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Chair

Mr. James Maloney

Standing Committee on Natural Resources

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● (0850)

[*English*]

The Chair (Mr. James Maloney (Etobicoke—Lakeshore, Lib.)): I call the meeting to order.

Good morning, everybody. Welcome. I'm glad to be back at it today.

We're pleased to be joined today by two organizations and three individuals. From Ontario Power Generation, we have Mr. Glenn Jager, president and chief nuclear officer. Thank you for coming, sir.

From the Office of the Auditor General, we have John Affleck and Julie Gelfand. Thank you both for attending today.

What we will do is turn the microphone over to each group for a presentation of up to 10 minutes. You can speak in either official language. There are earpieces, which I encourage you to use for translation services. You will be asked some questions in French, and of course you're welcome to deliver your remarks or answer questions in French as well.

Perhaps, Mr. Jager, I'll start off with you, if that's all right.

Mr. Glenn Jager (President and Chief Nuclear Officer, Ontario Power Generation Inc.): Yes, it is.

Thank you, Mr. Chairman and committee members, for inviting me to speak with you today. It's an honour.

I'd like to talk about our nuclear industry, its future, and the role of Ontario Power Generation in that. It's an important sector, and it contributes to the sustainability and well-being not only of Ontarians but of all of Canada.

My name is Glenn Jager. I'm the president of Ontario Power Generation's nuclear fleet, and its chief nuclear officer. I'd like to start my remarks with a little-known story about an American admiral and his prediction.

Admiral Hyman Rickover was known as the father of the nuclear navy. He served there for 30 years. He really set in place a lot of the standards and principles that we use to this very day in the nuclear industry.

In 1957 he delivered a speech entitled “Energy Resources and Our Future”, in which he talked about energy and how its effective application drives civilization.

He observed that in 1850, 95% of the energy consumed came directly from humans and animals, pulling carts and things. Only 5% came from fossil fuels. A century later he noticed that was completely reversed, with most of the energy coming from fossil fuels. It was an incredible turnaround in just 100 years.

He then questioned what the next 100 years would look like, from 1950 to 2050, and hypothesized that the future would be increasingly more energy intensive, driving the economy and the quality of life.

Renewables and nuclear would become energy superstars, he said, and historians would someday refer to this as the “fossil fuel age”, the golden age of fossil fuels. He predicted this in 1957.

Think about that and about what's happening now. If we achieve Canada's carbon reduction goal in 2050, that will end the use of fossil fuels. At a minimum, it will substantially reduce it and change its role significantly in our economy.

Nuclear power has played a big role in that. It's helped Ontario move off coal. In 2014 we burned our last piece of coal to make power. Today more than half of Ontario's power comes from its three nuclear stations, and nuclear energy generates about 15% of the country's electricity.

This isn't a well-known fact, as Dr. John Barrett, president of the Canadian Nuclear Association, pointed out last week to you, and he's right. He is correct in saying, too, that nuclear energy is a stable source, and it's not dependent on fossil fuels.

This is an important piece of the nuclear story. Its power is 99.7% greenhouse gas-free.

To echo Dr. Barrett, in 2015 OPG stopped using coal to create electricity. This was the largest single climate change initiative in North America. It brought about the disappearance of the smog days in southern Ontario and the greater Toronto area.

OPG manages, and firmly believes in, a balanced energy portfolio that includes wind, hydro, gas, and nuclear, but it has to be said that it was the bringing back on line of the four reactors at the Bruce station and the two at Pickering that allowed us to stop burning coal and still maintain a clean energy system.

Nuclear is clearly a superior source of energy, especially at a time when Canada and so many other countries around the world are searching for ways to limit their greenhouse gas emissions. It's a clean source of energy, and it's also a cheaper option. OPG's power is low cost. It's about 40% lower than that of other generators in Ontario. It's a made-in-Canada technology, with a deep and diverse supply chain that's anchored right across the country.

Radioisotopes produced by our reactors have many applications in agriculture, medicine, industry, and research. Their applications vary from insect control to food preservation, and from detecting groundwater resources to the diagnosis and therapy of medical conditions worldwide.

Nuclear is helping to drive our economy and the well-being of people around the world.

● (0855)

Today OPG is a much different company from when it was first established in the late 1990s. We're smaller, we're more efficient, and we're more outwardly focused. We have converted two of our coal stations in northwestern Ontario to renewable biomass. The move saved jobs and contributed to reinvigorating local economic development.

We rely more on partnerships and strong community relationships to help us deliver our mandate. As a result, we have made strong commitments to mutually beneficial working relationships with indigenous communities near our current and future operations. For example, we have put in place a formal framework to assess and resolve historical past grievances. OPG has reached 23 past grievance settlements with 21 first nations communities, closing out all of our historic grievances. In turn, these efforts have resulted in a series of generation development partnerships.

Let me tell you about some of these. The Lower Mattagami River project is a $2.6-billion hydroelectric redevelopment partnership with the Moose Cree First Nation. It was completed last year on time and ahead of schedule, and on budget. Nearly 2,000 people were employed during peak construction, including 250 local indigenous people. As well, just last year, in partnership with Coral Rapids Power, a wholly owned company of Taykwa Tagamou Nation, OPG started building the Peter Sutherland Sr. generating station on the New Post Creek in northeastern Ontario. It is a $300-million project and is expected to employ 220 workers at its peak. It is scheduled to begin operating in 2018.

It's important to note, too, that with the help of these local partners and support from the public, OPG has been able to deliver all of these projects on time and on budget.

This is a good segue to the Darlington project that's happening right now. Last month, OPG began work on the first of four units at the Darlington station to undergo a full refurbishment. It's a 10-year, $12.8-billon megaproject that will ensure safe, clean, reliable, and cheap power in Ontario for the next 30 years. It is the largest clean power project in Canada, and an investment in our future.

Again, OPG has made a solemn promise to Ontarians that this project will be delivered on time and on budget. Darlington supplies 20% of all of Ontario's power. It is the lowest-cost provider in Ontario, and one of the best-performing nuclear plants in the world. It does all of this without polluting the atmosphere. To put it into even greater perspective, operating Darlington until 2055 is the equivalent of removing two million cars from Ontario's roads per year.

There are also tremendous economic spinoffs from this mega-project for Ontarians, businesses, and government. It is expected Ontarians will see $14.9 billion in economic benefits. An average of 8,800 jobs will be created annually. There will be an $8.5 billion increase to household revenues, and about $5.4 billion in revenues for all three levels of government.

The Conference Board of Canada estimated the refurbishment and continual operation of Darlington to 2055 will boost the province's GDP by $89.9 billion. This is all for an investment of $12.8 billion, so it's very good news.

What do we see for the nuclear industry beyond Darlington? We see a lot of exciting possibilities. The completion of the refurbishment, which will be delivered on time and on budget, will provide the public with the confidence for OPG to pursue new nuclear options. Among the options and on the horizon are what the industry calls SMRs, or small modular reactors. Right now there are different technologies, manufacturers, and researchers, and they're still developing ways of commercializing these small reactors.

These small reactors could have the potential to provide heat and electricity to remote communities with an industrial operation, such as a mine. They could also be used on an already existing site, connected to the grid, providing clean and stable energy for urban households.

