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EVIDENCE

Tuesday, November 2, 2010

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Chair

Mr. Leon Benoit

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• (1105)

[English]

The Chair (Mr. Leon Benoit (Vegreville—Wainwright, CPC)): I call the meeting to order.

Good morning, everyone.

We have two items on the agenda today. The first is a continuation of discussion on a motion that Mr. Cullen brought before the committee in the spring. This actually isn't a part of our study on energy security, but a continuation of the spring study.

All of the witnesses or groups have been here before. It's great to see you all back again.

I want to remind the committee that at the end of the meeting we will take a few minutes to discuss and to pass our committee report on the NRU medical isotopes off to Parliament if we can. We have some motions that we have to deal with on that matter. How much time do you think will be necessary for that? Would it be ten minutes?

Go ahead, Mr. Cullen.

Mr. Nathan Cullen (Skeena—Bulkley Valley, NDP): I'm not even sure there's anything votable in this last session. We are seeing some dissenting reports, but there's nothing yet to vote on. I thought this was more of a—

The Chair: We have to choose a title; there is no title. We have to pass it, and then we have to determine some other issues.

Mr. Nathan Cullen: Oh, that's very important, the title. Okay. It would be a maximum of ten minutes, I would say.

The Chair: Okay, we'll leave ten minutes at the end. I want to make sure that we leave adequate time.

We'll start our meeting, then, with the witnesses appearing in the order stated on the agenda. We'll start with Mr. Max Ruelokke, chairman and chief executive officer of Canada-Nova Scotia Offshore Petroleum Board.

Mr. Max Ruelokke (Chairman and Chief Executive Officer, Canada-Newfoundland and Labrador Offshore Petroleum Board): No, it's the Canada-Newfoundland and Labrador Offshore Petroleum Board.

The Chair: I'm sorry; yes, I've gone one too low. It's the Canada-Newfoundland and Labrador Offshore Petroleum Board. You could have said anything you wanted and then attributed it to somebody else. It was a real opportunity.

Mr. Max Ruelokke: I do have to live next to my colleagues in Nova Scotia.

The Chair: Yes, okay.

Thank you all very much for coming. We look forward to your comments. Each group has up to ten minutes for opening comments, and then we'll get to questions.

Go ahead, please.

Mr. Max Ruelokke: Thank you very much.

Mr. Chairman and members of the committee, it's a pleasure to be here again today and to have this opportunity to talk to you about offshore emergency response in the Newfoundland and Labrador offshore area.

When we talk about emergency response, we really need to take a broad view of what an emergency is. An emergency response plan will typically list ten or more types of occurrences that will be classified as emergencies, all of which will require response. Many of them will present far greater hazards to human safety than will an oil spill.

Emergency response plans are designed around a requirement for operators to respond to all types of emergencies that occur on or immediately adjacent to their facilities.

When I say "operator", I mean an offshore oil and gas company that's licensed to operate in a particular area. Throughout this presentation, when I refer to operators, I'm referring to oil and gas companies.

Operators would activate the same emergency response plan for a blowout as the operators involved did for the Cougar helicopter crash in 2009. At that crash, you should know that the first responders to the crash scene were a fixed-wing aircraft and two helicopters, all under contract to the operators, not Department of National Defence search and rescue helicopters, which arrived a considerable time later. This certainly demonstrated that we have a very robust emergency response capability in our offshore area.

There has been a lot of media attention about the environmental and economic consequences resulting from the Macondo blowout in the Gulf of Mexico, and rightly so. However, it is very important for everyone to remember that the first thing that happened when this tragedy occurred is that 11 people died and 17 more were injured. This fact may have been lost in much of the ongoing media coverage about the Macondo incident, but it has not been lost on regulators. Safety is, and always will be, paramount in all decisions taken by this board and by my colleagues on the other boards.

When assessing a drilling application, we are essentially looking for three things: whether the operator has the appropriate equipment to do the job safely, whether personnel are adequately trained to do the job, and whether the necessary procedures are in place for safe operations. Prior to issuance of the operations authorization, a number of statutory obligations must have been met, including those of the Canadian Environmental Assessment Act and the Canada-Newfoundland Atlantic Accord Implementation Act, as well as regulations and obligations arising from Transport Canada and from the independent third party certifying authority. Operators must file a safety plan, an environmental protection plan, and a contingency plan that includes an oil spill response plan. In addition, they must submit documentation respecting financial responsibility.

Finally, they must provide a declaration of fitness, attesting that the equipment and facilities to be used during their programs are fit for the purpose, that the operating procedures relating to them are appropriate, that the personnel employed are qualified and competent, and that the installation meets all necessary Canadian standards. Only after all of this documentation is presented to and approved by the board may an operator proceed with the activity.

Drilling and well control are critical aspects of offshore operations and are addressed extensively in the regulatory framework. This involves a review of the operator's well planning and the technical capabilities in respect of well encasing design, well control matters, kick prevention and detection, and establishment of severe weather operating limits, as well as a review of emergency disconnect requirements and an assessment of the relief well drilling arrangements. Emphasis is also placed on ensuring that personnel have the requisite training in well control and blowout prevention. A review is conducted to ensure suitable redundancy of the blowout preventor activation and control systems in the event of any situation that could result in a disconnect from the well.

Oversight of these matters is achieved in a systematic manner through the board's safety assessment system, which includes a review of the operator's safety management system and confirmation that the operator has identified the hazards and the measures to be put in place to reduce the risks of those hazards to a level that is as low as reasonably practicable.

Although we have a robust regulatory regime and exercise substantial oversight of offshore activity, accidents can and unfortunately will happen. Therefore, it is important to have plans in place to address the impacts of incidents when they occur. Operators provide our offshore petroleum board with a contingency plan that includes an oil spill response plan. The board's safety and environmental professionals review these plans for each project.

Response plans include details on how relief wells could be drilled if necessary. However, what the response plans have not included to date is any detail on the subsea containment of a blowout. As we saw from the Macondo activity, it was containment that ended the blowout before the relief well was completed.

We are currently watching keenly the development of new containment capability by the Marine Well Containment Company formed in July by Exxon Mobil, Chevron, Shell, and ConocoPhillips, and joined recently by BP. Collectively, they have committed over \$1 billion U.S. to develop advanced containment capability,

equipment, and specially trained personnel to combat any future subsea blowouts or other loss of containment in the Gulf of Mexico. We—and I suspect other regulators in other offshore regimes—are examining ways to ensure that a similar or the same capability would be made available to deal with any blowouts in our offshore area.

Oil spill response plans describe a three-tier system. Tier one spill response involves activation of on-board spill response equipment sufficient to address small-scale spills of less than 100 barrels. If the equipment on site is insufficient, the operator will move to a tier two response, which involves mobilizing equipment located in St. John's, available to the operators through the Eastern Canada Response Corporation and typically capable of dealing with spills of up to 100,000 barrels. If the equipment available on board and through the ECRC is insufficient, the response moves to tier three, which means that operators have to acquire response equipment elsewhere in Canada or internationally, much of which is in specialized depots, such as in Southampton, U.K., and can be mobilized to Newfoundland and Labrador within 24 hours. Each operator exercises their emergency response plan quarterly, and collectively the operators conduct a field exercise each year, which involves the deployment of spill response equipment.

The question that has been on everybody's mind, particularly since the Macondo incident, is whether we are ready for a large-scale release of hydrocarbons into the environment as a result of offshore oil and gas activity in the event such an unfortunate incident should occur. For some people the concept of readiness implies that companies be able to recover most or all of the oil released into the environment. This is simply not currently achievable. We do expect that the Macondo tragedy will result in considerable additional research and development into improved spill response capability.

The reality is that oil spills in the marine environment are addressed through several processes, both natural and mechanical. The North Atlantic Ocean is a harsh environment, and recovery of oil from that ocean is very difficult even in the best of weather conditions. However, the biggest threat to marine mammals and birds is oil slicks. Therefore, emergency response measures also consider the value of oil dispersal as a means of minimizing impacts. At this time, we do not sanction the use of chemical dispersants as an oil spill response measure, but we are reviewing this in light of the Macondo experience, in consultation with experts at Environment Canada and Fisheries and Oceans.

If there were a major spill on the Grand Banks, environmental assessments done for the projects to date include detailed modelling of the potential fate of a spill at locations in the Newfoundland and Labrador offshore area. Using 40 years of weather data, these models indicate that even if a large spill were to occur, it is unlikely that oil would approach the Newfoundland and Labrador shoreline. The impacts of a spill occurring this far from the Canadian coastline nevertheless would be serious and would require immediate response, but it would be a situation substantially different from what we saw in the Gulf of Mexico.

I have just a couple of quick points before closing.

Production of oil from our offshore area started in 1997. As of the end of March, 2010, nearly 1.2 billion barrels of oil had been produced, and of that 1,100 barrels of crude had been spilled, less than one barrel spilled per million barrels produced. In the Gulf of Mexico, prior to the Macondo tragedy, for every one million barrels produced, 13 barrels had been spilled, and that figure is only for spills of greater than 50 barrels. There have been no blowouts in our offshore area. Obviously, we would prefer to have no injuries and no spills, but we believe that the record for our offshore area is quite reasonable.

In the wake of the Macondo incident, the CNLOPB, like all regulators, is keeping a sharp eye on lessons learned. It will help us to improve our performance as regulators and to improve the performance of those we regulate. We are confident in our robust safety and environmental protection regime, but we are always open to ways in which it can be improved.

Thank you, and I look forward to your questions when you have them.

