July 10, 2018

Frontier and Offshore Regulatory Renewal Initiative
Offshore Petroleum Management Division
Natural Resources Canada
580 Booth St., 17th Floor, Room A2-1
Ottawa, ON K1A 0E4

Re: WWF-Canada Submission to the Frontier and Offshore Regulatory Renewal Initiative (FORRI) Revised Policy Intentions

WWF-Canada has reviewed the Revised Policy Intentions for the Framework Regulations and we appreciate the opportunity to submit our written comments to the governments of Canada, Nova Scotia, and Newfoundland and Labrador as part of the stakeholder consultation process. WWF-Canada has been actively engaged in FORRI since phase 3 last summer, including participating in consultation sessions in St. John's on July 25, 2017 and May 28, 2018. Below you will find our general observations and a spreadsheet with detailed suggestions on how the policy intentions can be improved.

World Wildlife Fund (WWF) is one of the largest independent conservation organizations in the world, with projects in more than 100 countries. WWF-Canada creates solutions to the environmental challenges that matter most for Canadians. We work in places that are unique and ecologically important, so that wildlife, nature and people thrive together.

General Comments

WWF-Canada supports the FORRI mandate "to modernize the regulatory framework governing oil and gas activities in Canada's frontier and offshore oil and gas areas." Modernization of the offshore regulatory regime in Canada is long overdue and we commend the governments' collective efforts in taking this important step and in seeking the advice of stakeholders throughout this process. We continue to have concerns, however, about the narrow scope of the work being done to fulfil the FORRI mandate, the role of the regulators in interpreting and applying increasingly performance-based rules, the ALARP ("as low as reasonably practicable") risk reduction principle and the test of "reasonability," the lack of minimum standards such as a "best available and safest technologies" (BAST) requirement, and the relative lack of input and participation from organizations outside of government and the petroleum industry, particularly Indigenous representatives.

1. Stakeholder Engagement

We recognize that the government has been making efforts to address concerns raised by WWF-Canada about stakeholder participation in our letter to Minister Carr dated August 24, 2017, but we believe there remains more work to be done. For instance, we are still hoping to see a FORRI stakeholder engagement session in northern Canada, Iqaluit for example, which would specifically target the participation of Inuit organizations and communities. WWF-Canada would be pleased to help facilitate

such a session and we would suggest that it could be held in conjunction with the Nunavut Impact Review Board's Strategic Environmental Assessment consultations, which will be taking place in September and October of this year in thirteen northern communities, including Iqaluit.

As Ken Paul, a director at the Atlantic Policy Congress of First Nations Chiefs, pointed out in St. John's on May 28, consultations with and input from Indigenous organizations through the FORRI process have not yet been satisfactory. As Mr. Paul stated, Indigenous peoples in Canada are not stakeholders, they are rights holders whose interests could be impacted by the changes being proposed through FORRI. As such, a higher standard of engagement and consultation is critical to the long-term success of the offshore oil and gas regulatory modernization process. This standard has not yet been met in our view. The revised policy intentions comprise a complex, technical, 100-page document that is challenging for non-experts to understand without proper context. To our knowledge, there has been no attempt to explain precisely how the updated regulations will differ from the previous rules under the Canada Oil and Gas Operations *Act* (COGOA), particularly in terms of safety and environmental protection, and how these changes may or may not impact Aboriginal rights and interests.

2. FORRI Mandate

The FORRI review is too limited to achieve its mandate to "modernize the regulatory framework governing oil and gas activities in Canada's frontier and offshore oil and gas areas" and needs to take a broader, more coordinated approach. The five regulations under COGOA that are being updated are only one component of the offshore regulatory framework. In the Arctic, Canada's oil and gas regime consists of COGOA, environmental rules (including liability), the licensing rules set out in the Canada Petroleum Resources *Act* (CPRA), relevant provisions of the National Energy Board (NEB) *Act*, the Arctic Waters Pollution Prevention *Act* and laws of general application such as the Canadian Environmental Assessment *Act* (CEAA).