It would mean the end of the huge nuclear plants and the massive upfront cost to construct them. It's more of a graded approach. Much work still has to be done on SMRs, but OPG is well positioned to support the development and introduction of this technology.

● (0900)

Darlington not only has a site licensed that could use these small reactors; it also has the supply chain, the skilled personnel and support, and could serve as the testing ground for all Canadians to explore this future nuclear technology.

In closing, let me say that there is tremendous potential for nuclear energy. Safe, clean, reliable energy is what drives our economy and ultimately the kind of life that we, as Canadians, enjoy.

Building on that thought, I want to reinforce one of the themes of my presentation. OPG is not just a power company; it plays a positive role in the lives of residents right across the province. OPG's aim is not only to deliver low-cost, clean, and reliable power safely; its aim is to generate power with a purpose, one that will make a difference in the communities where it operates, now and for the future.

Thank you.

The Chair: Thank you very much.

Ms. Gelfand, you look like you're ready to—

Ms. Julie Gelfand (Commissioner of the Environment and Sustainable Development, Office of the Auditor General of Canada): I'm ready to go.

The Chair: —to start. Okay. We'll turn the mike over to you.

Ms. Julie Gelfand: My name is Julie Gelfand. I'm the Commissioner of the Environment and Sustainable Development. My office is located in the Office of the Auditor General.

[*Translation*]

Mr. Chair, thank you for this opportunity to participate in the discussions as part of your study of the nuclear sector. This panel is timely in light of my recent audit report on the inspection of nuclear power plants, which was tabled in Parliament as part of my 2016 fall reports. Joining me at the table is John Affleck, the principal responsible for the audit.

My role as commissioner of the environment and sustainable development includes conducting performance audits to independently assess how well the federal government is fulfilling its commitments to protect the environment and to foster sustainable development.

Within my seven-year mandate, one thing that I have been doing, which may be of interest to your committee, is a series of audits relating to Canada's natural resource sectors. In addition to my audit of the inspection of nuclear power plants, which I will talk about today, I completed an audit last year on the regulation of oil and gas pipelines. I also intend to examine in the future more resource sectors, which may include mining and aquaculture.

[*English*]

Mr. Geng Tan (Don Valley North, Lib.): There's a problem with the translation.

A voice: Is it not working?

The Chair: Go ahead, please.

[*Translation*]

Ms. Julie Gelfand: As you know, nuclear power generation in Canada, produced through the country's four operating nuclear power plants, is an important source of electricity for Canadians. However, unfortunate events such as Chernobyl and Fukushima are constant reminders that this industry is not without risks and needs to be well managed.

This is why I undertook an audit of the Canadian Nuclear Safety Commission. The commission regulates the use of nuclear energy and materials under the 1997 Nuclear Safety and Control Act. The commission does this so that the environment and the health, safety, and security of Canadians are protected, and Canada's international commitments on the peaceful use of nuclear energy are implemented.

Verifying that the industry is complying with all laws, regulations, and conditions is a core part of what regulators have to do. My audit focused on site inspections, which are one of the key verification tools used by the commission to assure Canadians that nuclear power plants perform safely and comply with regulatory requirements and licence conditions.

At this juncture, I think it is worth mentioning that this was an audit of the commission, and not of the operators of nuclear power plants, such as OPG, who are responsible for their safe operation. My audit pertained to the commission and what it is required to do to inspect facilities, and not on the operators of nuclear power plants as such.

Also, the audit did not cover inspections of nuclear waste facilities.

● (0905)

[*English*]

In our audit, we found that the commission conducted 226 site inspections of nuclear power plants that it had planned over the two-year period that we looked at. We examined a sample of 42 site inspections, the majority of which reported compliance issues, so we looked at how they did their inspections. We found they did 226 of them. We then looked very closely at 42 site inspections and found that the majority of them had non-compliances, so when the inspections were done, non-compliances were found. However, we found that the commission followed up with the licensees, the operators, 100% of the time. Every time there was a non-compliance, the commission was on it. The commission therefore ensured that all the issues were being addressed, so that was a tick on the good side for the commission.

However, we found that it was unclear whether the Canadian Nuclear Safety Commission was conducting the appropriate number and type of inspections, because its planning process was not very well documented. The commission could not show that planning was rigorous, systematic, and risk-based to verify that nuclear facilities were complying with all regulations.

Let me give you an example. The commission had a five-year plan intended to set out the minimum number of inspections required to verify compliance, but this plan changed into more of a list of all possible inspections. The list that was supposed to be the minimum number of inspections morphed into becoming a list of all the possible inspections we could do. That is not particularly systematic or rigorous. Particularly when we're talking about the nuclear industry, which has issues around safety, we need to make sure it's operating safely. From our perspective, the commission should have a five-year plan. The minimum number must be done in these five years, and it shouldn't just become a wish list of inspections.

We also found that the commission carried out only 48% of the inspections set out in that plan. Because of that, the commission also could not show that it had allocated the appropriate number of staff to carry out inspections. When we went to the nuclear stations and we spoke to the inspectors on site, at every single site we went to, the inspectors indicated to us that there were not enough inspectors on site, from their perspective.

Furthermore, we found that three-quarters of site inspections were conducted without an approved inspection guide. The commission's rules are that when an inspector goes out to do an inspection, that inspector must have an approved inspection guide, and we found that 75% of those site inspections were conducted without an approved inspection guide. An inspection guide is essentially a checklist that an inspector uses during the inspection, and it is intended to set out what needs to be checked, basically, to make sure that the inspectors cover everything. We did not find those approved guides in three-quarters of the site inspections that were completed.

We also found that the commission did not provide clear guidance to inspectors on which documents to retain, so as they're doing their inspections they've got notes, checklists, a handbook—field notes, basically as they're walking through and doing their inspection. Because this information was not retained in some cases, the commission could not show that its inspectors had looked at everything that was supposed to be verified. It could not assure us, therefore, that the inspection reports fully and accurately reflected the observations made during inspections.

Last, we found that the commission had a standard time for issuing inspection reports of 50 business days after on-site inspection activities. The commission's target was to meet the standard 80% of the time, but it did so only 64% of the time. This is important, because licensees like OPG have a certain number of days to respond to the commission with an action plan addressing the compliance issues, but this time period only starts once the operator receives the final inspection report. If much of the time it's not receiving it on time, it takes longer to fix the non-compliance issue.

Overall, our audit concluded that the commission could not show that it adequately managed its site inspections of nuclear power plants. We did make a number of recommendations to the commission, including to implement a well-documented, systematic, and risk-based planning process, a five-year plan with a minimum number of inspections—not a potential list of inspections—that followed their own procedures, meaning with approved inspection guides for every inspection.

The commission agreed with our recommendations, and its responses are published in our audit report. I also understand and have seen that the commission has posted an action plan on its website, indicating that it has already started to address our recommendations. However, we have not audited those actions.

● (0910)

[*Translation*]

Mr. Chair, this concludes my opening statement.

We look forward to answering the committee's questions.

Thank you.

[*English*]

Thank you very much.

The Chair: Thank you very much.