•(1110)

The Chair: Thank you very much, Mr. Ruelokke.

We go now to the Canada-Nova Scotia Offshore Petroleum Board. We have two gentlemen with us today, Stuart Pinks, chief executive officer, and Keith Landra, director of operations, health, safety and environment. Welcome.

I understand that Mr. Pinks will deliver the comments. Go ahead, please.

Mr. Stuart Pinks (Chief Executive Officer, Canada-Nova Scotia Offshore Petroleum Board): Thank you very much for the opportunity to appear here this morning.

I think most of you are aware that both our chair and I appeared before this committee back on May 25. Today, I'd like to take the opportunity, especially for new members of the committee, to provide a brief update of what was stated previously, and then move on to provide the committee with an update on other relevant information on developments since that time.

Since the drilling of the first exploration well in 1967, there have been a total of 207 wells drilled to date in the Nova Scotia offshore area. During this time, there have been two producing projects brought on stream, with a third under development. At present there is no drilling activity taking place in the Nova Scotia offshore area, nor is there any drilling being proposed in the near term.

The Sable offshore energy project, which is operated by Exxon Mobil, is the only currently operating project within our jurisdiction. It involves the production of natural gas from five separate fields in shallow water about 225 kilometres off the east coast of Nova Scotia. Production from this project began in December 1999 and is expected to continue well into this decade.

•(1115)

The Chair: Excuse me, Mr. Pinks; the interpreters aren't quite able to keep up. Could you slow it down a little, please?

Mr. Stuart Pinks: Shall I go back, or continue from here?

The Chair: Go ahead.

Mr. Stuart Pinks: Now under development is Encana's Deep Panuke offshore gas development project. It involves the production of natural gas from an offshore field located approximately 250 kilometres southeast of Halifax, and it's also in shallow water. Production is scheduled to begin in the last quarter of 2011. The Nova Scotia offshore area is predominantly a gas-prone region; only small amounts of light oil have been discovered to date.

In authorizing any work activity to be conducted offshore in Nova Scotia, the board holds operators accountable for taking the steps necessary to prevent the occurrence of hazardous incidents or spills. However, should a major accident, spill, or uncontrolled release of hydrocarbons occur during an authorized activity, the operator would be fully accountable and responsible for attending to any consequences and for any resulting damages. The CNSOPB would normally lead the government response in such situations and would coordinate with other federal and provincial government departments and agencies as appropriate. The exception is in cases of a leak from an export pipeline, for which the government response would be jointly led by our board and our colleagues at the National Energy Board.

Both the Sable project and the Deep Panuke project produce natural gas. Some of the producing fields do, however, contain some associated light hydrocarbon liquids called condensate. Given the properties of condensate, which is like a blend of kerosene and naphtha, the resultant surface sheen, should there be a release, would have a thickness measured in microns. It is very thin. Its overall size would be limited, given that it would rapidly dissipate through evaporation and through dispersion within the upper water column. This is very different from a crude oil spill.

All operators have a contract with an environmental response organization, such as Eastern Canada Response Corporation, to provide additional resources and expertise as and when necessary in responding to a spill. The regulatory regime in place for preventing the occurrence of hazardous incidents and spills and for assuring an appropriate response to such incidents is comprehensive and robust.

It is interesting to note that the U.S. government, in response to the Deep Water Horizon incident, has recently issued two new sets of rules for oil and gas operations being conducted on their outer continental shelf. The first rule requires operators to develop and implement safety and environmental management systems, something the offshore boards have required of operators for many years. The requirement for safety and environmental management systems has been ingrained in the new offshore drilling and production regulations promulgated here in Canada last December. These regulations actually go further, in that they also require operators to develop and implement safety plans and environmental protection plans that, among other things, describe how the operator's safety and environmental management systems will be applied to the actual activities that are to be carried out.

The second new set of rules in the U.S. amends drilling regulations related to well control. Board staff are currently reviewing these new U.S. requirements in detail to determine if there are any changes we need to make on a go-forward basis.

The new offshore drilling and production regulations make operators fully accountable for safety and environmental performance and drive them to adopt best standards and practices for conducting their work. A key element of our legislation is the ability of the board to issue comprehensive guidelines to aid operators in understanding and interpreting how they may achieve regulatory compliance. A set of four guideline documents has been issued for comment and interim use in association with the recently promulgated drilling and production regulations. These guidelines identify, among other things, recognized best standards and practices for conducting work, along with the requirements for regulatory filings when seeking board authorizations and approvals.

Another important update I wish to deliver to you today pertains to the international regulatory response to the Gulf of Mexico incident. The CNSOPB and the CNLOPB are members of the International Regulators' Forum, which is a group of nine regulators from around the world that regulate health and safety in most of the largest offshore oil- and gas-producing regions, including the U.K., Norway, Australia, and the U.S. This international regulators forum, which we refer to as the IRF, has been operating since 1994 for the purpose of driving forward improvements in health and safety in the sector through collaboration and joint programs and through the sharing of information and best practices. The National Energy Board has also stayed abreast of IRF initiatives, having been actively involved in three of the IRF conferences that this group has put together since 2005.

• (1120)

In September the IRF had a two-day extraordinary meeting hosted by the Bureau of Ocean Energy Management, Regulation and Enforcement, the new division of MMS in Washington. This meeting was the first extraordinary meeting convened in the forum's 17-year history and was called specifically to address issues related to recent offshore oil and gas incidents, particularly the loss of well control related to the Montara well off Australia and the Macondo well in the Gulf of Mexico. During the meeting, IRF members discussed how to best respond to these incidents from a regulatory perspective. Additionally, many of the industry associations talked to

the forum or briefed the forum on initiatives to improve the safety of offshore operations.

At the conclusion of this meeting the IRF confirmed its commitment to improving the safety of offshore operations and to providing leadership in global offshore safety regulations. These matters were also discussed at the third IRF offshore safety conference that was held in Vancouver, British Columbia, in early October. Hosted by Canada, the conference saw close to 200 delegates representing industry and regulators from 17 different countries, who came together for three days of productive discussions on a range of offshore safety topics. Following this conference, IRF members met and approved the strategic agenda focusing on the following topics: safety, culture, leadership, blowout preventer integrity, operational issues, performance indicators, operator competency, capacity criteria, the use of standards, and industry best practices.

In closing, I hope this update serves to maintain your confidence and that of the Canadian public in Canada's offshore regulatory regime.

Thank you for this opportunity.

The Chair: Thank you very much, Mr. Pinks, for the information you've given today.

We'll go now to the third group before us. From the National Energy Board we have Gaétan Caron, chair and chief executive officer, and Bharat Dixit, team leader, conservation of resources.

Welcome, both of you. Go ahead with your presentation, please.

Mr. Gaétan Caron (Chair and Chief Executive Officer, National Energy Board): Thank you, Mr. Chair.

Good morning, honourable members of Parliament.

[*Translation*]

I thank you for the opportunity to appear before you today and I look forward to providing you with an update on the status of Emergency Response to Offshore Oil and Gas Drilling.

[*English*]

On May 11, just weeks after the blowout in the Gulf of Mexico, the National Energy Board committed to reviewing the safety and environmental requirements for offshore drilling in the Canadian Arctic.

Since I last appeared before you in May, more than 115 different groups and organizations have registered to participate in our Arctic review, including northern communities, aboriginal groups, environmental non-governmental organizations, other regulators, governments, and industry.

On September 20 the NEB announced that the Arctic review would be conducted in three phases. The purpose of phase one, which is in progress, is to gather the best available knowledge about offshore drilling in an Arctic environment. To further build our knowledge base, the NEB also released a call for information on September 30, inviting anyone with expertise or knowledge to provide this information to the NEB. More calls for information are expected.

The board will also consider the recommendations of the U.S. government's national commission on the BP Deepwater Horizon oil spill and offshore drilling, which we now expect to be available in January 2011.

Phase two of the review will give the participants an opportunity to examine the information collected, to ask questions, and to provide their comments on the information. Once phase two is complete, the board will then consider all the information gathered and produce a public report to be used in our examination of any future applications for offshore drilling in the Canadian Arctic. This review will be public; it will be transparent, and there will be opportunities for people who are concerned about these issues to get involved.

Meetings are already being scheduled to discuss the Arctic review with northern communities. For example, on November 24 we will be in Inuvik to meet with the Inuvialuit Regional Corporation. In early December we will also be meeting with the Inuvialuit Game Council and the Wildlife Management Advisory Council.

The NEB intends to visit other northern communities, including communities in Nunavut, to hear their concerns.

I would like to stress that it is very important for the NEB to meet with and listen to northern communities. They are the people who will be most affected by any decision made regarding offshore drilling in the Canadian Arctic.

In an information package we released just last Thursday, we described the process by which people can ask for meetings with us as part of phase one for fact-finding and information gathering. We have asked people to tell us by January 31, 2011.

We have also announced that we intend to retain consultants and experts in order to acquire some of the knowledge we need, and we have asked for anyone registered in the review to suggest by the end of November areas where current information may be lacking or insufficient and which may be secured by contract.

Finally, we announced that we would make up to \$300,000 in funding available to assist participants with travel costs related to attending phase two meetings. These meetings are scheduled for next spring in Inuvik, Iqaluit, Yellowknife, Whitehorse, and other locations as necessary. The meetings will provide Canadians with the opportunity to examine the information we have collected to date and to question each other about this information.