Liability rules and "foreseeability"

As an illustration of the overly narrow scope of FORRI, Section 3.6(1) of the revised FORRI policy intentions document (Contingency Plan) states: "*The contingency plan shall set out the procedures, including emergency response procedures, practices and resources and monitoring necessary to effectively prepare for and mitigate against the effects of <u>any foreseeable event</u> that might compromise safety or environmental protection*…" (emphasis added).

As we understand it, the question of "foreseeability" can be contentious in the courts. If a possible hazard has been identified and ignored, the operator would certainly be considered negligent. However, oil and gas drilling operations in extreme and unpredictable environments such as the Arctic 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 liability rules set out in Canada's Energy Safety and Security *Act*. It is worth noting that the Deepwater Horizon blowout in 2010 resulted in total liability and clean-up costs of more than $50 billion USD and it is quite likely that a

major spill in the Arctic would be almost impossible to clean up with potentially devastating impacts to the marine environment. The burden of proof would be on the Canadian government to prove the operator had been negligent for clean-up costs greater than $1 billion.

One possible way to resolve this problem would be to remove the word "foreseeable" from the Contingency Plan so that an operator would be responsible for *any* event that compromises safety or environmental protection, particularly when the consequences of a major accident are severe, as is the case in the Arctic. A better alternative, however, would be simply to introduce unlimited strict or absolute operator liability in the Arctic even in the case of unforeseeable accidents, which would help to ensure that operators take every necessary precaution to prevent accidents from occurring. Other jurisdictions do not have liability caps, regardless of fault. For instance, in Norway operators are liable for all pollution damages without regard to fault, although liability can be reduced at the discretion of the government.[1] However, introducing unlimited liability in Canada would involve making amendments to the Energy Safety and Security *Act,* which is outside the scope of FORRI – and this is precisely our point. Modernization of one part of the offshore regulatory regime (in this case, COGOA) must not be seen in isolation from other components (such as liability rules).

Moreover, FORRI will give the government no indication of whether the changes being proposed to COGOA will conflict with other important policy objectives such as climate change, Indigenous consent and environmental protection. For example, in 2016 the governments of Canada and the United States resolved to lead the world in the development of low-carbon economies "including through science-based steps to protect the Arctic and its peoples."[2] Yet it is not clear whether the proposed regulatory changes under COGOA will support or undermine this goal. Addressing these broader, contemporary concerns will be critical if oil and gas resources in the Arctic are ever to be developed responsibly and sustainably, and with the required social licence.

Nothing short of a comprehensive and public review of the entire regulatory regime governing oil and gas development in Canada's frontier and offshore areas is required, as implied by the FORRI mandate. Before any regulatory changes are finalized, the federal government must ensure that all stakeholders and rights holders are properly consulted, international best practices for safety, accountability and environmental protection are in place and that areas of biological and cultural importance are not threatened. At a time of heightened public awareness and deep concern about issues such as land claims rights, benefits sharing and climate change, it is precisely the "regulatory framework governing oil and gas activities in Canada's frontier and offshore oil and gas areas" that requires a thorough review, not one piece of the regulatory puzzle.

3. ALARP and the test of "reasonability"

The Revised Policy Intentions document makes repeated use of the ALARP ("as low as reasonably practicable") risk reduction principle when discussing safety and environmental protection measures. WWF-Canada is not opposed to the use of ALARP per se but we have serious concerns around how it will be interpreted, validated, verified and enforced in practice based on: (a) the current language and lack

[1] Norwegian Petroleum Act, section 7(3).
[2] http://pm.gc.ca/eng/news/2016/03/10/us-canada-joint-statement-climate-energy-and-arctic-leadership

of guidance in the revised policy intentions; and (b) the fact that other parts of the regulatory framework (such as liability rules, regulator responsibilities, environmental impact assessment, etc.) are highly relevant to the ALARP discussion but are not part of this review process.

