlantic oil with global climate targets and the government's stated commitment to ensure that oil and gas activities must be consistent with national and global climate goals, an emissions assessment of proposed offshore projects is not required by law. Climate is also not one of the factors used to determine whether a project will cause significant environmental effects. In contrast, Greenland's Mineral Resources Act sets out specific rules regarding environmental protection and liability. Pursuant to section 56, the Greenland Government must attach importance to, for example, the consideration for avoiding impairment or any other negative impact on the climate when it makes a decision on the granting of a licence under the *MRA*.

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[85] https://y2y.net/publications/science-in-the-iaa-tech-report-report-card.pdf/

[86] Climate Accountability Institute. 2017. The Carbon Majors Database: CDP Carbon Majors Report 2017.

[87] Lee, M. 2017. Extracted Carbon: Re-examining Canada's Contribution to Climate Change through Fossil Fuel Exports. *Canadian Centre for Policy Alternatives*, p.5. https://www.policyalternatives.ca/publications/reports/extracted-carbon

[88] United Nations Climate Change. The Paris Agreement. https://unfccc.int/process-and-meetings/the-paris-agreement/the-paris-agreement

[89] See Carbon Tracker Initiative. 2011. Unburnable Carbon – Are the world's financial markets carrying a carbon bubble? https://www.carbontracker.org/reports/carbon-bubble/; M. Raupach et al. 2014. Sharing a quota on cumulative carbon emissions. *Nature Climate Change* 873; Oil Change International. Sept. 2016. The Sky's Limit: Why the Paris Climate Goals Require A Managed Decline of Fossil Fuel Production. (http://priceofoil.org/2016/09/22/the-skys-limit-report/

[90] McGlade, C. and Ekins, P. 2015. The geographical distribution of fossil fuels unused when limiting global warming to 2° C, 517 Nature 187.

[91] Intergovernmental Panel on Climate Change. 2018. Global Warming of 1.5 °C: Special Report on the impacts of global warming of 1.5 °C above pre-industrial levels and related global greenhouse gas emission pathways, in the context of strengthening the global response to the threat of climate change, sustainable development, and efforts to eradicate poverty. http://www.ipcc.ch/report/sr15/

Canada has no such requirements. In fact, following the Regional Assessment of Offshore Oil and Gas Exploratory Drilling East of Nova Scotia, many offshore exploration projects in the region will now be exempt from any evaluation of potential environmental impacts, including climate impacts.

GHG emissions from a single, average offshore platform are estimated by Environment and Climate Change Canada to be roughly one-half megatonne (500,000 tonnes) per year in the Atlantic offshore,[92] which is roughly equivalent to putting an additional 100,000 passenger vehicles on Canadian roads.[93] Again, this does not include downstream emissions when the extracted oil and gas is burned, which increases the total carbon footprint by up to 1000%.[94] [95]

Reducing greenhouse gas emissions and achieving carbon neutrality by 2050 will require a fundamental change in the manner in which Canada and the global community develops and uses energy. Full consideration of whether, and under what circumstances, the federal government allows the extraction and burning of offshore oil and gas must be part of that change.

Recommendation #6: Prohibit oil and gas in ecologically or culturally significant areas.

Comment/Problem: The Framework Regulations do not prevent drilling or seismic testing in ecologically and biologically significant areas, nor in high-risk or culturally important areas.

Recommendation: In keeping with the Precautionary Principle and with the express consent of Indigenous rights holders, areas identified as high-risk, ecologically and biologically significant, or culturally important must be placed off-limits to oil and gas activities. This includes sensitive benthic areas, Marine Protected Areas, marine refuges and critical habitat for species at risk.