Mr. Lemieux, you're first on the question paper.

[*Translation*]

Mr. Denis Lemieux (Chicoutimi—Le Fjord, Lib.): Thank you, Mr. Chair.

Welcome back. We nearly had time to miss you even though you were only away for one meeting. I can tell you though that Mr. Barlow did a very good job replacing you. I would also like to thank the witnesses for being here with us today.

My first question is for the spokesperson for the office of the Auditor General of Canada.

Given my expertise in engineering and my experience as a professional helicopter pilot, I have always worked in environments where quality control and strict compliance with procedures were essential. In short, I have always been in an environment in which there was an obligation of results, but not an obligation of means. It is clear to me that the people in the nuclear safety sector in Canada have this same obligation of results, that is, to ensure the absolute safety of Canadians.

Representatives of the Canadian Nuclear Safety Commission have appeared before our committee. They told us that Canada's nuclear sector is one of the safest in the world. Canada is very highly regarded in the international nuclear community.

Finally, I reviewed the report from your office entitled “Report 1—Inspection of Nuclear Power Plants—Canadian Nuclear Safety Commission”. I note that, since 2000, the commission has been conducting inspections without an approved guide. You stated that there are fewer inspections and that they do not comply with systematic and well-documented inspection procedures.

Can you elaborate on how the Canadian Nuclear Safety Commission responded to your recommendations?

Ms. Julie Gelfand: I have been the environment and sustainable development commissioner for two and a half years. After I finish my reply, I will give the floor to Mr. John Affleck since he has worked with these organizations much more than I have.

No one likes to be audited by the auditor general or the commissioner. Departments do not like us coming onto to their premises to see if they have done what the are supposed to do. There are, however, a number of ways of reacting to an audit by the auditor general or the commissioner. For example, officials can think that, since they are managing a large organization, they cannot be aware of everything that happens in it. Or a deputy minister of an important department can be grateful that the auditor general or commissioner has audited a small part of the department's operations and made recommendations. The deputy minister can also show openness and look at the audit as a way of learning something.

From what I have heard, this is not what happened with the Canadian Nuclear Safety Commission. According to Mr. Affleck, it was quite difficult to work with this organization. I would say that the commission was aggressive with the auditors.

My last report covers three audits. To guide you on these matters, I would invite you to look at the Fisheries and Oceans Canada audit. You will see how the department responded to our recommendations. You can compare the response of Fisheries and Oceans Canada to that of the Canadian Nuclear Safety Commission.

Fisheries and Oceans Canada showed openness. If an organization is audited by the auditor general, I would say the best reaction is to agree and say they will do everything they are told because these audits are important and serious.

If you look at the Canadian Nuclear Safety Commission's response, you will see there is a kind of code. It says it agrees with our findings, but that it will continue on as before and that it is doing everything correctly.

Since French is my second language, I hope I have been clear. I think your question is very important.

I will now give the floor to Mr. Affleck.

● (0915)

[*English*]

John, can you add to that?

Mr. John Affleck (Principal, Office of the Auditor General of Canada): Sure. As Julie mentioned, I have a fair bit of experience—

[*Translation*]

Ms. Julie Gelfand: You have nearly 30 years of experience.

[*English*]

Mr. John Affleck: —doing performance audits, and this was a challenging one, to say the least, but in the end I'd have to say it was positive in the sense that we came to “yes” and we did get the commission to agree to all our recommendations. Mind you, if you look at the responses, the first paragraph is in total agreement, then the second paragraph goes on to extol all the good things that the commission is doing.

Probably the most challenging thing for the team is the commission is full of really experienced, really good people, and over time it has developed a corporate culture of relying on professional judgment. You'll note several observations in our report to that effect, and in a precision industry, as you suggested, Mr. Lemieux, we'd expect things to be very rigorous, very systematic, very documented, very precise. That led to a healthy debate about the value of doing that, but we would expect no more from the regulator than we would from the industry.

[*Translation*]

Mr. Denis Lemieux: For your part, Mr. Jager, what do you think of the commission's work?

[*English*]

Mr. Glenn Jager: Let me start with this. There are two principles, and principle number one—I agree with Ms. Gelfand—is that safety for the operators is our first priority always, and our plants are safe. It's built into our operation first and foremost. We understand very clearly that is our accountability to all Canadians. It's in our procedures. It's in our training. It's in our operations, just as you mentioned for pilots. It's in our DNA, quite frankly, and everybody in OPG understands that, and that's how we operate. That's a basic first principle.

The second principle, I would say, is that critical review is very important to the nuclear industry in that it improves operations and ensures safety. As operators, certainly at Ontario Power Generation we view ourselves as an open and transparent organization. Everything we do is there for anybody to see. I'd invite anybody here to come to see our operation. We regularly receive audits and reviews from many different groups, including the CNSC. The International Atomic Energy Agency, an international regulator, comes to look at our operations. We have the World Association of Nuclear Operators, the Institute on Nuclear Power Operations, and all the provincial ministries that govern our operation. There are many regulators that come to look at our operation, including our own internal audit structure as well.

All this critical input is very important and very essential to safe operation. That's a fundamental principle for nuclear power operations, and good regulation really means good operation, so we value the role of the regulator. We understand the regulator's mission and we respond to any input that the regulator has for us. Certainly, and very obviously, we comply with all the conditions and licence terms that are provided to us.

The CNSC has the ultimate authority with regard to our operation. Notwithstanding the fact that we operate safely, and that is our primary objective, the CNSC has that authority. They can issue orders, audits, oversight, and we value that.

The last thing I would say about the CNSC is they have site inspectors who are there all the time, continually reviewing our operation, so, yes, they perform audits. These are structured reviews of their program and licence conditions, but in addition to that, they have site inspectors and directors who are there all the time looking at our operation, ensuring compliance, and giving us feedback where they find issues. We promptly and immediately follow up on all that feedback where we find it. We see that as a critical part of safety.

● (0920)

The Chair: Thank you.

Mr. Strahl, we'll go over to you.

[*Translation*]

Mr. Mark Strahl (Chilliwack—Hope, CPC): Thank you Mr. Chair.

Ms. Gelfand, thank you for your presentation. It was very interesting. Unfortunately, I will have to continue in English.

[*English*]

In your news conference on Parliament Hill regarding your report, you called your findings “serious” and “not acceptable” and said they should not happen when we're dealing with nuclear power plants.

I found your response to Mr. Lemieux very enlightening when we contrast it with the testimony that we had from Dr. Binder of the CNSC here before the committee. I would characterize it as downplaying the situation as administrative oversight with no impact on safety.

I have a press release here from OPG about Darlington being rated among the world's safest and best-performing nuclear stations in the world. You mentioned in your presentation that the things that come to mind when Canadians think about nuclear power are often the tragic accidents that have happened in Chernobyl and Fukushima, so we want to make sure that we are putting this in perspective but also that we are treating it seriously.

Can you speak to the relative safety of Canadian nuclear power compared to the safety of plants elsewhere in the world? Could you also perhaps expand on whether this was strictly administrative, or could it lead to problems in the future? I want to make sure that we characterize this correctly.