Federal and provincial officials leading the FORRI process confirmed in St. John's on May 28, 2018 that the test of what would be considered "reasonable" would be determined by the courts *after* an accident takes place and that the ALARP concept was intentionally not defined to allow regulators more flexibility in its interpretation and application. Leaving aside the fact that deciding *ex post facto* in the courts whether an operator has taken reasonable precautions to minimize risk does nothing to prevent an accident from occurring in the first place, courts have ruled in other cases that they are not necessarily equipped to make determinations on issues that even experts in the field cannot agree upon. With respect to Canadian jurisdiction, we are not aware of any Supreme Court ruling specifically clarifying the meaning of ALARP. However, 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 there must be a "gross disproportion" between the risk reduction and the sacrifice, for it to be considered not reasonably practicable, but did not specify what would constitute such a disproportion.

There is also 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. 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. A similar debate about operational safety in offshore oil and gas operations is well documented and ongoing, and therefore it would not be a simple matter for the courts to determine whether an operator has taken reasonable measures to sufficiently reduce risk.

It is also unclear how the calculation of reasonability by the courts would make considerations with respect to environmental protection and the preservation of non-human species and how these considerations would be weighed vis-à-vis financial costs. In the case of *ATCO Gas and Pipelines Limited (South) (Re)*, for instance, where the Alberta Utilities Commission decided that it was in the public interest to approve two applications by ATCO Gas and Pipelines Limited to construct a pipeline in Edmonton, the Commission ruled that ALARP would allow for higher risks in environments with little to no land usage and therefore human population. If it is the case that, despite the Arctic's natural and ecological value and sensitivity, it is not considered high risk because of its relative lack of humans living in proximity to it, then ALARP would not be an appropriate safety standard for protecting the environmental integrity of the Arctic.

As indicated by the U.K.'s Health and Safety Executive, ALARP provides great flexibility but also has drawbacks. Crucially, "Deciding whether a risk is ALARP can be challenging because it requires duty-holders to exercise judgement."[3] ALARP is used throughout the Policy Intentions document as a catch-all

[3] http://www.hse.gov.uk/risk/theory/alarpglance.htm

term without a clear definition. We submit that the Policy Intentions therefore require a section that addresses the details involved in life-cycle ALARP risk assessment and management activities. The actual determination of ALARP should flow from a "social process" that is explicitly described in the new regulations and involves collaborations with representatives of the following four groups:

1) the affected public;
2) governments of those affected (local, provincial/territorial, federal);
3) commercial/industrial groups;
4) civil society including Indigenous organizations.

Reducing risk to ALARP thus requires several layers of corroborations and validations and it is crucial that the regulator has the required capability and social licence to properly apply ALARP risk assessment and management processes (see section 4 below). As currently conceived in the Revised Policy Intentions, ALARP is not an appropriate standard because it does not have an established and objective meaning and interpretation, and it does not require the collaboration of key stakeholders.

As indicated, the test of "practicability" in ALARP, which is the point at which the incremental benefits of further risk reduction are insufficient to justify the incremental costs, is a cost-benefit determination, and it can be extremely difficult to quantify, particularly for the courts. One could imagine a scenario in which the risks of an Arctic blowout are deemed intolerable (particularly by local communities) because the consequences would be so severe. In such a case, the incremental costs of *any* marginal risk reduction are always justifiable and ALARP would not be the best risk-reduction strategy.

Again, an appropriate solution would be for the revised regulations to detail the ALARP risk assessment process and require operators to make the acceptance criteria and risk assessment explicit and available to the public through a formal engagement process before the operator can receive regulatory approval.

4. Role of the Regulator

There is no doubt that offshore oil companies and Canadian regulators take safety very seriously. The amount of oil spilled annually has trended downward even as production has increased. Rigs have been drilling thousands of wells over decades around the world, including Canada, with few major accidents. Despite this, the SINTEF Offshore Blowout Database includes 573 offshore blowouts/well releases that have occurred worldwide since 1955, suggesting that such incidents are not uncommon.[4] According to this 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. Although drilling expertise may be improving, deeper wells are being planned and high temperature, high pressure and more challenging wells continue to be drilled. Operators are attempting increasingly technically ambitious operations; they are expanding their operations to new, often environmentally sensitive areas, such as the Arctic, and the industry continues to tackle ever more