Summary

The Framework Regulations include no mention of drilling in ecologically or culturally sensitive areas. There are no requirements for operators to avoid these areas. WWF-Canada requests again that the Framework Regulations prohibit oil

[92] ECCC GHGRP. 2018. *Greenhouse Gas Reporting Program.* Environment and Climate Change Canada. Available at: https://climate-change.canada.ca/facility-emissions/, version 1.0.6656.24545
[93] U.S. Environmental Protection Agency. Greenhouse Gas Equivalencies Calculator. https://www.epa.gov/energy/greenhouse-gas-equivalencies-calculator
[94] Climate Accountability Institute. July 2017. The Carbon Majors Database: CDP Carbon Majors Report 2017. https://b8f65cb373b1b7b15feb-c70d8ead6ced550b4d987d7c03fcdd1d.ssl.cf3.rackcdn.com/cms/reports/documents/000/002/327/original/Carbon-Majors-Report-2017.pdf?1499691240
[95] U.S. Environmental Protection Agency. Greenhouse Gas Equivalencies Calculator. https://www.epa.gov/energy/greenhouse-gas-equivalencies-calculator

and gas activities within protected areas and other areas that aim to protect important benthic habitats, conserve biodiversity and uphold Canada's commitments to marine conservation under the North Atlantic Fisheries Organization (NAFO).

Rationale

The North Atlantic has sensitive and unique ecosystems that are vulnerable to disturbance and are not well-studied, and some communities are dependent on a healthy marine environment for their subsistence, as well as their social, spiritual and cultural well-being. Ecologically and biologically significant areas (EBSAs) are regions within Canada's oceans that have been identified through formal scientific assessments as having special biological or ecological significance. Identification of EBSAs is based on the biological and ecological properties of an area and does not consider threats and risks to those sites; however, due to their importance, they are managed with a greater degree of risk aversion.[96]

The challenges associated with drilling in the North Atlantic - extreme weather, limited visibility, sea ice, significant geographic distances, and limited environmental response equipment – mean that the industry may be attempting increasingly technically ambitious operations, usually in deep water, with extremely limited response capacity in difficult conditions. A significant amount of seismic airgun surveys and exploration drilling may be required, which is the drilling phase that entails the highest risk of blowout.[97]

Given the potentially catastrophic consequences associated with a major spill, areas identified as high risk (e.g. presence of summer sea ice, extreme weather conditions, deep water) or as having significant ecological, biological or cultural importance must be excluded from seismic airgun surveys and offshore exploration or production activities, without the express consent of Indigenous rights holders. [98] This includes EBSAs, sensitive benthic areas, Marine Protected Areas, marine refuges and critical habitat for species at risk, as identified under Canada's Species at Risk *Act*.[99]

[96] Department of Fisheries and Oceans Canada. 2004. Identification of Ecologically and Biologically Significant Areas. DFO Can. Sci. Advis. Sec. Ecosystem Status Rep. 2004/006.
[97] https://officerofthewatch.com/2013/08/06/the-probability-of-an-offshore-accident/
[98] Weilgart, L. 2019. Best Available Technology and Best Environmental Practice for Three Noise Sources: Shipping, Seismic Airgun Surveys and Pile Driving. The Journal of Ocean Technology. Vol. 14, No. 3. 1-9.
[99] https://laws-lois.justice.gc.ca/eng/acts/s-15.3/

Recommendation #7: Strengthen evidence-based rules for seismic testing programs

Comment/Problem: The Framework Regulations are insufficient to ensure the safety of marine wildlife when conducting underwater seismic blasting operations and they are not consistent with the current state of scientific knowledge of the impacts of underwater noise.

Recommendation: Strengthen evidence-based rules for seismic programs and require "best available and safest technology" (BAST) alternatives that are less harmful to marine wildlife. More research is needed on the effects of seismic airgun noise on marine mammals and on the abundance and distribution of marine wildlife.

Re: Part 5 (Geoscientific Programs, Geotechnical Programs and Environmental Programs):

- **(a)** all equipment and materials that are necessary to conduct a geoscientific program, geotechnical program or environmental program are handled, installed, inspected, tested, maintained and operated taking into account the manufacturer's instructions and industry standards and best practices;

Summary

In place of "best practices", the Framework Regulations should explicitly require the use of the "Best Available and Safest Technologies" (BAST) in part 5 of the Framework Regulations regarding the use of seismic programs. Much of the prescriptive language pertaining to equipment for geophysical testing (i.e., seismic programs) has been removed in favour of an overreliance on performance-based standards that require equipment simply to be "maintained and operated taking into account the manufacturer's instructions." While the importance of diver safety is mentioned, there is no mention of the safety of marine wildlife and the risks that seismic testing programs can pose to the marine environment. A BAST requirement would not prescribe the use of specific technologies but would require that safer alternatives be used whenever possible.