One of the topics the NEB will examine during the review is the area of emergency response. Our focus is on preventing accidents from happening in the first place. At the same time, the NEB must be ready to respond to any emergency situation at any time. If an offshore drilling spill or incident were to occur in the Canadian Arctic, the NEB would be the lead federal agency. It is our job as the lead agency to hold the operator accountable for anticipating, preventing, mitigating, and managing incidents and oil spills of any size or duration.

To ensure that the company is fully prepared to respond to an incident, the NEB enforces a comprehensive set of rules on emergency preparedness. A critical requirement for offshore drilling, which is set out in section 6 of the Canada oil and gas drilling and

production regulations, is the need for companies to provide an emergency response plan, which is reviewed in detail by the NEB before any drilling authorization may be issued. If there are gaps in the plan, the company would have to address these gaps before the board would consider permitting the drilling to occur.

The regulations also call upon industry to identify the scope and frequency of the field practice exercises, as well as to coordinate these efforts with federal, territorial, and municipal response agencies. As lead agency, we would have the key role in emergency response. To prepare for potential future offshore drilling, our staff has participated in six emergency response exercises in the past six months alone, and more exercises will take place in the future.

•(1125)

[Translation]

Before any project is approved, the NEB must be satisfied that an operator's drilling plans include robust safety, emergency response and environmental protection plans which meet the Board's standards. The NEB reviews every single application to make sure that workers and the public will be safe and the environment will be protected.

Safety, environmental protection and conservation of the resource are the only relevant factors the Board may examine when considering an application under the *Canada Oil and Gas Operations Act*. This is stated explicitly in the purpose of the Act.

[English]

As part of the review, the board will be looking very carefully at new U.S. safety rules released in early October. At first glance, as my colleague Mr. Pinks said, I can say that many of the changes being implemented since the moratorium has been lifted in the U.S. are already included in Canada's regulatory regime. As an example, the new U.S. regulations require companies to acquire an independent third-party certification demonstrating the safety of rig operations, something that is already addressed in our legislation. The new U.S. regulations also call for industry to develop an integrated safety and environmental management system. Canada's regulations already require operators to have safety and environmental management systems. In other words, the United States is moving towards where Canada has been.

The last topic I'd like to raise, Mr. Chair, is learning from others. As Mr. Pinks said, Canada is an active participant in the International Regulators Forum. The IRF held its latest major conference in Vancouver just two weeks ago, and several NEB staff, including Dr. Dixit and me, attended the three-day conference.

My own personal learning from that conference is that the key players in the offshore regulatory world, including the United States, Norway, Denmark, the U.K., Ireland, Australia, Mexico, Brazil, the Netherlands, and Canada, are very united around the concept that we need to promote the safety culture in offshore drilling; that we need to rely on management systems to promote that culture; that the role of regulators is to hold the industry accountable for the desired safety, environmental, and emergency response outcomes; and that audits of these management systems and field inspections form a key part of the enforcement tool kit of offshore safety regulators, including the NEB.

• (1130)

Thank you, honourable members of Parliament, for the opportunity to provide you with an update on the status of emergency response to offshore oil and gas drilling at the NEB.

[Translation]

The Chair: Thank you, Mr. Caron.

[English]

We go now to questions and comments. Each member has up to seven minutes. We will begin with the official opposition.

Mr. Tonks, go ahead, please.

Mr. Alan Tonks (York South—Weston, Lib.): Thank you, Mr. Chairman, and thank you to our witnesses for being here.

Those were very comprehensive and enlightening observations. Sometimes, Mr. Chairman, one would like to have the public in the room when these presentations are being made, because I think they would give the public more confidence that the regulatory tools and the outreach to the international community that has been described are being developed to make sure we have the absolute best practice in place.

Having said that, as a layperson I'm not very aware of the actual mechanics of containment, relief wells, and the engineering and technical responses. I appreciate very much the overview with respect to management processes, accountability, and closing the accountability loop.

Mr. Ruelokke, with respect to response plans, you acknowledge that the offshore Arctic and drilling in the north involve a climate and a set of circumstances that are different from those in the gulf in terms of post-event occurrences.

As part of your testimony, you talked about containment. You almost made it appear as though containment and the research that is going into containment is as necessary as, and perhaps more necessary than, the drilling of relief wells as an emergency precaution. At least that was my inference.

Could you expand on that a little, please?

Mr. Max Ruelokke: Certainly. It's a very good question. I'm happy to try to deal with that.

When I refer to containment, I'm talking about containment efforts that are put in place after an incident has happened, so after there's some sort of failure of equipment and procedures like we saw in Macondo. You will recall—we'll all recall—that several things happened simultaneously in the aftermath of the Macondo incident.

The first thing was that there were two relief wells spudded in the immediately adjacent area to make sure that one of them would succeed. Everybody knew that was going to take a number of months, and it did take quite a number of months.

There were also, simultaneously, a number of activities focused on trying to contain the oil at the wellhead, where the oil was coming out of the blowout preventer. The first one involved a large structure. Because of the presence of gas coming from the well at the well border, hydrates formed and caused freezing, so that actually caused that big container they had lowered over the well to lift off it.

There were a number of other efforts made to put devices on top of the well to contain the oil. Eventually, that was what happened. They put a device on the top of the head that caused the spill to cease.

To get there, though, they were kind of starting from scratch. There had really been no organized plan of activity aimed at containment of that nature for that kind of spill. What has happened since then, of course, is that BP itself has learned a lot of lessons, and it had folks from other operators helping as it was doing that.

You'll note I refer to something called the Marine Well Containment Company, which is a corporate body formed initially by the four oil companies—Shell, Exxon Mobil, Chevron, and Conoco-Phillips—which have since been joined by BP. They've committed over \$1 billion to develop and have in place containment equipment similar to what was used on Macondo but that could be deployed almost instantaneously or within a matter of days and not weeks or months.

• (1135)

Mr. Alan Tonks: Okay, that's great.

I asked that question because I was thinking that you were thinking that containment was after the spill and thinking of how you contain it in a very wide range. I'm relieved that what you're talking about is the actual containment at the drill site.

Mr. Max Ruelokke: Yes.

Mr. Alan Tonks: My second question is from a National Energy Board perspective—and it's for whoever wants to answer it. Inasmuch as the experience has propagated the kind of intense technical and construction analysis from the gulf, is that information being fed into the post-event requirements when an application is made? Are we accelerating that kind of analysis and putting it on a trajectory to policy and to what is required when an application is received?

Mr. Gaétan Caron: Mr. Tonks, thank you for that question.

I can say unequivocally that yes, the safety offshore community of regulators, as we promote management systems—which is really a plan to review the learning loop—applies that philosophy to itself. Any incident like the one in the Gulf of Mexico is fed into our thinking process as we prepare for future applications.

In our case we have the privilege, Mr. Tonks, of actually having devised a process that will go to the bottom of things and hear from everybody about what containment looks like when it succeeds or what makes containment fail. As a regulator, we have to address the two scenarios: what if things go right and what if things go wrong? Those are things, honourable member, that we must look at before we even consider approving a well.

That's fed into the process; it will be fed into our Arctic review, and it is part of the ongoing journey of never assuming that we have done all that can be done to promote safety for the workers and communities. We must always assume that we can do more. That's the basic safety culture that we must promote with operators and that we must have within as a safety regulator.

Mr. Alan Tonks: Thank you for that.

Do I have just another minute or so?

The Chair: Actually, your time is up, Mr. Tonks. Thank you.

Mr. Alan Tonks: Oh, okay. Thank you, Mr. Chairman. Thank you to the witnesses.

The Chair: We go now to the Bloc Québécois, to Madame Brunelle, for up to seven minutes.

Go ahead, please.

[*Translation*]

Ms. Paule Brunelle (Trois-Rivières, BQ): Thank you, Mr. Chair.

Good morning, gentlemen. It is a pleasure to welcome you here.

Mr. Ruelokke, I found your presentation very interesting. The citizens of the Magdalen Islands, in Quebec, are very concerned. We are located only 80 km from your field, and this part of Quebec is very dependent on fishing and tourism. We are very close to your coast, only about 100 km away.

You are probably aware that a moratorium has been imposed on all operations until 2012. It has been imposed by the government of Quebec.

People are worried. We want to wait until an environmental and strategic study has been carried out. We want to wait until it is finished. The ecosystems of the Gulf of St. Lawrence are very fragile. The fishing industry is the main industry and it is very important for the population.

There is another concern. We see that Newfoundland and Labrador will get the benefits from this field. Some are wondering if Quebec oil will be pumped out. There might be some impacts, hypothetically.

I wonder why you are allowing Corridor Resources Inc. to operate instead of waiting until the Quebec strategic environmental assessment is finished.

• (1140)

[*English*]

The Chair: Mr. Ruelokke.

Mr. Max Ruelokke: Thank you very much.

Let me just explain perhaps what has occurred in the licensed area that contains the structure known as "Old Harry". It's an exploration

licence that was issued to Corridor Resources some time ago and is within the Newfoundland and Labrador offshore area only.

The only activity that has occurred to date is that quite recently, back in October, Corridor Resources carried out a geo-hazard survey, a shallow seismic survey to look at the sediments immediately beneath the seabed. There has been no application to drill a well, and if there is a plan to drill a well, then Corridor Resources will be required to carry out an environmental assessment of what the results would be of drilling that well.

But as I say, at this point in time we have not received an application to drill a well. When we do, we will require the environmental assessment to be done, and it will take into account all the property, all the area that is surrounding. And that's not only in the Newfoundland area, but it will take into account, for example, the fisheries you mentioned, which are so very important to the people in the Îles de la Madeleine.