Ms. Julie Gelfand: I'll answer first that this was not an audit of the safety of the plants. This was an audit of whether or not the Canadian Nuclear Safety Commission followed its own rules. It's very clear.

It's clear to us as well that it's likely the industry is ahead of the regulator. I tend to agree with Mr. Jager that within the industry, safety is in their DNA. I spent a few years in the mining industry. It is in their DNA. It never used to be in the mining industry. It is now in their DNA.

The industry is making sure that it's safe, but the regulator has a role to play. We looked at the role of the regulator. I also want to make it really clear that we looked at one tool the regulator uses. The Canadian Nuclear Safety Commission is looking at its logbooks every day and has meetings with them every day and is using all these other tools, but it says in its own documents that the site inspections are the primary tool. They have a bunch of other tools, but the site inspections are the primary tool they use, so we looked at the primary tool. Unfortunately, we couldn't look at everything.

It's not just administrative. We saw more than one five-year plan for minimum site inspections, so which one is it? In an industry that requires precision, that probably lives with precision, to have a regulator that is not as precise, as rigorous, as systematic as the industry, is the part that's not acceptable from my perspective. They have to be as rigorous as the industry, if not more so, and to come and show me three rolls of five-year plans.... Which one is it? As an average Canadian, I don't think it's right from the regulator's perspective to have a five-year plan of the minimum number of site inspections morph into something that's not really the minimum but kind of the whole list of possibilities.

I'm going to try to answer the question. I can't tell you the safety of our plants. That's in the hands of the operators. We looked at one tool that the CNSC uses, the primary tool. We found some gaps. Are they purely administrative? I would say no, but they're still doing the site inspections. They're following up 100% of the time when they have a non-compliance. They're not doing them with approved guides, so it's like a pilot who has a checklist not having the checklist. Most pilots have a checklist. The operators are the pilots in a sense, but the inspector is also kind of a pilot for his site inspection and should have a checklist to cover everything. I want to know that the inspector is perfect, if you know what I mean. I want the industry to be perfect. It's in their DNA, but you would expect the regulator to be just as precise, just as risk-based, just as systematic.

● (0925)

Mr. Mark Strahl: Right, and I think, having been around this for a while, that you're right. Usually when a press release comes out from a government department that finds itself under the microscope, they will accept every recommendation of the Office of the Auditor General and move quickly to implement. Certainly that wasn't the first response of the regulator when they were here.

In your opinion, have they moved quickly enough to address the shortcomings that your audit revealed?

Ms. Julie Gelfand: We found on their website that they have an action plan. I was reviewing it prior to coming here. They indicate they have completed, I think, four out of the five recommendations. They still have one. They have given themselves a deadline.

I can't give you any assurance. I'm an auditor, a verifier. I can't say, “Yes, it's done.” They say it's done. I haven't gone in to check that it's done.

Mr. Mark Strahl: Do you do that?

Ms. Julie Gelfand: No. That's actually your job.

Mr. Mark Strahl: Okay. Thank you for the task.

Ms. Julie Gelfand: My job is to present to Parliament the findings, and your job is to hold the entity accountable.

I'll go in perhaps and do a follow-up audit, but the list of potential audits I can do, the list of potential industries that might be of interest to you that you think maybe we should be looking at from a sustainable development perspective, is so big that in my seven years I don't think I'll go back into the nuclear industry on this one.

The way this whole thing works is the auditor provides the information to parliamentarians, and parliamentarians hold the entity accountable.

Mr. Mark Strahl: Thank you.

Ms. Julie Gelfand: I'm sorry for being so blunt.

Mr. Mark Strahl: I appreciate it.

The Chair: Mr. Cannings is next.

Mr. Richard Cannings (South Okanagan—West Kootenay, NDP): Thank you, and thank you all for being here today.

Monsieur Lemieux and Mr. Strahl have covered a lot of what I wanted to ask as well. Perhaps I'll go into a bit more detail.

Mr. Strahl mentioned the testimony of Dr. Binder at this committee last week, when he said the draft guides were an administrative oversight. I took from his testimony that the draft guides were real guides, but they forgot to say they were, or make that decision, and that it had no impact on safety.

Do you agree with that assessment? Can you comment on whether they had any impact on safety, or is the point you can't tell?

Ms. Julie Gelfand: I'm going to pass that to John. He was the lead auditor and saw this stuff.

Mr. John Affleck: We saw a range from approved guides to no approved guides to draft guides to no guides. I would say the most troublesome part was when inspectors went out with no guide and just used professional judgment. We view that as a concern in terms of continuity as well. When you have turnover, you have to have the information written down so the next person who comes along can follow the same procedures.

In terms of a good example for administrative activities, we looked at their master inspection database and we found a lot of errors with that data's integrity, including inspections that were marked as completed that were never completed, and ones that were completed that were never marked as such.

If you're using that to make assessments and you have an indication that an inspection was actually done and it wasn't, that could be a bit more than administrative, should there be an unfortunate incident.

● (0930)

Mr. Richard Cannings: Right.

On another bit of detail, in the report you said we were told by site inspectors and site supervisors at every nuclear power plant that there were either not enough inspectors at their sites or not enough at the levels needed.

Can you clarify how short, on average, these sites were in terms of inspectors. What's the impact of this short-staffing?

Mr. John Affleck: It was hard for us to draw a judgment on that, because we're not the experts. As my colleague here has said, the CNSC does have people on site in addition to the 24 inspectors it assigns to the plants, but as the commissioner has alluded to, if you don't have a minimum number of inspections identified, then you don't know the minimum number of people you need to carry out those inspections.

While headquarters was telling us.... It's not unusual in an audit. You have central in Ottawa, and you have the regions of a department. The regions will tell you we don't have enough people, and this and that. We often don't give too much credence to that, but at every single site we went to, we were told that the people on site didn't feel they had enough people or people at the right level. We felt it was significant enough to report. We reported it not so much as our observation but to convey what the inspectors had relayed to us.

Mr. Richard Cannings: I think I'll finish with a general question to both of you and ask what advice you would have to offer CNSC so they can regain the confidence of Canadians, because this was a fairly damning report, I think.

Ms. Julie Gelfand: I think our best advice is highlighted in the recommendations. John mentioned the concept of professional judgment. The culture of relying on professional judgment is.... Obviously we do have to rely on professional judgment. At the same time, we also have to have things clear so that it can transfer from one generation to the next, from one inspector to the next. You need both. You need it to be well planned and systematic, with all the risks identified.

My guess is that the industry does that. The regulator should be doing it as well. Our best advice is to look at our audit that we did this year, and also our previous audits, and make sure that they are ahead of the industry, as opposed to....

To me, making a mistake in your database saying a site inspection was completed when it wasn't completed.... What if that thing, that piece or unit or something, blew or didn't work, and it created a real problem, but it was marked in their database as inspected? This means that maybe it doesn't get inspected again for two years or three years, and maybe then it's six years between the times it gets inspected. Those kinds of mistakes should not be happening with the regulator of an important precision industry. It provides 15% of our electricity, and over 60% in Ontario. It's important, and it had better be precise.

The Chair: You have a bit more time if you want.

Mr. Richard Cannings: I'll turn to Mr. Jager, then.