Rationale

Significant gaps in knowledge exist regarding the effects of seismic air gun noise on marine mammals,[100] and we do not yet have sufficient information on the abundance and distribution of some marine wildlife in the North Atlantic region.[101] Baseline studies of biological abundance and distribution must occur at least a year, preferably two, in advance of any seismic surveys, as

[100] Gordon et al. 2003.
[101] Weilgart, 2019.

we have a legitimate reason to expect negative impacts severe enough to impact the health, welfare, and sustainability of at least some animal populations, from plankton through fish to whales.

The most effective mitigation measures for seismic air gun surveys are:

- remove the surveys from areas/seasons rich in marine life and sensitive species
- lower the source level (quiet the noise)
- require the use of air gun alternatives such as Marine vibroseis (MV), which can drastically cut noise levels and limit the frequencies (pitches) of noise output.

The Statement of Canadian Practice with respect to the Mitigation of Seismic Sound in the Marine Environment specifies the mitigation requirements that must be met during the planning and conduct of marine seismic surveys.[102] The *Statement* applies to all seismic activities in the marine environment that use air source arrays. For seismic surveys conducted for the purpose of oil and gas exploration, the *Statement* is administered by the existing oil and gas regulatory bodies (i.e., the CNSOPB in this case).

Unfortunately, the provisions in the *Statement* are insufficient to ensure the safety of marine wildlife when conducting underwater seismic blasting operations. Moreover, part 5 of the Framework Regulations places far too much emphasis on performance-based standards in regulating geophysical activities when scientifically proven minimum standards and the precautionary approach would be much more effective in protecting the marine environment from excessive underwater noise.

Underwater noise from vessel traffic can readily propagate over 100 kilometers and the noise from seismic surveys can be heard almost continuously in some areas for distances of up to 4,000 km as seismic air gun surveys are among the loudest of human produced sounds, and sound travels very fast and efficiently in water.[103] Although there is a general dearth of noise impact studies from the North Atlantic region, the science to date clearly suggests that there can be serious negative effects from seismic testing on some important species, including plankton, benthic organisms, whales, harbour porpoises, dolphins, invertebrates including squid, and fish. These impacts can linger for months or even a year after the surveys have ceased. To date, roughly 130 species have been documented to be impacted by human-caused underwater noise pollution,[104] and while more research is needed, we know enough from studies so far, especially those involving seismic air gun surveys, to conclude that anthropogenic underwater noise is a serious and transboundary pollutant, which can degrade huge ocean areas and do harm to marine ecosystems.

A 2015 report by Marine Conservation Research on the impacts of seismic testing on whales concluded that "It is indisputable that seismic noise has adverse impacts on marine life…From the research at hand, it is clear that noise from seismic activity impacts whales. It can damage their hearing, ability to communicate, disrupt diving behavior, feeding and migration patterns.

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[102] https://waves-vagues.dfo-mpo.gc.ca/Library/363838.pdf

[103] Nieukirk, S. L., Mellinger, D. K., Moore, S. E., et al. (2012). Sounds from airguns and fin whales recorded in the mid-Atlantic Ocean, 1999–2009. Journal of the Acoustical Society of America, 131, 1102–12.

[104] Weilgart, L., 2018. *The impact of ocean noise pollution on fish and invertebrates*. Report for OceanCare, Switzerland.

There are increasing indications that this could cause serious injury to whales. It may also disrupt reproductive success and increase the risk of strandings and ice entrapments."[105] Notably, the report also concluded that there is a massive research gap in this field and that decision-makers should use "extreme caution" before allowing seismic activity.