There was a strategic environmental assessment done of the entire area that contains that licence back a number of years ago, and there was some cooperation at that time, of course, as there always is, with other jurisdictions. It was done before my time at the board, so I'm not personally familiar with it, but I do believe that it was comprehensive and that people from Quebec were engaged in that effort.

Again, just to recap, there has been no well drilled in that area, and there won't be one until an environmental assessment is done and unless an environmental assessment concludes that the well can be drilled without preventing undue hazards to the environment.

[*Translation*]

Ms. Paule Brunelle: Do you expect the preliminary studies to be carried out? When do you expect this drilling to be done, or receiving applications to drill?

[*English*]

Mr. Max Ruelokke: My understanding is that Corridor is actively seeking companies to participate with them in drilling an offshore well. Corridor does not have experience in offshore drilling; their primary experience is land-based in New Brunswick and Nova Scotia and in the exploitation of land-based oil and gas.

Unless and until they can find a partnership that would contain a company that would have the experience and the ability and the technical capability to drill a well, there won't be one drilled. But if they do that, then they have up until...exploration licences are set by the Atlantic Accord act as having nine years in length.

The accord provides that the first well should be drilled during the first five years of that licence. That five-year period is up until the January 15, 2013, I think. If Corridor were to drill a well, they would have to drill it prior to that time. At this point in time, they have not yet found a partnership that would allow them to do that.

[*Translation*]

Ms. Paule Brunelle: We have read in the papers that they are doing seismic surveys, among other things, and that this might create hazards for some large mammals. This would mean that they have been authorized to do those seismic surveys. It is what you are telling us, is it not?

[English]

Mr. Max Ruelokke: Yes, they did. They were authorized back in very early October—I think October 4—to conduct a shallow geohazard seismic survey. That was done, I believe, in the period from October 11 to October 16. A fisheries observer was on board to make sure all the appropriate procedures were put in place so that there weren't any marine mammals in the area when the seismic work was done and no fishing activity was interfered with. The survey has now been completed.

That survey was authorized by the board, yes.

[Translation]

Ms. Paule Brunelle: One last thing. You stated that, in case of a spill, there are three systems. You also said, unless I am mistaken, that you are able to face a spill of 150 barrels. That does not seem to be very much. Perhaps there was a mistake in translation.

In case of a major spill, you said it would be difficult to deal with large quantities of oil spilled in the ocean, such as we saw in the US, and that you have to do more research before having a more definite plan.

Last May, when we had some witnesses, we learned that relief wells are not being contemplated by the operators because they would be too expensive. Do you not think that it is much too early to give authorizations to the operators and that there might be a danger of having a spill but no solution? You are still at the research stage, if I understand correctly.

• (1145)

[English]

Mr. Max Ruelokke: I referred earlier to all the documentation and all the plans and procedures that companies have to have in place. I think there were two questions, and I'll answer the second one first.

The question was whether companies do all the work they should to prepare for emergencies that happen and whether there is some sort of cost analysis. We don't make any assessment of what it costs a company to be prepared. We do insist that they be prepared and that they demonstrate to us, through submission of detailed plans and procedures, that they are prepared to deal with any and all emergencies that arise. I refer to the contingency plans, emergency response plans, and oil spill plans; all of those are reviewed in detail by our experts and by experts in other agencies that we deal with.

With respect to the scenario of dealing with a large spill, you may recall that I referred to a three-tiered response. The tier one response would be for a small spill of less than 100 barrels. A small spill of this type can be adequately dealt with by equipment that is always available on site, and supply vessels are on the actual production installations. A tier two response would typically be capable of dealing with a spill of 100,000 barrels or less. Such a spill would be dealt with using resources that are available in Newfoundland alone. A tier three response, which is anything larger than 100,000 barrels or so, would likely require national and perhaps international resources. It would be similar to what was done in Macondo.

I think the one message I'd like to leave with you is that while the traditional spill response is still appropriate and still important, there

is much more focus on prevention of accidents. In the event that an accident happens, we will be looking at the containment effort that was successful with Macondo to see how that can be used in our own area, if in fact we have a situation in which it is required.

The Chair: Merci, Madame Brunelle.

We go now to Mr. Cullen. You have up to seven minutes.

Mr. Nathan Cullen: Thank you, Chair, and thank you, witnesses, for being here.

I'll try to keep my questions short, as I've got a lot to get through.

Mr. Ruelokke, was there a consideration of a pause in the Chevron drilling project once the BP spill had happened in the gulf? Did you folks contemplate putting things on hold until you had found out what had actually happened?

Mr. Max Ruelokke: Yes, we contemplated it, but we very quickly realized that all the proper procedures and processes were in place. Chevron had the right people and the right equipment. We permitted them to spud that well. I think it was probably some 20 days after the Macondo well blew out.

Mr. Nathan Cullen: I ask because the Macondo well was about 5,000 feet in depth. The Chevron well is much deeper—8,500 feet, give or take.

Mr. Max Ruelokke: Yes, that's correct.

Mr. Nathan Cullen: We know that the pressures and the factors that get involved do not produce a linear graph. It goes up exponentially the deeper you get. Without knowing what the mechanical and procedural failure was in the gulf, was it not inherently risky to approve? If some equipment that had failed in the gulf—equipment that everyone believed to be safe before the gulf spill—was also being employed by Chevron, was that not a risky decision that could have had some implications?

Mr. Max Ruelokke: I think there's a certain amount of risk involved in any decision regarding offshore oil and gas activity. It's how well that risk is understood and analyzed and assessed that allows you to move forward. In our case, we became aware fairly quickly that what had happened in the Macondo incident was a result of failure to adhere to proper procedures. There were all kinds of warnings about an influx of hydrocarbons into the well bore in the days and even weeks before the blowout, but for some reason they were ignored.

We looked at it in the context of the rig. That rig, the *Stena Carron*, had just finished drilling a well in the Laurentian Basin in the middle of the winter in water deeper than at Macondo. It was in 1,600 metres of water, so it was slightly deeper than the Macondo.

I spent time on that. I was very impressed with the skill and capability and safety culture in place on the rig. I had also visited her when she transferred over to Chevron, and the thing that really impressed me very much was the commitment that Chevron and the *Stena Carron* people had made to something they called their "stop work authority". That was about the most rigorous example of a positive safety culture that I've ever seen, and I've been in this industry a little over 30 years.

• (1150)

Mr. Nathan Cullen: Let me interrupt you for a second.

I believe you believed it was safe. I also suspect that the folks in the gulf thought the BP rig was safe in terms of regulators.

I'm going to turn to the National Energy Board for a moment.

Is the review you're conducting right now reviewing the leasing process that happens in the Arctic as well, Mr. Caron?

Mr. Gaétan Caron: No, it does not, Mr. Cullen. It's a policy matter in which the board is not involved.

Mr. Nathan Cullen: Okay. Does it review the east or west coast?

Mr. Gaétan Caron: No.

Mr. Nathan Cullen: Is there review of the the tar sands operations, or shale gas?

Mr. Gaétan Caron: No, there is not. You're correct.

Mr. Nathan Cullen: Am I right that the intervenor funding that's available is for travel, but not for research?

Mr. Gaétan Caron: You're correct.

Mr. Nathan Cullen: Does that not potentially create a David and Goliath scenario in which the oil companies—

Mr. Gaétan Caron: I misheard a few words; I apologize.

Mr. Nathan Cullen: Does it not possibly create an unfair discussion, seeing that the energy companies, the oil companies, have a great deal of resources for research, but the intervenors—the first nations, the local citizens—would not have access to any of that type of research, or to lawyers or background information? Is that not a concern to the NEB?

Mr. Gaétan Caron: What is of concern to the NEB is to hear what people have to say. For that reason, we will be travelling to every northern community that wishes to speak with us.

Mr. Nathan Cullen: I think your access is great and commendable in terms of getting out, but people need to have information in order to contribute positively. Has the NEB considered intervenor funding to allow people to do some of the research that's required? Certainly the oil companies will be doing theirs.

Mr. Gaétan Caron: Thank you. I understand your question better now.

Under the NEB Act, for pipeline hearings we do have the legal authority to have participant funding. That includes research. Under COGOA, the Canada Oil and Gas Operations Act, we do not have the legal authority. We're doing all we can within these constraints to be reachable.

We've also invited people who would like to see research done to write to us with suggestions as to what this research could be. We've given people until the end of November to make those suggestions as a means of making information people believe is relevant available to them and to us at the same time.

Mr. Nathan Cullen: The answers to those questions show that this would not be a “thorough review and revision of all federal laws, regulations and policies regarding the development of unconventional sources of oil and gas, including oil sands, deep water oil and gas recovery, and shale gas”. That's not what you're doing.

Mr. Gaétan Caron: What we are doing is as broad a review as we feel is necessary within our mandate. We are doing no more than that—

Mr. Nathan Cullen: So you are doing none of those other components.

Mr. Gaétan Caron: Within our mandate, we went as broadly as we could, Mr. Cullen. There's no question that we're not asking, which we will have to face one day if an application is filed and if we have to deal with that.

Mr. Nathan Cullen: The reason I ask is that what I just read was part of a motion that was passed unanimously in the House of Commons, asking for a review of all those other aspects. That's not what you're doing.

Mr. Gaétan Caron: As we understand it, we're not part of the policy arm of government. We're doing what the board members of the NEB—an independent, quasi-judicial administrative tribunal—have decided to do to deal with our mandate, which is broad enough already.