According to a Canadian Press report in February, 200 communities and environmental groups have argued that nuclear waste facilities would be too risky, given their proximity to Lake Huron. Among the municipalities that were concerned were Thunder Bay, Sault Ste. Marie, Kingston, Cobourg, Ajax, Hamilton, Toronto, Niagara Falls, Detroit, Flint, Toledo, etc. They're all concerned about the effects such a facility would have on this very important watershed. I just wanted to know what reply you have to those concerns.

● (0935)

Mr. Glenn Jager: We'll probably get into that in more detail in the next session, but what I would say is we've been safely managing waste for more than 40 years, and the storage and transportation of waste.

In reference to the DGR that we're proposing to construct at Bruce County, this was reviewed over a 16-year period. It's a science-based, very rigorous evaluation, and was internationally reviewed as well. The conclusions of all those independent assessments were that this management plan and this facility would be safe—very safe, in fact—in management of the waste.

When we look at the opinions of all of Ontarians in all the communities, over 70% indicated that they were in favour of the waste plan that we put together, and specifically the DGR and how we propose to manage waste.

The Chair: Thank you.

Mr. Tan, it's over to you.

Mr. Geng Tan: Thanks, Chair.

My question is for OPG.

One year ago, many GTA residents in the Durham region and Scarborough received a package of iodine pills in the mail. Those pills were meant to protect the residents who live within 10 kilometres of Pickering and Darlington. Our CANDU technologies have proven to be technologies of high performance and with inherent safety features. As I know, OPG has very robust emergency preparedness program and a five-layer defence-in-depth principle. Even though a serious nuclear accident is extremely unlikely from OPG or in Ontario, some residents still felt increased fear when they received these pills in the mail, because they didn't know what they were.

My guess is that when the OPG goes to the residents and tries to explain the situation and the principle, they may not trust you 100%, because you're the nuclear energy producer. In your opinion, what is the best way to educate the local people? Should the government be more active in promoting this greater public awareness or confidence in our nuclear safety?

Mr. Glenn Jager: Specifically in regard to KI pill distribution, this is an example of the regulator saying, “These are the requirements that you must meet.” The province is accountable for the emergency preparedness of any event in the province, including nuclear events, through their emergency preparedness.

OPG's role in that is to ensure that we provide the materials to assist the province in developing those plans and educating the population that's in the vicinity of the plant or who would be affected by those plans. We provided a very interesting package—I can send you one—on the KI pills and how they are intended to be used. That went with every package. As well, we've done a number of studies in terms of the communities and everybody that's within that area. The support is extremely high. In fact, when we've done these studies, we've found that the support for nuclear power and our operation is among the highest in the world.

We feel our programs are effective. They are reaching.... There are some individuals who may never like it, but we'll keep trying. We'll keep trying to educate and we'll keep trying to develop materials. We accept any feedback. We're actively looking for feedback on how to improve, constantly.

Mr. Geng Tan: I have another question about nuclear safety.

The Darlington Nuclear Generating Station has been producing about 20% of our electricity for Ontario. Starting this year, for the next 17 years, Darlington will be undergoing a major refurbishment project that will allow Darlington to operate safely until 2055. At the same time, the Pickering station will be shut down around 2020.

What strategies are you putting in place to make sure that the refurbishment project and the shutdown of the Pickering station will not affect Ontario's energy needs over the next, let's say, 17 years?

● (0940)

Mr. Glenn Jager: The energy requirements for the province are managed by the IESO. We're a generator, so we provide energy to the province.

The refurbishment of Darlington will take 10 years. That's the time span. We're seeking to operate Pickering right through that period. The completion of the refurbishment coincides pretty much with when Pickering will cease commercial operations. The real question will be how the energy that Pickering currently produces is going to be provided to the province. The IESO will look at the existing capacity, first and foremost, within the province, and that will likely come from the existing gas generation within the province, as well as some renewable projects and existing renewable energy. That's the current plan.

Mrs. Alexandra Mendès (Brossard—Saint-Lambert, Lib.): Thank you, Mr. Chair.

[*Translation*]

Ms. Gelfand, I will give you some background.

I am a member of the Standing Committee on Public Accounts and we hope to invite you to appear before us. At that time, we will be able to follow up on the recommendations you made to the Canadian Nuclear Safety Commission and that we would like to see implemented.

Do you have a specific recommendation to make? The Standing Committee on Public Accounts usually asks for an action plan with timelines. You have already alerted me that the commission's processes are not necessarily the most reliable. Do you have any recommendations to help direct our approach with the commission, to ensure that all your recommendations are implemented and that we do not have the same kind of report in five years?

[*English*]

The Chair: I'm going to have to ask you to answer that in less than a minute.

Ms. Julie Gelfand: Okay.

[*Translation*]

Can I think about it? I have not yet appeared before the Standing Committee on Public Accounts. I would like to talk to the auditor general and ask his opinion. That would be my first appearance before that committee. I would be very pleased to have the opportunity because the audits I conduct are similar to those of the auditor general.

Mrs. Alexandra Mendès: We are fully aware of that aspect of your work.

Thank you.

Ms. Julie Gelfand: I will get back to you with an answer on that.

Mrs. Alexandra Mendès: Thank you very much.

[*English*]

Ms. Julie Gelfand: You have a minute.

The Chair: Mr. Sweet, I can give you three minutes.

Mr. David Sweet (Flamborough—Glanbrook, CPC): Thank you very much, Chair.

I'll start with a little bit of a statement, then I have one question to Mr. Jager.

I would think that it would have to be profoundly frustrating for Mr. Jager and other people who are suppliers of nuclear energy that the regulator is seen in this light in this report.

I think that in the general public, if there are two points of frustration or lack of trust, one of which my colleague from the NDP has already pointed out, they would be around the management of waste and the safety of the plants themselves.

When the commission does not have a standard that's excellent, it fuels that lack of trust. Unfortunately, your report will be used by people who are anti-nuclear. It will be used, I'm certain, in a way that is out of proportion to how it was intended. It will make it tougher on power producers who operate nuclear plants, as OPG does.

I find that very frustrating. I hope that their compliance is immediate and that they are able to show that and demonstrate it to the public so that any unneeded scrutiny is mitigated.

You mentioned a number of things, Mr. Jager, in your testimony. I wish I had 30 minutes, because some of them I would really like to ask you about in regard to the billions of dollars that some of these plants will generate in GDP.

The day before yesterday in *The Kingston Whig-Standard* there was a big story. A woman had to choose between rent and paying her electricity bill. I need to ask you this question, because every constituent that I represent would say, "Hey, you know what? One of the biggest concerns I have right now is my electricity bill," and you just testified that it was low cost. I'll just give you an opportunity to explain that.

How do you represent a low-cost electricity provider when one of the biggest frustrations for Ontarians today is their electricity bill?

● (0945)

Mr. Glenn Jager: I would say that the electricity bill is made up of many contributors and many components. From the OPG standpoint, our cost is 40% below the average cost. You can draw a conclusion on the effect of our cost on the total price. It brings the price down.

One other thing—

Mr. David Sweet: That 40% less is less than who?

Mr. Glenn Jager: Than all the other operators.

Mr. David Sweet: In Ontario?