As Weilgart (2018) summarized, for some species and in certain situations, the weaker the behavioural response, the more serious the impact on the population.[106] Individuals with lower energy reserves or no alternative habitat cannot afford to flee repeatedly from disturbance but are forced to remain and continue feeding, apparently unresponsive to disruption.[107] [108] Yet these individuals are in fact more vulnerable to disturbance. Animals do not always react in an outwardly observable or obvious manner even if they are seriously impacted.[109]

There are known, safer alternatives to seismic testing such as MV, which must be encouraged or required whenever possible.[110] Penetration into the seafloor is largely a function of sound frequency, and MV can produce the same well-penetrating, low frequencies as airguns and send sound waves just as deeply into the seafloor as airguns.[111] Moreover, MV is a controlled source and as such, the source characteristics (frequency, duration, type of sound) can be altered in real-time, to optimize the output for each environment and situation. This technology is less environmentally impactful, as the unnecessary high frequencies that airguns emit (up to 100,000 Hz), are not used by MV. Frequencies over about 150 Hz are not recorded or used by the oil and gas industry. Thus, a great deal of energy is emitted by airguns that is wasted. The high frequencies that airguns emit can unnecessarily disturb species such as narwhals, belugas, northern bottlenose whales, and harbour porpoises. MV is much quieter, both near the source and at distance.[112] Researchers have estimated that a MV survey would expose only about 1-20% of whales and dolphins to high noise levels when compared to those exposed to an airgun survey, based on their models.[113] MV is roughly one-thousand times quieter than traditional seismic airguns and does not have a "shot-like" quality, something that is particularly injurious to living tissues.

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[105] https://www.greenpeace.org/usa/wp-content/uploads/2015/08/A-Review-of-the-Impact-of-Seismic-Survey-Noise-on-Narwhal-and-other-Arctic-Cetaceans-.pdf

[106] Weilgart, 2018.

[107] Gill, J.A. et al. 2001. Why behavioural responses may not reflect the population consequences of human disturbance. *Biological Conservation* 97 (2001) 265-268. http://citeseerx.ist.psu.edu/viewdoc/download?doi=10.1.1.546.453&rep=rep1&type=pdf

[108] Stillman, R.A. & Goss-Custard, J.D. 2002. Seasonal changes in the response of Oystercatchers Haematopus ostralegus to human disturbance. *J. Avian Biol*. 33: 358–365. http://obpa-nc.org/DOI-AdminRecord/0064594-0064602.pdf

[109] Bejder, L. et al. 2006. Decline in relative abundance of bottlenose dolphins exposed to long-term disturbance. Conservation Biology. 20(6). 1791-98.

[110] Weilgart, L. (2016). Alternative Quieting Technology to Seismic Airguns for Oil and Gas Exploration and Geophysical Research. Brief for GSDR – 2016 Update.

[111] Ibid.

[112] Duncan, A.J., Weilgart, L.S., Leaper, R., Jasny, M. and Livermore, S., 2017. A modelling comparison between received sound levels produced by a marine Vibroseis array and those from an airgun array for some typical seismic survey scenarios. *Marine Pollution Bulletin*, *119*(1), pp.277-288.

[113] LGL & MAI. 2011. Environmental Assessment of Marine Vibroseis. LGL Rep. TA4604-1; JIP contract 22 07-12. Rep. from LGL Ltd., environ. res. assoc., King City, Ont., Canada, and Marine Acoustics Inc., Arlington, VA, U.S.A., for Joint Industry Programme, E&P Sound and Marine Life, Intern. Assoc. of Oil & Gas Producers, London, U.K. 207 p.

The mitigation options that currently exist to minimize seismic impacts are largely unproven in their effectiveness. For instance, ramp-ups or soft starts, where the number of air guns firing are gradually and audibly increased, do not appear to be consistently and reliably effective in causing humpback whales to move away from the source vessel.[114] There is large variation in whale behavior, with some groups swimming away from the sound source whereas others approached even relatively loud noise levels, possibly viewing them as a challenge that needed to be confronted. Whales that did avoid the (source) vessel emitting air gun noise may have avoided the vessel itself, not the noise.[115] Although the sound source was different (naval sonar vs. seismic air guns), and the ramp-up procedures are different, gradually increasing the sonar source intensity has been found not to be an effective method to reduce the risk of physiological effects for humpback whales overall, mainly because most whales did not exhibit very strong avoidance responses to the sonar signals.[116] Animals that had not been exposed to sonar recently, were not feeding, or were with a small calf were more responsive. This again illustrates how difficult it is to form conclusions about innocuous noise impacts since whales, but also fish, show great variation in their behavior in the wild. Moreover, when animals have a strong motivation not to move away from their current location, ramp-ups are unlikely to be effective.