Mr. Nathan Cullen: I'm surprised, Mr. Caron, that in your testimony.... We had you before us, and the other gentleman here, and I asked a very specific question about how long it would take to drill a relief well in the Arctic. You've since written me a letter trying to confirm that.

When I asked you that specific question, you told me you didn't know and didn't have that information. Then we found out later what your briefing notes specifically said. It was in an exchange on a question, which was “How would a same-season relief well work in the Arctic environment?”, which was essentially what I asked you. In your briefing notes, it says:

The wells that are being planned are anticipated to take three (3) seasons to finish. The actual drilling time is about 100 to 120 days but ice conditions and vessel capabilities mean that an operator would likely not have a continuous period to drill a well, hence multiple seasons well.

Would that not have been the honest answer to my direct question?

Mr. Gaétan Caron: The honest answer to your question was the one I gave you, honourable member.

Your question, verbatim, was:

Is it possible to have an oil operation in the Arctic in a predominantly ice-filled environment and have same-season relief wells also available to a company?

The chair asked me to be brief. The short answer could have been “yes”, if I relied on the fact that it is possible, because in 2005 Devon had that capability approved by the board. They had same-season relief-well capability available to intervene and kill the well within 60 days.

Had I had time, I could have added that if you go up north, in the Arctic islands, the ice is permanent in some areas. And if you drill from a permanent ice structure, you'll have a situation where, from a relief-well standpoint, you're essentially in the same place you would be with onshore drilling. In that case, again, the answer might very well be yes, but I would be reluctant to tell you yes today because it hasn't been tested.

As we go, I understand, but—

• (1155)

Mr. Nathan Cullen: Do you see why this was confusing and potentially misleading?

The Chair: Mr. Cullen, let him complete the answer. He's certainly trying to do so in a concise fashion.

Mr. Gaétan Caron: I'm nearly done, Mr. Chair.

If you go in between, so that for drilling a well you have a season and you're constrained by a season of three or four months, depending on the kind of environment you face or the kind of drilling rig you operate with, whatever level it is certified to, you may be able to drill a well in one season, maybe two seasons, or maybe three seasons. That's what the briefing notes you referred to said: to drill a well—not a relief well or any well—can take up to three years. So the board requires, as a matter of policy, that there be same-season relief-well capacity.

Mr. Nathan Cullen: Not at all.

The Chair: Mr. Cullen, your time was up before anyway. You're a couple of minutes over.

Mr. Nathan Cullen: We'll do another round.

The Chair: You will get another round.

We'll go now to the government side, to Mr. Allen, for up to seven minutes. And that will complete the initial round.

Mr. Mike Allen (Tobique—Mactaquac, CPC): Thank you, Mr. Chair, for the opportunity.

There are just a couple of things I want to follow up on in regard to Mr. Cullen's questions.

Mr. Caron, thanks for that clarification, because the letter writing that was going on was sort of like a grand inquisition against your comments. So I'm glad you clarified that today.

There is another comment I would like to follow up on. Mr. Ruelokke, you started talking a little bit about the safety culture. I think it was Chevron you were talking about. Also, in your comments, you talked about a billion dollars being spent by these major companies on the advanced undersea containment technologies. I have a couple of questions on that. Has there been any output from some of that analysis that's being done? And when would you expect some output on the billion dollars that will be spent by these major companies on undersea containment? Just as a follow-on to that, to both Nova Scotia and Newfoundland, what would you see as some of the key lessons you, as regulators, have learned from the Gulf of Mexico experience?

Mr. Max Ruelokke: Thanks for that question.

I'll start off with the containment effort. The exercise commenced in July. They were joined by BP just about a month ago, so it's still early stages. Most of what they're doing at this point, we think—even though we're not actively involved, and it is being done within the companies—is reviewing what was done, basically the lessons that were learned, if you like, from the Macondo, because that was the first well for which that kind of major subsea containment effort was mounted.

We will engage in that in a couple of ways. My two colleagues have mentioned the International Regulators Forum, of which we are a very active member. The regulator in the U.S. is the Bureau of Ocean Energy Management. Actually we met with the director of that bureau when we were out in Vancouver several weeks ago at our conference, and we meet with his operational staff and discuss a variety of issues. So we'll stay involved and stay up to speed with it through their efforts, because this is basically being done, as we speak, inside the Gulf of Mexico.

The second way we'll get involved in that is that when companies prepare for us an emergency response plan for a new deepwater exploration well, we will require them to address the containment effort they will be able to exert, including where they would get the resources to do that, as part of their emergency response plan. That is something that hasn't been done up until now. That was very much a lesson learned for us. I suspect the lesson will be applied in the same way by our colleagues in Nova Scotia and in the National Energy Board.

The other question you asked, I believe, was what we are doing about lessons learned. One of the things we have learned is that in the Macondo incident, it wasn't so much a matter of regulations not being in place. It was that there wasn't an appropriate safety culture, and we don't think there was an appropriate amount of oversight of what was going on, so a number of things that were done were well outside normal practices.

There were a number of opportunities for intercession that would have been successful if they had been taken earlier to prevent the incident, but for some reason.... We really don't know the reasons yet.

Some of you may be aware that BP came through the Department of Natural Resources to Ottawa and met with all of us to make a presentation on the Macondo incident about three or four weeks ago. They did a three-part presentation for us. There was a gentleman who was part of the engineering investigation team. He talked very frankly about the things that had gone wrong and where they could have been stopped. Another gentleman talked about the containment effort, and the third gentleman talked about the spill response effort. The lessons learned have been that we have good regulatory regimes in place, and our operators have appropriate safety cultures and appropriate practices and procedures, but one lesson is most important in all these incidents. And I've been involved. My company had crew members on the Ocean Ranger. We lost five of our workers there. None of these incidents have happened as a result of one thing going wrong and causing the disaster. They've always been a result of a number of things that of and by themselves would not have led to such tragic consequences, but when they line up, when they occur one after the other after the other, then you get into that kind of situation.

The best way to prevent that is by adopting and imposing an appropriate safety culture. I'll use just one small example: the stop-work authority I referred to. Everybody on a drilling installation that Chevron runs has the ability at any time to stop any work they see ongoing if they believe it is unsafe or if they believe it could lead to an unsafe condition.

A week and a half before the Macondo blowout there was continuous remotely operated vehicle monitoring of the blowout preventer stack and the marine riser. It was noticed that there were bubbles coming from one of the control pods in the BOP stack. That's a no-no. That shouldn't happen. That means something has gone wrong. But it was ignored. Nobody did anything about it. If somebody had said "We have to find out what's wrong there".... It would have been an expensive effort. In that deep water it would have taken a number of days to pull the marine riser and to pull the BOP stack and inspect it to see what had gone wrong with it. It might have cost \$10 million or \$15 million. What a marvellous investment that would have been to avoid the catastrophe that happened. A safety culture can stop that.

That's where we're really exerting our maximum efforts, and our operators are making sure we have an appropriate safety culture on every installation in our area.

I could talk about this for a long time. I won't. I'll let it go at that.
● (1200)

Mr. Mike Allen: Maybe Mr. Pinks can deal with that, but you talk about that safety culture, and you're right. I agree that's important. But at the end of the day, it's still up to that employee or still up to that individual. How can you blend that into your regulatory effects to make sure that the company has actually carried it out and that the employee feels safe doing that?

Mr. Max Ruelokke: Do you want to...?

The Chair: Yes, Mr. Pinks, go ahead please.

Mr. Stuart Pinks: I was going to say that we probably all recognize that safety culture is what will drive continual improvement. Really the lesson for us as regulators—and this was discussed at some length at the International Regulators Forum—is how we can promote safety in the offshore and hold operators accountable for continuous improvement; in other words, move past a compliance regime to a continuous improvement regime.

Our new drilling and production regulations really bode well for that sort of approach. They allow us to hold operators accountable for always recognizing and understanding the best practices and best standards for undertaking their work and adopting those in the work they do.

The IRF is a collection of regulators from eight countries around the world—or actually nine, now that Mexico has joined in. Collectively we identified a strategic agenda of issues. We felt that if we focus on certain activities when working together and then working individually within our own countries and our own jurisdictions, that would really drive the continuous improvement and drive the improvement in safety culture.

I will echo Max's comments that the safety culture I've experienced in my work in Nova Scotia—and I also worked previously in Newfoundland—really measures up against some of the best in the world. There really is a good strong safety culture in our offshore—and, I believe, in the Newfoundland offshore as well.

The Chair: Thank you, Mr. Pinks.

Thank you, Mr. Allen. Your time is up.

We go now to the second round, for five minutes, starting with Mr. Andrews.

Mr. Scott Andrews (Avalon, Lib.): Thank you, Mr. Chair.

I have a couple of questions and I'll address them to Mr. Ruelokke.

We've talked about response and we've talked about tier one and the operator's response being the first line of defence on a spill. We've now looked at and reviewed all of this since the BP blowout, and I assume we've made some recommendations to these companies to change their response plans and update their response plans. Obviously, their response plans were applied for when they first applied for drilling offshore. What's the timeline, if any, for the implementation if they end up changing these safety plans and responses?

● (1205)

Mr. Max Ruelokke: Actually, we haven't identified any shortcomings in the plans that have already been submitted. From the point of view of our production operations, we have a three-year cycle of operations authorizations. For example, in the case of the Hibernia field, its operations authorization will be due in late fall of 2011. All those plans will be revised on a three-year basis. There's a response plan for each new well being drilled, but for a production operation, as I say, it's on a three-year rotating basis.