[4] https://www.sintef.no/en/projects/sintef-offshore-blowout-database/

challenging projects. In the Scotian Basin, for instance, BP will be drilling in nearly 3,000 metres of water — much deeper than the water in which the Deepwater Horizon accident occurred. And if oil and gas activities are ever to proceed in the Canadian Arctic, a significant amount of exploration drilling would be required. According to a Scandower report based on SINTEF data, among the various phases of offshore operations, exploration drilling entails the highest risk of blowout.[5]

The knowledge, experience and motivations of the people who form the regulatory system are therefore critical. 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 being considered through FORRI, despite the fact that it is the regulators who will be interpreting and enforcing increasingly performance-based concepts such as ALARP. For example, the responsibility of the Canada-Newfoundland and Labrador Offshore Petroleum Board (CNLOPB) and the Canada-Nova Scotia Offshore Petroleum Board (CNSOPB) for environmental protection may be inappropriate given that they are primarily designed to ensure economic benefits from oil and gas, according to the Accord Acts.[6] The explicit role of the CNLOPB, for example, is to "facilitate the exploration for and development of petroleum resources" and members of both boards are primarily drawn from industry and government.[7] 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,[8] and some community groups perceive that regulations are made to support oil activity rather than to promote environmental protection.[9] Even before the recent oil boom in Newfoundland and Labrador, representatives from the fishing industry and local communities expressed concern that the CNLOPB had been "partly co-opted by the petroleum industry."[10]

The decision of the CNSOPB to allow BP to keep a capping stack in Norway for its drilling operations in the Scotian Basin provides a case in point.[11] 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.[12] Yet from the perspective of what would be safest for environmental protection and minimize damages, capping stacks are a proven, effective technology despite being more expensive for industry. In *Edwards v. National Coal Board (U.K., 1949)*, the court ruled that there must be a "gross disproportion" between the risk reduction and the sacrifice for it to be considered not reasonably practicable, yet in the BP case it is not clear how the CNSOPB decided that requiring a capping stack on site would be a "grossly disproportionate" measure. Such decisions reinforce the need for a social process in determining an acceptable ALARP level that involves

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[5] https://officerofthewatch.com/2013/08/06/the-probability-of-an-offshore-accident/
[6] http://www.assembly.nl.ca/legislation/sr/statutes/c02.htm
[7] http://www.cnlopb.ca/about/mandate.php
[8] Bailey, Sue. "Where's the Know-How, Researcher Asks." *The Telegram*, June 7 2010, B7.
[9] Fusco, Leah. "The Invisible Movement: The Response of the Newfoundland Environmental Movement to the Offshore Oil Industry." Memorial University, 2007, p. 87-97.
[10] 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.
[11] http://thechronicleherald.ca/novascotia/1553818-opponents-of-ultra-deep-bp-well-of-n.s.-coast-speaking-at-smu
[12] https://www.cnsopb.ns.ca/sites/default/files/pdfs/bp_stakeholder_engagement_and_aboriginal_consultation_report.pdf

collaborations with representatives of the four groups described above. In addition, use of a "best available and safest technologies" (BAST) requirement in the revised policy intentions document would help to ensure that the operator meets a specified safety performance level (see section 5) while leaving less discretion for the boards to make judgments on what is a "reasonably practicable" risk reduction measure.

A good example of the need for a multi-stakeholder process in the risk assessment and management (RAM) 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.[13] 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 blowout preventer, capping stack, and relief well drilling unit. Subsequently, BP withdrew its proposal to drill, despite it being approved initially by the Australian regulator. This case illustrates the fact that regulators do not always have the required experience or expertise, and this is particularly true in the Arctic where Canadian regulators have very little experience with offshore drilling operations.

5. Best Available and Safest Technologies

One of WWF-Canada's primary concerns with the proposed FORRI revised policy intentions is the lack of a "best available and safest technologies" (BAST) requirement throughout the document, which is particularly important if the government is going to adopt the ALARP risk reduction principle.

The BAST standard is used in other jurisdictions to meet a specified safety performance level. 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.