"Shut down zones" when a marine mammal is sighted is also a problematic mitigation measure. Ensuring operator compliance with a "shut down zone" rule is not straightforward and research suggests that the required 500-metre radius in the Statement of Canadian Practice with respect to the Mitigation of Seismic Sound is insufficiently small to adequately protect marine mammals from seismic impacts. There is no consensus regarding what constitutes a "safe" exposure as the safety radius is highly dependent on the sound transmission conditions which change with bathymetry, nature of the seafloor, and the sound speed profile which can change between seasons. Impacts from air guns also can vary based on past exposure, recovery time, species, age and sex, as well as context.[117]

Even if it were possible to determine a safe 'shut down zone' radius, it can be extremely difficult for marine mammal observers on board seismic vessels to detect marine wildlife within that zone. Survey activities often take place at night or in other limited-visibility conditions and many marine mammals and turtles are hard to sight as they are cryptic, elusive and often underwater.[118] Most whales are rarely visible at the surface, especially the deep divers (Northern bottlenose whales) and especially in anything but perfect visibility. Quantitative analysis has shown that mitigation monitoring detects fewer than 2% of beaked whales (e.g. Northern bottlenose whales) even if the animals are directly in the path of the ship.[119] Other species might be slightly easier to sight, but monitoring cannot be relied upon to be satisfactorily effective.

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[114] Dunlop, R.A. et al. 2017. Response of humpback whales to ramp-up of a small experimental airgun array. *Marine Pollution Bulletin*. 103: 1-2.

[115] Ibid.

[116] Wensveen et al. 2017. Lack of behavioural responses of humpback whales indicate limited effectiveness of sonar mitigation. Journal of Experimental Biology. 220(22): 4150-4161.

[117] Gordon, J. et al. 2003. A Review of the Effects of Seismic Surveys on Marine Mammals. *Marine Technology Society Journal.* 37(4): 16-34

[118] Weilgart, 2019.

[119] Barlow, J. and Gisiner, R. 2006. Mitigating, monitoring and assessing the effects of anthropogenic sound on beaked whales. *Journal of Cetacean Research and Management*, *7*(3), pp.239-249.

The most effective mitigation measure for seismic air guns is simply to prohibit their use, particularly when safer alternatives are known to exist. At a minimum, air gun surveys should be separated from areas rich in marine life and sensitive species, and the source level should be lowered (i.e., quiet the noise), but these measures are not currently required under the Framework Regulations.

The long-term impacts of seismic testing, together with threats such as climate change and ocean acidification, on the ecosystem and population biology should be thoroughly studied. Such studies are very challenging to carry out, but the burden of proof (to show no harm) should be on the project proponent, who wishes to alter the environment, rather than those wishing to preserve it. In the meantime, Canadian regulations must require the use of alternatives to air guns whenever possible, such as MV, which are proven to be less harmful to marine wildlife. Seismic air gun surveys clearly degrade the marine environment and impact the health of many species' populations, which northern communities depend upon for their survival, culture and livelihoods. These surveys need to be regulated accordingly.

Recommendation #8: Vastly improve oil spill response capacity

Comment/Problem: There are no requirements to ensure that a major oil spill could be cleaned up quickly and effectively.

Recommendation: The Framework Regulations must ensure effective and efficient oil response capacity. Immediate steps, including substantial investment, must be taken to provide adequate response capabilities and infrastructure support.

Re: Part 2

Contingency plan

12 (1) An operator must develop a contingency plan that sets out the procedures (including emergency response procedures), practices, resources and monitoring measures that are necessary to effectively prepare for and mitigate the effects of any accidental event.