We continually review and assess lessons learned, but we haven't seen any shortfalls or any shortcomings in the response plans. So we haven't asked them to update them. For new exploration wells, as I mentioned earlier, we'll be testing them on subsea containment. That is not something that's been addressed up until now, but it certainly will be addressed going forward.

Mr. Scott Andrews: Okay.

Another tier of response that you didn't mention is the Canadian Coast Guard. What role would they play in response to an oil spill? In your opinion, is the Canadian Coast Guard well equipped to respond? How well do you think they are prepared to respond? Could there be any improvements? Are there any shortcomings with the coast guard?

Mr. Max Ruelokke: I must confess that I'm not totally up to date on what the coast guard has. For a number of years, just because the gentleman who was running it was a close personal friend of mine, the emergency response supervisor, we would socialize and I would see what they were doing as I visited his office. They certainly have the capability to supplement what the operators do through the Eastern Canada Response Corporation. They have very similar fleets of equipment. One of the things the coast guard has and the Eastern Canada Response Corporation doesn't have, of course, is a stable suite of vessels that they can deploy instantaneously. Within an industry response, the industry would use the supply vessels they currently have and perhaps bring in some others. But those supply vessels are normally equipped to handle just a tier-one response. A tier-two response would require them to come into St. John's and load up equipment from the ECRC and then carry it out.

Mr. Scott Andrews: Would it be worth our while to speak to the coast guard on their response and how they've improved?

Mr. Max Ruelokke: I'm not absolutely certain, but I believe the coast guard appeared before this committee some time just before or after we appeared here in May.

Mr. Scott Andrews: That was prior to me being on the committee.

When you talk about ECRC, how quickly can they respond to a spill? Have they done any analysis of their response time and their capabilities since BP?

Mr. Max Ruelokke: Yes, and I think ECRC may have been before the committee as well. I'm not absolutely sure of that.

They have an annual field exercise that the operators conduct, but ECRC is involved in it. That happened in October—the synergy exercise. I know they're involved with Transport Canada, through discussions I've had with Transport Canada, because ECRC has responsibility for ship-based spills other than oil and gas production operations—for example, from tanker traffic. I know that Transport Canada has had a number of discussions with them about supplementing and adding to the equipment they have, and they have a plan in place to do that.

Mr. Scott Andrews: You talk about oversight and the CNLOPB. You referred to the recent deep-water drill that was done, and observers on board from the CNLOPB. During that period of the deep-water drill, did you have observers on board? In the future, are you looking to have observers on board all production vessels, 24/7, 365 days a year? Can you tell us what you did when the deep well was drilled on—

Mr. Max Ruelokke: We make routine inspections and audits, but we don't have anybody permanently on any of the facilities. We deploy our staff on the basis of a risk analysis, so those areas or activities that we think might be higher risk than others get more interest and more oversight.

If I can refer specifically to the question you asked about what happened on the *Stena Carron* during the drilling of the Lona-055 well, we had developed a plan of additional oversight and advised Chevron, the operator, that we were going to do that. That meant we had an observer on board at critical phases during the drilling of the well.

Prior to the actual undertaking of those critical activities we had what we call an operations time-out. So we made sure in a formal way, with the operator and the well contractor, Stena, that all the equipment and procedures were in place to deal with whatever happened at the next phase of the well.

It's an exploration well, and the information that comes from it is confidential for two years, but I can tell you that with any exploration well, one of the areas you're going to be interested in from the point of view of safety and environmental protection is when they're entering target areas in the substrata that they believe may contain hydrocarbons.

So before a target is entered we have an operations time-out to make sure they are prepared in every way to deal with what they find in there. If there is a pressure increase, how will they deal with that? Is their equipment capable of doing that? Do their people have the appropriate training and certification? All those things were done on an ongoing basis during the drilling of that well.

We apply that same kind of oversight to any well, especially exploration wells. But we don't have a plan to put anybody on each rig on a 24/7 basis.

• (1210)

The Chair: Thank you, Mr. Ruelokke.

Thank you, Mr. Andrews.

We now go back to the government side and Mrs. Gallant for up to five minutes.

Mrs. Cheryl Gallant (Renfrew—Nipissing—Pembroke, CPC): Thank you, Mr. Chairman and witnesses.

Are offshore oil companies required to contribute to a liability or legacy-type fund the way nuclear companies must have a certain amount set aside as insurance for an accident, or a specific dollar amount in an account for legacy issues?

Mr. Max Ruelokke: The oil companies are required to submit to us demonstration of financial capability to deal with anything that might go wrong or occur with the well. In our regime it would be similar to what happened in the Gulf of Mexico. The operator has full responsibility for any costs associated with that.

On the only kind of legacy involvement, in Newfoundland and Labrador we implemented research and development education and training guidelines in 2004 that require the companies to spend a certain percentage of their through-put on research and development education training. That's decided on a kind of a rolling-average basis. That effectively means that the three production operations we have in Newfoundland and Labrador at this time will collectively invest about \$30 million on an annual basis in research and development or education and training.

Mrs. Cheryl Gallant: Okay, so if there were a spill, there's not money sitting in a fund somewhere that could be distributed to victims; they would have to go through the legal process of suing.

Now, NORAD is working on a maritime component. Is the critical infrastructure that you regulate—and I would consider a deep-well oil rig, or any oil rig that's functioning, to be critical infrastructure—on NORAD's map? Is there a timeline of communication in case there is a security breach, and a measure that must be taken?

Mr. Max Ruelokke: I'm not aware of NORAD's overall activities related to offshore facilities, but Transport Canada has a requirement for security of marine assets. It conducts a regular audit of each of the installations to ensure they have appropriate security measures in place, both on the facility itself, as well as on the shore-based facilities they use for support.

Mrs. Cheryl Gallant: Okay.

This past summer there was an inter-agency exercise called Operation Nanook. It was executed in Canada's Arctic. It was mentioned that the eastern oil offshore companies have their own assets but that if something were to happen in the Arctic we would depend upon government sources.

I'm wondering whether your agency was involved at all in planning scenarios. If there was an accident or some emergency on one of these deep oil wells that is being planned for the Arctic—or even a tanker, for that matter—was there something built into that exercise so we would be better prepared in case of an actual emergency?

•(1215)

Mr. Gaétan Caron: Mr. Chair, with your permission, Dr. Dixit probably has better first-hand knowledge than I do about the activity you refer to.

The Chair: Go ahead, Dr. Dixit.

Dr. Bharat Dixit (Team Leader, Conservation of Resources, National Energy Board): The question is really around whether our board was participating in some of these northern exercises, and the answer is yes. We were very much a part of the exercise preceding this one. The operation that was conducted was called Narwhal, and we had a hand in defining the scenarios.

In Operation Nanook, we weren't as much in front as we were in shaping what the scenario was, but we were very much involved in the planning and monitoring of that exercise.

Mrs. Cheryl Gallant: That's quite encouraging to hear.

Now back to the BP spill: were any of the measures that failed to plug the well measures your boards would have deemed to be an acceptable part of a company's emergency response plan should such a spill have occurred in Canadian waters?

Mr. Gaétan Caron: I'll go first, Ms. Gallant.

What we will find about that very question will be the result of our reading the January 2011 report that was published by an independent commission asked for by President Obama.

I will quote Professor Mark Fleming, from Saint Mary's University, who spoke at the IRF conference in Vancouver two weeks ago. He said—and that was the best learning for me in Vancouver—accidents happen because people don't do what they're supposed to do.

That goes back to the point Mr. Pinks was making, that management systems must exist. We, the regulators, must hold industry accountable for not only there being a documented management system, but to improve continually, by verifying through audits that the CEO is committed, the working levels are committed, and when people at the front line see a safety flaw, they talk about it.

The one thing I'm learning from the gulf so far, based on what I've read—and we've read only a small part of what we're going to know in January—is the safety culture aspect. This board would be inside the tent of the culture that would prevail in an offshore drilling rig, and we would know if it isn't there. We have the power to stop operations if we find it that way.

Mrs. Cheryl Gallant: Very good.

Does Canada have any containment technology that was not deployed in the gulf, either at the wellhead or in the outer perimeter of the spill?

Mr. Max Ruelokke: Not that I'm aware of. Had there been equipment available in Canada, or anywhere internationally, I think it would have been deployed. There was a huge influx of resource into the Gulf of Mexico to attempt to deal with that spill, from all over the place.

The Chair: Thank you, Ms. Gallant.

We go now to Mr. Pomerleau, for up to five minutes.

[*Translation*]

Mr. Roger Pomerleau (Drummond, BQ): Thank you, Mr. Chair.

I want to thank the witnesses for meeting with us today.

As a complete layperson about these matters, my question will be similar to my colleague's, Mr. Allen.

In the mind of the public, British Petroleum, a well-known, rich and serious corporation certainly had appropriate safety equipment to drill. It certainly had trained personnel. It had an emergency plan. There were emergency procedures that were well known. It certainly had international contacts in case of major problems, like all big corporations have. It obviously had lots of experience and a lot of data collected over the years about what might happen.

Despite all that, there was a blowout that lasted for several months and, today, according to media reports, the most recent estimate of the cost of the operation is \$40 billion, which may not even be the final amount.

At the National Energy Board, you talk about strengthening your regulations. What makes you so sure that you will be able to set up something better than all that, especially in relation to the Arctic — which Mrs. Gallant referred to — since drilling in the Arctic is a whole other kettle of fish, a more complex and dangerous proposition, I believe?