The U.S. Outer Continental Shelf Lands Act (OCSLA) explicitly requires the use of "best available and safest technologies" on all new drilling and production operations, with only the secretary having the authority to determine whether the incremental benefits are "clearly insufficient" to justify the incremental costs of utilizing BAST.[14]

> ***(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*

[13] 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.

[14] https://www.gpo.gov/fdsys/pkg/USCODE-2015-title43/html/USCODE-2015-title43-chap29-subchapIII-sec1347.htm

> *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.*[15] (Emphasis added.)

The BAST standard would require, at a minimum, the prescriptive application of practices that have been shown to be successful and relevant to those projects that have risk characteristics similar to past operations. This approach is also goal-based, however, in that operators would not be tied to the implementation of specific technologies as the BAST standard would change and evolve over time.

The attached spreadsheet provides suggestions on specifically where in the Revised Policy Intentions the BAST standard, as well as other suggested amendments, can be incorporated.

Thank you again for the opportunity to comment on the Revised Policy Intentions document for the Framework Regulations. We would be pleased to answer any questions you might have about this submission.

Sincerely,

Paul Crowley,
Vice-president, Arctic Conservation
WWF-Canada

[15] https://www.gpo.gov/fdsys/pkg/USCODE-2015-title43/html/USCODE-2015-title43-chap29-subchapIII-sec1347.htm

Page	Section	Current Text	Comments	Proposed text
57	7.29 – Subsea Production Systems	(1) The operator shall ensure that all subsea production systems and related control systems are designed, built, installed, commissioned, tested, operated, inspected, monitored and maintained to reduce risks to safety and to the environment to as low as reasonably practicable under all foreseeable environmental and operating conditions, for all modes of operation.	BAST requirement needed here to bridge the gap between prescriptive and performance standards while allowing flexibility for operators to innovate.	(1) The operator shall use **best available and safest technologies (BAST) standards** to ensure that all subsea production systems and related control systems are designed, built, installed, commissioned, tested, operated, inspected, monitored and maintained to reduce risks to safety and to the environment to as low as reasonably practicable under all foreseeable environmental and operating conditions, for all modes of operation.
57	7.29 - Subsea Production Systems	(2) The operator shall ensure that the design of subsea production systems shall ensure: a. the effect of a single failure cannot develop into a situation that may cause a major accidental event;	A BAST requirement is needed here as a minimum standard. 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. Deeper wells are being planned and high temperature, high pressure and more challenging wells continue to be drilled. Operators are attempting increasingly technically ambitious operations, and they are expanding their operations to new, often environmentally sensitive areas, such as the Arctic, and the industry continues to tackle ever more	(2) The operator shall **use best available and safest technologies (BAST**) **standards** to ensure that the design of subsea production systems shall ensure: a. the effect of a single failure cannot develop into a situation that may cause a major accidental event;

			challenging projects. Presumably the safety of subsea production systems in Canada will be evaluated by the regulator, which highlights the importance of BAST, board membership, and the social process required to determine life-cycle ALARP risk assessment.	
84	Definitions		A definition of "risk" and "ALARP" and its method of determination is required. The U.K.'s Health and Safety Executive states that "There is no simple formula for computing what is ALARP. Deciding whether a risk is ALARP can be challenging because it requires duty-holders (operators) and us to exercise judgment. In reality many decisions about risk and the controls that achieve ALARP are not so obvious"	The ALARP ("as low as reasonably practicable") risk reduction principle involves a computation that must be made in which the quantum of risk is placed on one scale and the sacrifice involved in the measures necessary for averting the risk is placed on the other. Incremental measures need not be taken only if it is shown that there is a gross disproportion between the risk reduction and sacrifice.
12	3.4 - Safety Plan	The safety plan shall set out the procedures, practices, resources, sequence of key safety-related activities and monitoring measures necessary to manage hazards and to conduct the proposed work or activity safely and shall include:	ALARP should be incorporated here.	The safety plan shall set out the procedures, practices, resources, sequence of key safety-related activities and monitoring measures necessary to manage hazards and to conduct the proposed work or activity safely **to reduce risks to as low as reasonably practicable** and shall include:
13	3.5 - Environmental Protection Plan	The environmental protection plan shall set out the procedures, practices, resources and monitoring necessary to	Include the ALARP standard here so that its determination involves collaborations with all relevant	The environmental protection plan shall set out the procedures, practices, resources and monitoring