12 (4) If a spill-treating agent is being considered for use as a spill response measure, the contingency plan must include the following additional documents and information:

> *(a) the name of the chosen spill-treating agent and an assessment of its efficacy in treating the potential sources of pollutants, including the results of any tests conducted for the assessment and a description of those tests;*
>
> *(b) the results of an analysis that demonstrates that a net environmental benefit is likely to be achieved through the use of the spill-treating agent under certain circumstances;*
>
> *(c) a description of the circumstances under which the spill-treating agent will be used and the estimated period within which the use of that spill-treating agent will be effective;*
>
> *(d) a description of the methods and protocols, including the amount and application rate, for safe, effective and efficient use of the spill-treating agent;*

(e) the international standard or alternative recognized by the Board on which the spill-treating agent assessment, analysis and the methods and protocols referred to in paragraphs (a) and (b) are based, taking the local environment into account;

(f) a list of the personnel, equipment and materials that an operator will have available for the use of the spill-treating agent in spill response operations and the details of any contractual arrangements for that personnel and equipment and those materials; and

(g) a monitoring plan for the use of the spill-treating agent.

Summary

Once again, rather than requiring only that the operator "set out" emergency response procedures and that the spill treating agent be named, the Framework Regulations should explicitly require the use of the 'Best Available and Safest Technologies' to help ensure that a major spill could be cleaned up and that the safest, most effective spill treating agent be used based on regional conditions and the best available science. The industry's agent of choice, Corexit, can be toxic, sometimes more so than oil, and cold weather and the presence of ice can make it difficult to apply.

Rationale

It is likely that a major spill in the North Atlantic would have potentially devastating impacts to the marine environment and to communities in the region, who depend on healthy and clean marine waters. There are no actual legal requirements in Canada to ensure that sufficient people and equipment could respond to a spill from a drilling rig or a ship, nor any obligations to ensure that such a response would occur within the time frame required by law.

Oil spill response in the region is challenging because of extreme weather, sea ice and environmental conditions, periods of prolonged darkness, and significant geographic distances. Remote locations mean response times for large-scale cleanup can be much longer than in temperate latitudes. Rain, blowing snow, fog, gale-force winds and prolonged periods of darkness limit visibility. A 2016 report by Nuka Research entitled '*Estimating an Oil Spill Response Gap for the U.S. Arctic Ocean'* shows that oil controlling booms start to lose their effectiveness in metre-high waves and stop working entirely when the waves reach two metres high.[120] Simply put, there is currently no method that has been proven effective and reliable in dealing with major oil spills in the extreme environmental conditions common to the North Atlantic.

Oil Spill Dispersants

There are regulations in Canada that control the type and use of oil spill dispersants. They require an authorization from the CNSOPB once a Spill Impact Mitigation Assessment (SIMA) has been conducted to determine if they should be used. The application of chemical dispersants

[120] http://nukaresearch.com/download/projects/estimating-an-oil-spill-response-gap-for-the-us-arctic-ocean-revised.pdf

such as Corexit can be toxic, sometimes more so than oil, and cold weather and the presence of ice can make it difficult to apply dispersants to oil slicks, as dispersants rely on ocean waves to mix the oil and chemicals together. As one of several response techniques, the use of chemical dispersants may be necessary in certain circumstances, however, their use must be a last resort, produce a net environmental benefit and must be constrained by socioeconomic and environmental considerations.

The environmental rationale for attempting to chemically disperse spilled oil is that removing the oil from the water surface and driving it into the water column as suspended droplets could prevent damage to shorelines, seabirds and marine mammals. The practical problem with this idea is that it can only work if a very high fraction of the oil can be driven into the water column. Otherwise, enough oil will remain on the surface to contaminate shorelines in spite of the dispersant application. It should also be noted that there are trade-offs involved in moving oil from the surface to the water column.

The potential ecological consequences of the physical and toxicological properties of dispersed oil are far from fully understood. One recent study found that, given the potential for toxic chemical dispersants to cause environmental damage by increasing oil bioavailability and toxicity while suppressing its biodegradation, unrestricted dispersant application in response to deep-sea blowouts is highly questionable and more research is required to inform response plans in future oil spills.[121] What is clear, however, is that broadcasting dispersants can compound the ecological damage of oil spills. The impacts to plankton communities, which are the foundation of marine food webs and the impacts to the seabed are detrimental.[122] Hence the use of dispersants has socioeconomic consequences as well as environmental and there are still many unknowns about their use.

Chemical dispersants should never be used in sensitive environments and, in any case, would be limited in effectiveness even when they are used. Once again, given the difficulty in adequately responding to an oil spill in the North Atlantic, emphasis should be placed, from a regulatory perspective, on the avoidance and prevention of accidents.