•(1220)

Mr. Gaétan Caron: Mr. Pomerleau, I agree with you about all the things you have mentioned. As a new member of the committee, you ask very relevant questions. I would not dare tell you that I am sure about anything except that one must always be very careful.

I want to tell Canadians and Quebeckers that we have a regulatory regime that is focused on three things.

First, we have to do all we can, as regulators, on matters of safety and the environment to ensure that any drilling is done safely, that the environment is protected, and that the native communities are protected since they would be the first victims of any incident. However, I cannot give you any guarantee that there will never be an accident. Canadians should not believe that accidents would never happen.

As to the second step of regulatory process, if there were to be an accident, even if that probability is very low, the consequences would be very significant. So, we have to be prepared, as regulators, to ensure that the operator, helped if necessary by civil society, by the departments and the public agencies, has taken all the steps required to make sure that, in case of an accident, we would be able to contain and stop the event as quickly as possible.

The third step is to believe that we can always learn and do better. So, I can tell Canadians that the regulatory agencies will never be satisfied with existing regulations and will always try to find the additional measures that could be included in a process that, by definition, is aimed at always improving what we do.

Finally, as regulators, we work at arm's length from the government. We are not involved in policymaking. That being said, there is a process that we follow. If an application were to be received — we expect that we may receive one in 2012 or later — for drilling to start in 2014 or later, our role would be to look at it objectively to see if it meets all regulatory requirements and standards. Even if the operator were to tell us that everything will be fine, our reaction would be to ask how, in case something went wrong, we would be able to use all the infrastructures required to face the issue appropriately in the public interest.

Our public Arctic review is precisely aimed at answering the important question you have asked.

Mr. Roger Pomerleau: Mr. Pinks and Mr. Ruelokke, do your Boards intend to go as far as that in reviewing your own regulations, in your own fields?

[*English*]

Mr. Max Ruelokke: We've just concluded, as one of my colleagues mentioned earlier, a new set of drilling and production regulations that came into effect the first of January this year. We've reviewed those; they were obviously put in place prior to the incident in the Gulf of Mexico happening. We've reviewed those, and to this point—and they are regulations that we all have, the three boards share, and the three governments—we have not identified any shortcomings or any changes that are necessary in those regulations because of what has happened in the gulf.

Having said that, ongoing review of regulations is a matter of the course of business for all the boards, and we each have a responsibility, in fact, to provide advice to governments in the event that we see things in the regulations that need to be changed. But to this point, we haven't seen anything in the new regulations that we need to change.

The Chair: Merci, Monsieur Pomerleau.

Mr. Pinks, you had something to add briefly?

Mr. Stuart Pinks: I was just going to add that I agree with what Mr. Ruelokke has communicated. Our boards—all three boards, actually—assist in providing technical advice to the governments on drafting regulations. As you're aware, the drilling and production regulations have been updated. There is work being done. There is a full suite of regulations under the accord act. Seven or eight of them have been promulgated, and some of them are on the older side—they were promulgated back in the 1980s—so we're looking at those as well.

There are definitely lessons learned from things like the Deepwater Horizon incident. There was a similar type of incident in Australia a year earlier. Learning from major incidents like that will be taken into account as we provide advice to governments. Governments write the regulations, but we provide the advice to them.

The Chair: Merci, Monsieur Pomerleau.

We go now to Mr. Shory for up to five minutes.

• (1225)

Mr. Devinder Shory (Calgary Northeast, CPC): Thank you, Mr. Chair.

Thank you to the witnesses for coming and sharing their information on the subject they specialize in. Of course this is one of the subjects I might not have come across if I were not an elected member and a member of this committee, so thank you for sharing this information.

I understand that our government is of course committed to the safe and sustainable development of natural resources, which of course involves offshore drilling as well. I also understand that these are all arm's-length regulators; they have strict guidelines; there is an application process in place; there are some requirements for strict training; and the applications have to satisfy the regulators even before they can move to the next step.

I believe we as Canadians are all concerned with what happened in April in the U.S.A. with the oil spill and with whether we are prepared for that kind of an accident. That is a key question I myself ask. I also know that following that accident, the NEB announced they will be doing some review of our active drilling process.

My question is threefold. What does NEB wish to achieve from that review? Is there any chance to make any changes or amend the current regulations if required? And when do we expect any review to be finalized?

Mr. Gaétan Caron: Thank you, Mr. Shory.

Our expectation is that by the the end of phase three, with the publication of a public report, we will very clearly specify what operators must submit to us in the future in order to persuade us to approve an offshore well in the Arctic. So it is about the information they will be required to file with us to seek to persuade us.

As you know, Mr. Shory, as an independent quasi-judicial administrative tribunal, we have all the legal powers to say yes or no to an application to drill a well, based on what the industry submits to us. And if we say yes, we have every power to impose the conditions that the National Energy Board finds are appropriate for that well to be drilled safely, to protect the environment and to protect communities.

Fortunately, when Parliament passed the Canada Oil and Gas Operations Act, the purpose of the act was stipulated in the preamble to the act. So as independent board members, we are guided and in fact bound by the act, which says we look at three things: safety, environment, and conservation of the resource, so that when you develop a resource you don't waste it. A fourth item was added recently: open access. When there is a pipeline, the public interest requires this pipeline to be shared so that you don't build unnecessary facilities.

So that is what we hope to achieve, Mr. Shory. It is to have public debate, public input, people asking each other questions. The end point is what applicants will be required to file with us to seek to persuade us to say yes to an application to drill a well.

As for whether regulations would need to change, the process of deciding to change regulations is a policy gesture, so we have Ottawa departments to work on policy. And as Mr. Pinks said, we are always there to provide technical assistance when there is a need. We have broad powers under the regulations we have now. Given those, we are not doing this review with the goal of seeking to amend the regulations, but if we find something meaningful in terms of improving the framework, the policy world will be involved in our review. We have major Ottawa departments registered in our review—DFO, NRCan, INAC, and I'm missing quite a few—and they'll decide whether they want to initiate regulatory action and will provide technical assistance if they so decide.

When will this be? Our answer so far, Mr. Shory, has been that we're going to take the time to do it right. Phase one is in progress and cannot possibly end until the report from the independent public U.S. commission is complete. And if people still have things to tell us, we'll keep listening to them.

Phase two is about asking each other questions. It will start in the spring and will presumably take several months. We haven't affirmed a date, Mr. Shory, and with your permission I will not give you a date, because our commitment is to do it right.

Mr. Devinder Shory: Absolutely.

The Chair: Thank you, Mr. Shory. Your time is up.

We will go to the final round, three minutes each, starting with Mr. Tonks.

• (1230)

Mr. Alan Tonks: Thank you, Mr. Chairman.

Mr. Ruelokke, hypothetically and from your knowledge of the industry, in an application for a specific deep-water drilling proposal, do you believe a specific capping and containment technology should be mandated in the response regulations through the NEB or the appropriate vehicle, and is a relief technology required with a specific capping? In other words, from your experience, could you ever envisage that we would reach that point, that we would have a technology that would be mandated through the legislation? Could you comment on whether a relief or something similar to it, in terms of relieving the pressure while the containment initiative was taking place, could be done under safe circumstances?

The Chair: Mr. Ruelokke.

Mr. Max Ruelokke: Thank you, Mr. Tonks.

What we would always want to see deployed or available, or being readily available to be deployed if required, was the best available technology. I think that's what this company, the Marine Well Containment Company, is moving toward, advancing the state of the art in terms of the best available technology.

The emphasis always is and always will be, of course, on prevention, on making sure that the barrier system that prevents any hydrocarbons from uncontrolled release into the environment is robust, sound, and solid. It was a failure of the barrier systems that permitted the Macondo blowout. It was a failure of the barrier systems that permitted the Montara well in Australia to blow out.

But the specific question you ask, whether we would mandate a certain kind of technology, I think we'll be moving toward that. As I

said earlier, we'll obviously watch it very closely as it is developed and we will want to make sure that the wells that are going to be drilled in our jurisdiction have the same kind of support and... I'm struggling for a word here. I'll just go on without that word. We want to make sure that if something is currently available, let's say in the Gulf of Mexico, it would be available in our area, if need be. The best available technology will have to be deployed.

Mr. Alan Tonks: Wouldn't it require a relief well to—

Mr. Max Ruelokke: No, it wouldn't require a relief well. The problem is a relief well—not a problem, it's a fact—will take a long time to be successful. There has been a lot of discussion about drilling a relief well simultaneously with the original well. The problem there is that any time you start to drill a well you have to know what the target is. You don't know where the target is because you don't know if a blowout is going to occur on your exploration well, where in the well that will be, and therefore where your relief well should be targeted. The other thing that we always have to bear in mind about relief wells is that drilling another well presents an additional set of risks. Every well is risky to some degree, and you're doubling the amount of risk if you have to drill two wells for every well you're going to use to explore or produce.

The Chair: Thank you, Mr. Tonks.

We go now to Mr. Harris, for three minutes.

Mr. Richard Harris (Cariboo—Prince George, CPC): Thank you, Mr. Chair.

Thank you, gentlemen, for your testimony today. I'm hearing once again from you basically what we heard last May, I guess it was, and that was that the design, the technology of the equipment that's being used—in our case, deep-sea drilling—is state-of-the-art equipment. You seem to be repeating what you said back in May, that accidents happen when the operators of the equipment fail to either use it properly or disregard possible hazards that develop or were already present in the environment the equipment is going to operate in.

On the equipment itself and the methods of drilling, they're studied seven ways from Sunday, but as I think you said, Mr. Caron, accidents happen when someone does something they're not supposed to do or disregards a possible hazard. So that's human error and that's what causes a lot of accidents, not just in the welling industry.