		manage hazards to and protect the environment from the proposed, work or activity and shall include	stakeholders, as well as the Certifying Authority, so that all hazards are identified and assessed correctly and the proposed procedures and practices to manage hazards are sufficient. The management of these hazards must be verified on an ongoing basis.	necessary to manage hazards to and protect the environment from the proposed, work or activity **to reduce risks to as low as reasonably practicable** and shall include
13	3.6 - Contingency plan	(1) The contingency plan shall set out the procedures, including emergency response procedures, practices and resources and monitoring necessary to effectively prepare for and mitigate against the effects of any foreseeable event that might compromise safety or environmental protection and (at a minimum) shall include, where applicable:	In the Arctic, this could include natural hazards presumably but if an accident were to occur due to an event that is deemed "unforeseeable," would the operator be liable for clean-up and damages beyond $1 billion(Energy Safety and Security Act)? Norway and Russia do not have liability caps. At a minimum, remove the word "foreseeable" from the contingency plan.	(1) The contingency plan shall set out the procedures, including emergency response procedures, practices and resources and monitoring necessary **to effectively prepare for and mitigate against the effects of any event** that might compromise safety or environmental protection and (at a minimum) shall include, where applicable:
14	3.6 - Contingency plan	(2) The contingency plan shall include a description of the source control and containment measures and arrangements to stop the flow from an uncontrolled well and to minimize spill duration and environmental effects, and must demonstrate the adequacy of, and access to those measures and arrangements, including:	BAST requirement is needed. In the Arctic this could mean capping stacks, relief wells and blowout preventers. "Minimizing" environmental effects is not a sufficient goal in extremely high-consequence environments such as the Arctic. <u>This must be defined.</u> E.g.: Will environmental impacts and spill duration be "minimized" in the Arctic if the capping stack is coming from Norway? Again, stakeholder	(2) The contingency plan shall include a description of the source control and containment measures and arrangements to stop the flow from an uncontrolled well and to **limit spill duration to 24 hours maximum** and minimize environmental effects, and must demonstrate that the adequacy of, and access to those measures and arrangements comply and conform with **best practices and with the**

			input/analysis through the ALARP risk assessment and management process is essential.	**best available and safest technologies (BAST)**, including:
14	3.6 - Contingency Plan	3) If a spill-treating agent is being considered for use as a spill-response measure, the applicant shall include in the plan:	Spill treating agents are a highly controversial topic. Industry is now developing Subsea Dispersant Injection (SSDI) technology, which involves the use of dispersants on the ocean floor at the source where the well is leaking. This technology has not been proven to be effective or safe for marine life. Some studies suggest that the chemical dispersant Corexit, which was used widely in the Deepwater Horizon blowout, actually increases the toxicity of oil. In 2017, an expert panel of the Royal Society of Canada issued a report on the impact of oil spills and suggested that not enough is known about dispersants to approve their use.[16] The use of dispersants was first approved in the Energy Safety and Security *Act* in 2015. Again, this *Act* is outside the purview of FORRI, despite being highly relevant to the regulations being proposed in the Revised Policy Intentions document.	***Required: "Given that too little is known about the toxicological effects of chemical dispersants, the use of dispersants must be considered only as a last resort on a case by case basis and only in strictly limited quantities when all other response measures are deemed inadequate."***
17	4.3 Safety and Environmental Protection	(1) The operator shall take all reasonable precautions required to	The test of "reasonability" is a cause for concern as explained in section 3 above. The courts are not necessarily	(1) The operator shall **take all precautions required to reduce risks to ALARP** and to ensure