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[121] Paris, C. B. et al. 2018. BP Gulf Science Data Reveals Ineffectual Subsea Dispersant Injection for the Macondo Blowout. *Frontiers in Marine Science*. November 2018.

[122] Buskey, E., H. White, and A.J. Esbaugh. 2016. Impact of Oil Spills on Marine Life in the Gulf of Mexico: Effects on Plankton, Nekton, and Deep-Sea Benthos. *Oceanography* 29(3): 174-181. https://www.researchgate.net/publication/307518241_Impact_of_Oil_Spills_on_Marine_Life_in_the_Gulf_of_Mexico_Effects_on_Plankton_Nekton_and_Deep-Sea_Benthos

5. Required legislative and regulatory changes

The following table connects the regulatory changes recommended in this report with the relevant Canadian statute, policy and/or regulation.

Recommendation	Relevant Legislation/Regulation/Policy
1. Response capacity- Spill response capacity and infrastructure must be dramatically improved.	• Funding and policy commitments required • Change relevant COGOA and the Canada Oil and Gas Drilling and Production Regulations (e.g. training and competency requirements) • Update NEB/CER Filing Requirements for Offshore Drilling in the Canadian Arctic, which deal with spill contingency plans and other related measures at the approvals application stage • Consider potential requirements, especially infrastructure, under land claim treaties and associated EA processes.
2. Atlantic-specific regulations including a 'Best Available and Safest Technologies' (BAST) requirement – New regulations specific to the North Atlantic must prohibit activities in high risk or ecologically sensitive areas and must require compliance with international best practices and best technologies, including proven seabed well-capping equipment on site, strict seasonal drilling windows, minimum distances for seismic testing, and immediate relief well capability on stand-by.	• Change relevant sections of COGOA (Canada Oil and Gas Drilling and Production Regulations and Canada Oil and Gas Geophysical Operations Regulations) • Consider other statutes for petroleum activity restrictions (e.g. Canada National Marine Conservation Areas Act, Oceans Act, Canada Wildlife Act, Canadian Energy Regulator Act and related regulations). • Oceans Act policy prohibiting oil and gas in MPAs should be strengthened into a binding regulation or statutory amendment.
3. Risk assessment and reduction – The determination of acceptable risk for offshore projects must be carried out *before* a license is granted and must be explicitly described in regulations, requiring the input of all relevant stakeholders, particularly local community representatives, with the objective being to reduce risk to a level that is 'as low as possible'.	• Add standalone regulations to COGOA and/or Impact Assessment Act describing risk assessment process • Update COGOA and Canadian Energy Regulator Act to require risk be reduced to ALAP
4. Separation of regulator responsibilities - Regulatory oversight for safety and environmental	• Update Canadian Energy Regulator Act, COGOA and CPRA

protection must be separated from the responsibility to enable oil and gas activities.	
5. Unlimited accident liability - Arctic spill liability must be unlimited in order to cover all clean-up costs and compensatory damages associated with an accident or spill of any magnitude, regardless of fault.	• Change COGOA liability rules and Financial Requirements Regulations • Change Oil and Gas Spills and Debris Liability Regulations • Update Arctic Waters Pollution Prevention Act and Fisheries Act
6. Climate test – Arctic oil and gas production must be consistent with national and global climate goals and must respect Indigenous rights	• Include requirement in CPRA and COGOA, or as separate standalone law.
7. Ecologically, Biologically or Culturally Significant Areas – Areas identified as high-risk, ecologically and biologically significant, or culturally important must be placed off-limits to oil and gas activities. This includes sensitive benthic areas, marine refuges and critical habitat for species at risk.	• Oceans Act • Fisheries Act • Species at Risk Act • Arctic Waters Pollution Prevention Act • Canadian Wildlife Act
8. Seismic testing - Strengthen evidence-based rules for seismic programs and require alternatives that are less harmful to marine wildlife.	• Canada Oil and Gas Geophysical Operations under the Canada Oil and Gas Operations Act • Statement of Canadian Practice with respect to the Mitigation of Seismic Sound in the Marine Environment • Canadian Energy Regulator Act • Canadian Energy Regulator Filing Requirements