Mr. Glenn Jager: Yes, in Ontario. We're 40% less than—

Mr. David Sweet: What about other jurisdictions?

Mr. Glenn Jager: I can't comment on the other.... We could probably get that information, but I don't have it for you.

Mr. David Sweet: Would you table that with the committee at a later date?

Mr. Glenn Jager: We can certainly provide that, but we're 40% less than the average in Ontario.

One other thing I would leave you with—

The Chair: Very quickly, Mr. Jager.

Mr. Glenn Jager: —is that all the taxes that we pay and the revenue that OPG makes goes directly back into the Province of Ontario to use as it sees fit, so it's actually better than that.

The Chair: Thank you very much.

I'm going to have to stop it there. The good news is that we may have another chance to discuss this very shortly.

To our witnesses, thank you very much for joining us this morning. Your evidence is going to prove very helpful for what we're trying to accomplish here. We appreciate your taking the time to be here.

We're going to suspend for two minutes, and I mean two minutes, because we have three groups in the next hour, one of whom looks very familiar.

Thanks.

● (0945)

(Pause)

● (0950)

The Chair: Welcome back. We're going to get going for the second segment of our meeting this morning. Thank you, everybody.

We have three groups of witnesses for this session. From Bruce Power, we have James Scongack. From the Nuclear Waste Management Organization, we have Laurie Swami, Derek Wilson, and Elena Mantagaris. Back by popular demand, from Ontario Power Generation, we have Mr. Jager.

Thank you all for joining us.

I will open the floor to Bruce Power.

Mr. James Scongack (Vice-President, Corporate Affairs, Bruce Power): Thanks very much for having us here today. My name is James Scongack, and I'm the vice-president of corporate affairs and environment at Bruce Power.

Before I give the Bruce Power overview and share some information with the committee, and before answering some questions and passing it off to my colleagues, I just want to thank this committee for looking into this important issue.

From a Bruce Power perspective, one of the things we've always said is that if we look at the role of energy in Canada broadly, and where we want to be as a country, it's really a three-legged stool.

The first component consists of a modern, strong, successful oil and gas sector, primarily based in western Canada, but which we see impacting the entire country.

The second component is looking at provinces like British Columbia, Manitoba, Newfoundland, with very successful long-standing hydroelectric generation and a real role on that front.

The third leg of the stool is the nuclear industry, an industry that unfortunately sometimes does not get the recognition that it deserves, frankly.

It's really important that all three of those elements be connected and successful for Canada to have a modern, clean, successful, and economically viable electricity system. My comments will be very consistent on that front today.

For those of you who aren't aware of Bruce Power, we're Canada's only private sector nuclear generator. We operate the largest nuclear facility in the world, located in southwestern Ontario. We're entirely Canadian-owned. Our ownership consists of the OMERS pension benefit plan that invests pension funds for about 400,000 to 500,000 public service employees in the Province of Ontario; TransCanada, a massive energy player in North America; and our two unions on site. Ninety per cent of our workforce is unionized, and the Power Workers' Union and the Society of Energy Professionals are also owners in our business. In addition, over 90% of Bruce Power employees are self-investors in our company. That's our ownership structure. It's unique.

The structure of our company itself is also unique. We lease our facility from the Ontario government under a long-term lease that will run until 2064. We sell all of our output under contract, through the IESO in the province of Ontario. We're the largest public-private partnership in Canada. Over our first 15 years of operation, we've invested about $10 billion into our site. We have a plan, over the course of the next 20 years, to invest nearly another $13 billion to $20 billion.

One of the previous questioners from the other session asked about the price of power. For those members who are not from Ontario, this is one of the top-of-mind issues on the electricity file right now in Ontario. We are paid for all of our output through a contract with the IESO. As Mr. Jager alluded to, like the OPG nuclear division, we're a low-cost electricity producer.

Just to put that into perspective, there are a number of components that make up your electricity bill if you're an electricity consumer in Ontario. One component of your electricity bill, anywhere from 40% to 50% of it, depending on where you live in the province, is actually the cost of electricity. As Mr. Jager alluded to, similarly to Bruce Power, if you receive 100% of your electricity from any of the nuclear facilities in Ontario, the cost of electricity on your bill would drop between 40% and 45%.

Sometimes there's a myth that the cost of nuclear electricity doesn't cover everything, when in fact it does. When we talk about the 6.5¢ that Bruce Power is paid per kilowatt, that covers every cost of our operation. It pays for the spent fuel that will eventually be in Laurie's care and control. It covers all of our long-term liabilities. It includes all of our capital. It includes everything we generate from our operation. That's a really important point. That's why we've been recognized as a unique public-private partnership in Canada.

Obviously my comments have been a bit more Ontario-centric, because that is where we operate, but I think there are a number of important, broader Canadian elements to our operation that would be of interest to the committee, the first in the area of clean air. As we saw earlier in the week, the Minister of Environment talked about moving towards a coal phase-out agenda for Canada by 2030. I know that's going to be an issue that will be actively discussed in the coming weeks.

As people are also aware, 2015 was the first year that we had no coal generation in Ontario. Ten years ago, about a quarter of our electricity in Ontario came from coal.

● (0955)

Yesterday the Asthma Society of Canada released a report marking the first anniversary of the passage of the Ending Coal for Cleaner Air Act and acknowledging that Bruce Power was responsible for 70% of the extra electricity needed to phase out coal. That $10 billion we spent effectively enabled coal phase-out in Ontario.

As we look at the carbon-pricing regime that is expected, whether it's cap and trade at the provincial level or some other construct, one of the things the Asthma Society also concluded yesterday is that compared to the alternatives, our continued operation will avoid a lot of additional carbon costs. That's estimated to be between $12 billion and $63 billion over the next 50 years, or up to $14,000 per family, so as we're talking about clean air, it's important that nuclear gets mentioned in that equation.

Before I wrap up, there are two other important points. I know that the member of Parliament covering the Chalk River facility is here today, and she'll be very aware of this file. One of the key elements in our nuclear industry in Canada that is often not recognized is the contribution to the medical community internationally. Bruce Power, along with Glenn's facility over at Pickering, is the world's largest provider of cobalt-60.

If any of you folks ever have to go into the operating room of a hospital, you want to make sure that every single piece of equipment and any medical supplies are absolutely sterilized and clean. Over the last 30 years, we've seen a dramatic drop in infection rates in hospitals because all of that material is sterilized from the cobalt-60 we produce in nuclear plants around the world. Seventy per cent of the world's supply of cobalt-60 comes from the province of Ontario and Bruce Power.

Just two weeks ago, we announced a major project at Bruce Power. When the Chalk River facility ceases operation at the end of March, we will start to produce a new product called “high specific activity cobalt”. We're going to be one of the world's largest suppliers of medical-grade cobalt , which will be used to treat people with brain tumours and various forms of cancer. If you've ever had a loved one or a neighbour or a friend who has had a brain tumour and has been able to go in for this innovative medical technique, where they don't need to do operations but can effectively shrink a tumour through the gamma knife technology, all of that is going to be coming from Bruce Power in a number of years.