[16] Royal Society of Canada, "The Behavioural and Environmental Impacts of Crude Oil Released Into Aqueous Environments", Nov. 2015

		ensure safety and environmental protection including ensuring that: (2) The operator must ensure the measures and arrangements for source control and containment equipment to stop the flow from an uncontrolled well and to minimize spill duration and environmental effects outlined in the Contingency Plan continue to be accessible throughout the authorization period as promptly as possible, and ensure they are deployed as soon as the circumstances permit.	capable of determining what precautions are reasonable in cases where even experts cannot agree. Either eliminate "reasonable" or refer to the section that addresses the social process required to determine life-cycle ALARP risk assessment and management activities. Phrases such as "as promptly as possible" and "as soon as the circumstances permit" are too vague and should be defined more clearly.	safety and environmental protection including ensuring that: (2) The operator must ensure the measures and arrangements for source control and containment equipment to stop the flow from an uncontrolled well and to minimize spill duration and environmental effects outlined in the Contingency Plan continue to be accessible throughout the authorization period **immediately**, and ensure they are deployed **without delay**.
20	5.7 Certification Plan	c. A list of codes and standards that will be applied to installations, vessels, facilities, equipment and systems that are to be certified, and considering the entire lifecycle (inclusive of the design, construction, transportation, installation, commissioning, operation, maintenance and decommissioning etc.) of the project, and in the event no codes or standards are applicable, any studies and analysis that demonstrate the measures put in place will be adequate to reduce risks to as low as reasonably practicable; d. Any other measures undertaken to reduce risks to as low as reasonably practicable that fall within the scope of work of the Certifying Authority.	Unclear how ALARP will be interpreted and applied and what the role of the boards will be in doing so.	***Required: Add section to the Policy Intentions that addresses the social process required to determine life-cycle ALARP risk assessment and management activities (see section 3 above).***

24	6.2 - Concept Safety Analysis and Quantitative Risk Assessment	a. Identify all hazards having the potential to cause a major accidental event; b. Include a detailed and systematic assessment of the unmitigated risks associated with each of those hazards, including the likelihood and consequences of each potential major accidental event; c. Define target levels of safety for the risk to life and the risk of damage to the environment that are to be achieved for all activities within each phase of the life-cycle of the installation, facilities, equipment and systems; d. Identify all underlying assumptions and control measures that are to be implemented to reduce those risks to a level that is as low as reasonably practicable	ALARP will change depending on the consequences (e.g.: Arctic should have lower risk tolerance) and therefore the target levels of safety, risk assessment and hazard identification will change. These must be determined through a collaborative, social process. Canadian regulators have very little experience in Arctic offshore drilling. It is unclear how various factors are to be weighed and how risk will be assessed and managed.	***Required: Add section to the Policy Intentions that addresses the social process required to determine life-cycle ALARP risk assessment and management activities (see section 3 above).***
25	6.3 - Independent Verification	(1) The operator shall ensure that any new proposed technology has been independently verified, through a systematic and comprehensive technology qualification process, to be safe and fit for purpose for its intended application.	BAST required.	(1) The operator shall ensure that any new proposed technology has been independently verified, through a systematic and comprehensive technology qualification process, to be safe and fit for purpose for its intended application, **and is consistent with international best practices and best available and safest technologies (BAST).**
25	6.4 - Physical and	(1) The Operator shall ensure that every installation or pipeline is	BAST required.	(1) **The Operator shall ensure that every installation or pipeline**

	Environmental Conditions	designed to withstand or avoid, without loss of overall structural integrity or main safety function, all foreseeable site-specific physical and environmental conditions, or any foreseeable combination of physical and environmental conditions at its intended location.	Test of "foreseeability" is problematic (see section 2 above) and should be removed.	**meets or exceeds the best available and safest technologies (BAST)** and is designed to withstand or avoid, without loss of overall structural integrity or main safety function, **all site-specific physical and environmental conditions**, or **any combination of** physical and environmental conditions at its intended location.
26	6.5 - General Design	(1) The operator shall ensure that every installation or pipeline is designed to reduce risks to as low as reasonably practicable.	BAST required.	(1) The operator shall ensure that every installation or pipeline is designed **to meet or exceed best available and safest technologies (BAST)** and to reduce risks to as low as reasonably practicable.
29	6.8 - Prevention and Mitigation of Major Accidents	1) The operator shall ensure that the reliability and availability of every system, the failure of which could cause or contribute substantially to a major accident event or the purpose of which is to prevent or limit the effects of a major accident event, is demonstrated through formal and appropriate risk and reliability analysis techniques to identify required redundancies and measures to protect that system from failure.	The meaning of "formal and appropriate risk analysis techniques" is not clear. ALARP is required here with a reference to the life-cycle risk assessment and management process. <u>As explained above, the Policy Intentions require a section that addresses the details involved in life-cycle ALARP risk assessment and management activities.</u>	1) The operator shall ensure that the reliability and availability of every system, the failure of which could cause or contribute substantially to a major accident event or the purpose of which is to prevent or limit the effects of a major accident event, is demonstrated through formal and appropriate risk and reliability analysis techniques **through a life-cycle ALARP risk assessment and management process** to identify required redundancies and measures to protect that system from failure.
53	7.1 - Well control	The operator shall ensure that adequate procedures, materials and	BAST required.	The operator shall ensure that adequate procedures, materials and