So I'm really pleased to hear about this culture of safety regime that the industry has gone into. That is, in a way, operating beyond the regulations that are already in place. And on this stop-work authority, as I understand it, if anybody on the drilling rig notices something, they have the authority under this new structure to shut the thing down and explain why they did it later. They can take that step singularly.

•(1235)

Mr. Max Ruelokke: That's correct, and where it's in place—and it's not in place for every operator, but we will certainly endeavour to see that it does become in place—it's not just an authority that you have to stop the work, it's actually a responsibility you have. If you see something that you think is unsafe, even though it's beyond your technical realm, if you believe it's unsafe, you have a responsibility to stop it.

When you go offshore for the first time on a particular installation, you'll be given a fairly intense orientation. I did that twice on the drill ship I'm referring to, the *Stena Carron*, and both times, the main emphasis in the induction was all about the stop-work authority and what that actually meant and what your role as a worker was in making sure you did that if you had to.

Mr. Richard Harris: Mr. Caron, it's my understanding, from what I'm hearing, that when there's an application for drilling, the aspect of how a spill or a leak would be mitigated is given absolutely the same priority as the actual operation. You're going to drill. How are you going to do it? You have to answer all the questions, but if anything happens, the mitigation is given the highest priority as part of the decision-making process.

Mr. Gaétan Caron: Yes, I wish to confirm that, sir.

I would use the word “redundancy” in everything we do. There is redundancy in terms of blowout preventers that are built into that piece of equipment, but look at the whole regime, sir, as requiring redundancy. That's the way our Arctic review is structured. What do you need to do, industry, to do it right?

Question two: What do you do when things go wrong? See what we can learn from past accidents: *Piper Alpha*, in the eighties, an Australian incident that we're monitoring. There will be a public report before Christmas. That is as unexplainable, if you like, as the Gulf of Mexico, because of human error. Of course the Gulf of Mexico.... This creates a body of knowledge that creates breakthroughs in the way regulators regulate safety.

Mr. Richard Harris: Thank you very much.

The Chair: Thank you, Mr. Harris.

Mr. Anderson, for up to three minutes.

Mr. David Anderson (Cypress Hills—Grasslands, CPC): I actually would like to go back to this issue of redundancy. I think when we here in the spring there was some explanation of what's required on an offshore rig in terms of redundancy, but I'd like you to just cover that again. I understand there is double, triple redundancy. The problem in the gulf seems to have been that they had started with bad cement work and then it impacted the blowout preventer. Could you go through what is required? And then we'll move on to another question.

Mr. Gaétan Caron: Dr. Dixit has something to say on that, sir.

Dr. Bharat Dixit: A similar question was asked when both Mr. Caron and I appeared before the Senate a couple of days ago. The key message I want to transmit here, using blowout preventer as an example of what we're talking about, is that we're looking for redundancy, we're looking for reliability, and we're looking for capability. Where we have the possible identification of hazards, we would look at all these aspects and at what we're going to be doing

regarding those hazards. When that's the case, we look at these three aspects. Are they adequately covered? Only when we're satisfied can we move forward.

Mr. David Anderson: In terms of capability and training, then, what training is either required or provided? If someone is on the rig and sees a situation, what typically would the person have in terms of training and education?

Mr. Stuart Pinks: In general, there's a training and qualification document that's been put together for use on the east coast. It identifies all the different types of training for all the different types of positions. Those are minimum requirements. The companies themselves will have a look at them, and they'll adopt those plus have internal training as well. That document is a living document and is continually reviewed and revised to drive up the standards for training and competencies.

•(1240)

Mr. David Anderson: I wish I had a little bit more time here.

I'm just wondering if you have anything further to say about the five priorities of the strategic agenda set at the conference of regulators forum that you folks were part of. Anybody can answer that.

You identified safety culture, blowout prevention, performance indicators, operator competency, and use of standards. I'm just wondering if anything stood out at that forum that has really come forward.

Mr. Stuart Pinks: I think safety, culture, and leadership is probably number one. Collectively, as regulators, we want to figure out how we can deliver a message back to the industry. Industry operates the facilities. It's industry that's taking the risk. It's industry that's in business. Our role as a regulator is to figure out, from a safety culture perspective, how we hold operators accountable to continually improve safety culture. One of the measures we're going to use for going in and assessing that they have a reasonable safety culture and that it's working and is steadily improving....

Mr. David Anderson: Where are you going with that, then? If that's the most important thing you've identified, where would you like to go?

Mr. Stuart Pinks: As I said, at the meeting in Vancouver, we identified five top priorities. Another one is blowout preventer integrity and operational issues. We have a work plan in place to have something that all regulators—members of the IRF and others—can use to zero in on that. We're hoping to have that by the end of December.

What we've done is put teams together for each of the five agenda items. The teams will draft their terms of reference and a plan of attack and a schedule. So it's a little bit premature to say that we're going to have something by date *x*. It's very much something that has just kicked off.

The Chair: Thank you, Mr. Pinks, and thank you, Mr. Anderson.

Finally, for the last round of questioning, we'll have Mr. Cullen, for up to three minutes.

Mr. Nathan Cullen: Thank you, Chair.

Mr. Ruelokke, just quickly, the CNOBP put additional requirements on Chevron to report on the findings and their own lessons learned from the gulf. I know that Mr. Harris has had some correspondence with you. Have they given you any of those findings?

Mr. Max Ruelokke: We haven't received, to my knowledge, anyway, any from Chevron on a formal basis. We had ongoing discussions with their drilling team during the course of the Lona O-55 well and shortly thereafter. They assembled for that well the best expertise they had available within Chevron. They had colleagues who were involved in the BP incident....

Mr. Nathan Cullen: But specifically, there is nothing formal yet, such as paper documents.

Mr. Max Ruelokke: No.

Mr. Nathan Cullen: Are you going to make those public if you do receive them from Chevron?

Mr. Max Ruelokke: It depends on the information the operators give us. If it contains proprietary information, we have to seek their permission to release it. We would certainly do that.

Mr. Nathan Cullen: Mr. Caron, the specific note you had, and this is an important part of it, said that the wells being planned are anticipated to take three seasons to finish. I wasn't talking about speculative wells. I wasn't talking about imaginary ice-blocked wells or ice-based wells. You know I was specifically speaking to the idea of what's being planned in the Arctic right now and how long it will take to drill a relief well in those places.

Your briefing notes say that the wells being planned will take three seasons. You could have said that. You could have articulated that the wells being planned will take three seasons. There are other wells not being planned that may be able to be done during the same season. Would that not have been a more direct and honest answer?

Mr. Gaétan Caron: The direct question I was giving you, sir—with the chair's requirement that I be brief—was the most direct I could find. It was about if it is possible to have a same-season relief well. As you know, it is our policy. So those wells that will be proposed to us must meet our policy.

Mr. Nathan Cullen: So here's the crux then—

Mr. Gaétan Caron: It has been proposed by the B.C. investment management corporation. They wrote to us as part of a review. They said they encourage the NEB to require companies to drill similar—

Mr. David Anderson: Point of order, Chair.

The Chair: Point of order, Mr. Anderson.

Mr. David Anderson: Mr. Cullen got an answer to this earlier. He's trying to make an issue of this both in the media and in Parliament.

Mr. Nathan Cullen: That's not a point of order—

Mr. David Anderson: He got a clear answer earlier on this. I think he needs to go on to another point here rather than badgering the witness on the same issue.

The Chair: He did.

Go ahead, Mr. Cullen.

Or finish the answer if you would, Mr. Caron.

Mr. Gaétan Caron: I was about to answer the question, Mr. Chair, if I may.

The answer to your question is yes, if in fact you drill two wells at the same time. Mr. Ruelokke has said that the Senate committee report in August says we're not so sure it's a good idea.

So the only honest answer I can give you, Mr. Cullen, is that given all the uncertainties as to the depth of wells, the depth below the ocean floor, the ice conditions, whether you have permanent ice, whether you're near shore, it's a plethora of possibilities.

● (1245)

Mr. Nathan Cullen: Let's clear the air.

Mr. Gaétan Caron: At the end of the review, I commit to you that we'll have very clear answers as to what companies will have to do to meet the policy requirements of the National Energy Board.

Mr. Nathan Cullen: That's clear right now. With the wells—

The Chair: Mr. Cullen, your time is up.

Mr. Nathan Cullen: Chair, I was interrupted, and you've given me exactly three minutes where you've given other committee members four, so I'll ask this last question.

The Chair: Okay, you have 30 seconds left right now, question and answer.

Mr. Nathan Cullen: With the wells that you have planned right now, can they do same-season relief wells, which are required under the act right now? Can they do this?

Mr. Gaétan Caron: I will have to repeat my answer, Mr. Cullen. If they drill two wells at the same time, without the question marks I have about that, the answer is maybe. We do not know. We're asking precisely that question, Mr. Cullen, in our Arctic review.

Question 16.1 in the preamble cites our requirement or policy. The question is how you are going to do that. If we knew the answer to that question, we would have answered it.

Mr. Nathan Cullen: Do you have the answer?

The Chair: Thank you very much for your answer.

Thank you, Mr. Cullen, for your questions.

Thank you all once again for coming. I thought it was an extremely informative meeting with information that is I think really important for Canadians to hear. So thank you all.

I will suspend for about two to three minutes while we go in camera. Then we'll come back and deal with the isotope report.

[*Proceedings continue in camera*]

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