The final thing I would like to say in conclusion is that there has been a lot of talk about the regulatory regime in Canada. I certainly don't want to open up a full dialogue on that, but I want to share with you our perspective. If you were to come to the Bruce Power site today—and I encourage any of you to come to the site—you would see a very active level of engagement from our regulator. They're based on site. They're integrated into everything that happens on the site.

I recently had the honour of travelling to Vienna with a number of members of Parliament for the IAEA general assembly. I think Ms. Gallant and Ms. Rudd would be able to reinforce this. It is amazing how respected Canada's nuclear industry is on the international scale.

There is an international fleet of about 400 nuclear plants. Canada has a very small portion of that, with between 18 and 20 plants. We really punch above our weight as a country, and we should be very proud of that, not just from a nuclear operator perspective but also from a regulatory perspective. Canada's regulatory regime in the post-Fukushima period was one of the first to step up and was internationally recognized.

When I was at the IAEA in Vienna, what was also amazing to me was the significant role that CNSC staff play at the international level. We shouldn't underestimate the importance of that. There's always room for improvement, and we as nuclear operators always talk about “gaps to excellence” and how we can do better. I think that's a standard that we should always hold ourselves to, but we shouldn't confuse gaps to excellence with something that we, as Canadians from every walk of life and from every party, should be very proud of.

I think we have a strong story to tell as an industry. I'm thrilled to be here today to share that with you.

● (1000)

The Chair: Thank you very much.

Ms. Swami, are you going to take the mike for your team?

Ms. Laurie Swami (President and CEO, Nuclear Waste Management Organization): Yes. Thanks very much.

Good morning, Mr. Chairman and members of the committee. It's an honour to appear before you today as one of my first official acts as the new president and CEO of the Nuclear Waste Management Organization, or NWMO. My colleagues Derek Wilson and Elena Mantagaris are also here today to assist with any questions you may have.

I'd like to provide some background on the work currently under way at the Nuclear Waste Management Organization and provide an overview of where Canada stands relative to our peers in the world.

First of all, Canada has the required framework to move forward with safely managing used nuclear fuel over the long term. We have the benefit of a clear federal policy, a federal act, robust regulations, and sufficient funding. At the NWMO, our current work is focused on identifying an informed and willing host for a deep geologic repository. Our goal is to achieve a partnership with interested municipalities, first nations, and Métis communities, working together to implement the significant national infrastructure project that we have in front of us.

Let me run through a little bit of our history. The NWMO was established in 2002 by Canada's nuclear electricity producers as a requirement of the federal Nuclear Fuel Waste Act. Our mandate is to work collaboratively with Canadians to design and implement Canada's plan for the safe long-term management of used nuclear fuel. As a requirement of the act, we submit an annual report to the Minister of Natural Resources, who tables it in Parliament and issues a public statement within 90 days of receiving it. The 2015 statement indicated the following: “The Government of Canada believes strongly in the importance of the NWMO’s mandate, and will continue to ensure that the organization fulfills its responsibilities under the Nuclear Fuel Waste Act as it implements Canada’s plan for nuclear fuel waste.”

Ontario Power Generation, New Brunswick Power Corporation, and Hydro-Québec are the founding members of the NWMO. Along with Atomic Energy of Canada Limited, they are required to fund our operations. Trust and segregated funds have been established and are funded.

The Nuclear Fuel Waste Act required the NWMO to study approaches for managing used nuclear fuel and recommend an approach to the Minister of Natural Resources. In 2005, after a three-year dialogue that included 120 information sessions in every province and territory, the NWMO proposed an approach that best reflected priorities and values expressed by Canadians. We called that approach “adaptive phased management”, or APM.

The Government of Canada then selected APM in June 2007. The plan includes centralized safe containment and isolation of used nuclear fuel in a deep geologic repository located in an informed and willing host community. Following the government's decision, the NWMO undertook an additional two years of engagement with Canadians to collaboratively develop a fair and ethical site selection process that identifies technical and social criteria for suitability.

In May 2010, when the site selection process was initiated, 22 communities came forward and expressed interest in learning about this approximately $22-billion project. Following the initial screenings and preliminary assessments, the number of communities has been narrowed down to nine in Ontario. No decision has been made yet by any community to host the deep geologic repository. Like the NWMO, all are still learning. Over the next several years, NWMO will be doing technical studies and working with communities to identify a preferred site, followed by regulatory approvals. We estimate that the repository will be in service between 2040 and 2045.

● (1005)

There is international consensus that repositories are the responsible approach for managing used nuclear fuel over the long term. For instance, the IAEA and NEA recognize geologic disposal as a safe and permanent solution.

Like other countries, Canada is moving forward with an environmentally responsible approach that protects people and the environment. For example, Finland, Sweden, and France are all moving forward with repository programs. The U.S. Department of Energy is initiating a consent-based process to site a repository.

The NWMO is committed to excellence in research efforts. Since 2010 we have worked with 21 Canadian universities and colleges, as well as international centres of learning, on over 85 research projects. The NWMO is also working with research partners in Switzerland, Sweden, and Finland.

Adaptive phased management requires that the NWMO ensure technological innovations are incorporated in how we advance Canada's plan. For example, the NWMO has developed an innovative containment system with existing proven technology that is optimized for used CANDU fuel. This system can be manufactured entirely in Canadian facilities and could be used by companies looking to export Canadian expertise and materials in managing the back end of the CANDU fuel cycle. Adaptive phased management gives our organization the flexibility to respond to technological innovations and future changes in the nuclear sector, while ensuring the core mission of the organization can continue.

In conclusion, as stewards of Canada's plan, we take our responsibility to protect people and the environment extremely seriously. As mentioned earlier, we have all of the necessary frameworks in place to move forward.

We are happy to answer any questions you may have.

Thank you.

● (1010)

The Chair: Thank you very much.

Mr. Jager, we'll go back to you.

Mr. Glenn Jager: Thank you, Mr. Chairman and committee members, for inviting me to speak about Ontario Power Generation's deep geological repository and our industry.

OPG has a strong tradition of generating electricity for almost 100 years. It grew out of the Hydro-Electric Power Commission of Ontario and Ontario Hydro. In the first half of the 20th century, all of our assets were hydroelectric, which laid the foundations for the economic and social development of Canada.

Fossil plants followed in the fifties and the sixties as an additional source of energy to fuel a growing and thriving province. In the seventies and nineties, nuclear stations were added to that mix.

OPG owns three nuclear stations in the province, the Pickering, Darlington, and Bruce power stations, and together they produce more than half of Ontario's electricity—stable, clean, affordable, and safe energy that has helped Ontario and Canada move to a low-carbon economy. It was nuclear power that helped the province get off coal-powered electricity, significantly reducing the province's and the country's greenhouse gas emissions, and it will be this way as nuclear continues to be an integral part of our electricity mix and the decarbonization of our economy.

In October, OPG embarked on a $12.8-billion megaproject, the biggest clean energy project in the country, refurbishing the nuclear generating station, one of our most important assets.

As I mentioned earlier, Darlington generates 20% of the province's electricity and has done so since the early nineties. It needs a mid-life refurbishment, and we're spending 10 years to do just that. Once this is completed, Darlington will continue to provide to Ontario stable and cheap energy, free of greenhouse gas emissions, for 30 or more years.