		equipment are in place and utilized throughout the life of the well to prevent the loss of well control.		equipment are **consistent with international best practices and best available and safest technologies (BAST)** and are in place and utilized throughout the life of the well to prevent the loss of well control.
77	14.9 - Incidents and Near Misses	The operator shall notify the Board of an incident as soon as the circumstances permit, but no later than 24 hrs after becoming aware of the incident, in the form and manner as prescribed by the Boards.	Change “as soon as circumstances permit” to “without delay”.	The operator shall notify the Board of an incident **without delay**, and if not possible, no later than 24 hrs after becoming aware of the incident, in the form and manner as prescribed by the Boards.
67	8.1 - Geoscience, Geotechnical and Environmental Ops	f. where a seismic or electrical energy source is used, all such operations must be completed in a manner that eliminates all potential safety risks to divers and that minimum distances required to ensure safety of divers have been identified and followed; and	Some studies have shown severe impacts of seismic blasting on marine wildlife. Minimum distances for marine wildlife from seismic activity are required and seismic surveys must have strict mitigation guidelines involving turning off equipment when marine mammals are within certain exclusion zones. The minimum safety distance is likely farther in the Arctic than in non-polar areas, which must be taken into account and the precautionary approach is needed until research can provide more certainty on the impacts of blasting. For example, underwater noise from vessel traffic can readily propagate over 100 kilometres in the Arctic, therefore an area of interest attempting to restrict underwater	f. where a seismic or electrical energy source is used, all such operations must be completed in a manner that eliminates all potential safety risks to divers **and marine life** and that minimum distances required to ensure safety of divers **and marine life** have been identified and followed; No seismic programs will be carried out within 100 km of an area that has been identified as sensitive to underwater noise. Safer alternatives to seismic programs are required whenever possible.

			noise would need to keep vessels at least 100 km away from its boundaries.[17] In addition, there are known, safer alternatives to seismic testing such as vibrasize, which must be encouraged or required whenever possible.	
	Life-cycle risk assessment and management (RAM)	<u>As explained above, the Policy Intentions require a section that addresses the details involved in life-cycle ALARP risk assessment and management activities.</u> The actual determination of ALARP should flow from a "social process" that is explicitly described in the new regulations and involves collaborations with representatives of the following four groups: 1) the affected public; 2) governments of those affected (local, provincial/territorial, federal); 3) commercial/industrial groups; 4) civil society including Indigenous organizations. Reducing risk to ALARP requires several layers of corroborations and validations and it is crucial that the regulator has the required capability and social licence to properly apply ALARP risk assessment and management processes (see section 4 above). As currently conceived in the Revised Policy Intentions, ALARP does not have an established and objective meaning and interpretation, and it does not require the collaboration of key stakeholders. The revised regulations must explicitly detail the ALARP risk assessment process and require operators to make the acceptance criteria and risk assessment explicit and available to the public through a formal engagement process before the operator can receive regulatory approval.	

[17] Halliday, William D., Pine, Matthew K., and Stephen J. Insley. (Forthcoming). 'Underwater Noise in the Arctic: A State of Knowledge Review.' Wildlife Conservation Society of Canada.