As with any industrial operation, nuclear plants produce waste, and in Canada there are strict regulations around the storage and disposal of nuclear waste. Unlike gas- or coal-burning plants that send their waste up into the atmosphere, the vast majority of nuclear waste is solid. It's stored as per the rules of Canada's radioactive waste policy framework, which dictate that waste producers and owners are responsible for the funding, organization, management, and operation of disposal and other facilities required for their waste. The policy recognizes that there may be different categories for each waste category.

OPG is responsible for the interim storage and long-term management of low- and intermediate-level waste. High-level waste, as Laurie mentioned, is the responsibility of the Nuclear Waste Management Organization, the NWMO, which is in the process, as you've heard, of working on a plan for the safe long-term management of used nuclear fuel.

For 40 years, the low- and intermediate-level waste produced from the three nuclear plants has been safely stored at the Bruce generating station on Lake Huron. It has been trucked there without incident, and every single piece of waste generated over 40 years is accounted for. Currently, all the waste is stored safely above ground within the secure Bruce site.

The low- and intermediate-level waste is stored in concrete storage buildings and in in-ground containers. There are approximately 100,000 cubic metres of low- and intermediate-level waste stored there, about half of the total that would be placed into the DGR when it's done. The spent fuel is placed in dry storage containers at each of the three stations. The containers, designed by OPG, are made of reinforced concrete and carbon steel and weigh about 70 tonnes when full. Each container holds 384 fuel bundles and, to date, we've loaded 2,500 containers.

Just as we as a society are trying to deal with the carbon waste sent up in the atmosphere by fossil fuel use, we have an obligation to future generations to safely dispose of nuclear waste responsibly, where it cannot pose a threat to the public or the environment. In this vein, OPG has identified and has been working on a safe, permanent solution to manage low- and intermediate-level waste, a deep geological repository, or DGR. DGRs are recognized internationally as the best long-term solution for nuclear waste. DGRs are used safely in the United States, Finland, South Korea, and Sweden. Countries such as Germany, Switzerland, France, and Japan are among the other developed countries seeking to construct a DGR.

● (1015)

OPG's proposed plan would take the waste from where it's stored above ground, move it 100 metres, then 680 metres underground—lower than the CN Tower is high—and into some of the most impermeable rock on earth. The proposed site is designed to contain 200,000 cubic metres of low- and intermediate-level radioactive waste.

This isn't just OPG's best guess for disposal; rather, the project and the site have been subjected to a rigorous environmental and approvals process for nearly 16 years. It's been studied and peer-reviewed by scientists from around the world. In addition, the project has been the subject of nearly a decade of scrutiny, public hearings, and input from local residents.

A federal joint review panel was established in 2012 by the Minister of the Environment and the president of the Canadian Nuclear Safety Commission to study the proposal. It also agreed that it was the ideal site to permanently contain the waste, and recommended that the project be built sooner rather than later. As part of the process, OPG reached out to the Saugeen Ojibway Nation, or the SON. The site is located in traditional SON territory, and OPG has given its commitment to the SON that the DGR will not proceed to construction without the support of the SON community. The panel said the following in its report: “The Panel believes that important bridges have been built between the scientific information for this environmental assessment and the cultural and spiritual worldviews of the Aboriginal people who participated in this review.”

OPG also engages with and has the strong support of the host community, the Municipality of Kincardine, as well as neighbouring jurisdictions. Every study or review has concluded that DGR would not cause any adverse effects to the environment or Lake Huron.

Following the endorsement of the joint review panel, OPG continues to seek EA approval. The federal Minister of Environment and Climate Change has asked for three further studies, and OPG is finalizing its answers to those. OPG has committed to provide this additional information to the minister by year-end. Our results from those additional studies still show that the Bruce nuclear site remains the preferred site for the safe long-term management of low- and intermediate-level waste.

In conclusion, let me leave you with this observation from the joint review panel's report:

> The proposed DGR is an important, unique, precedent-setting project. It would be the first of its kind in North America, and it is the first of its kind in the world to propose using limestone as the host rock formation. It is likely that the knowledge and experience gained through the project will assist the Canadian government in its separate Adaptive Phased Management process for the long-term management of used fuel.

Thank you. I'm available to answer any questions you may have.

The Chair: Thank you very much.

Mr. Serré, you're first up.

Mr. Marc Serré (Nickel Belt, Lib.): Thank you, Mr. Chair.

Thank you to our witnesses for coming in today.

In the seven minutes that I have, I want to follow up on our earlier testimony. I agree that the Canadian nuclear industry is probably the safest in the world and a world leader, but we heard earlier from the audit, which I'm sure you've seen, that it has some pretty significant gaps and some recommendations that I'm sure you as an industry would want to....

I'm speaking now to both Bruce Power and OPG. What are you doing proactively to work with the regulator and the commission to address some of these gaps and to have them comply as soon as possible so that we can put this issue to rest?

Mr. James Scongack: That's an excellent question, and I completely agree with you. I think we have an industry in Canada that is respected internationally and has unprecedented levels of safety.

We always like to put the CNSC on the spot every year when all the operators in Canada go up to the CNSC for an annual review of our industry. It's an open, public, and transparent process whereby the CNSC openly rates the performance of nuclear facilities and operating plants across Canada. One of the statistics we always like to put up from the Bruce Power point of view—and I'm sure Glenn would share this from an OPG point of view as well—is that Bruce Power just exceeded six million hours' work without a lost-time injury. We're one of the industry leaders—and frankly, industrial leaders, if you look at any sector in Canada—when it comes to health and safety. Whether it's the Office of the Auditor General, the Parliament of Canada, or the CNSC, I can promise you that in most cases our lost-time injury rate and our safety performance are actually better than they are for people working in many of these buildings here today, and that is a really good benchmark. We're not only benchmarking ourselves against other nuclear plants; we're benchmarking ourselves against the best and the brightest.

With regard to the CNSC, we make it a policy not to comment on the audits of our regulator. We have enough audits of our own internally. We have permanent internal oversight functions within the company. We have independent audits that we, as operators, subject ourselves to. From a board perspective, we have an organization called the nuclear safety review board, which reports to our board. We bring in essentially independent experts on a quarterly basis to report to our board. It's an industry best practice.

We also open our doors to the World Association of Nuclear Operators on a frequent basis; a review of one of our facilities concluded just a week or so ago. There is also the IAEA.

I'm very hesitant to comment on an auditor's report of our regulator. I don't think that would be appropriate. I would say, though, that a common theme in any audit, including the ones we receive in Bruce Power, is that audits are meant to be.... How often have you heard an audit that gives a glowing review and says you don't have any room for improvement? I think this committee should be more concerned if an audit came out and said there wasn't any area for improvement, because when we talk about nuclear power, we're never satisfied. We never say that we have great safety performance and we're resting on our laurels. It's always about what we can do better.

That's one of the constant focuses we have as an operator. When we have good safety performances, we don't want our employees to think that's enough. It's always about the next thing.

I know I didn't directly answer your question, but that would be our perspective from an operational point of view.

● (1020)

Mr. Glenn Jager: The only thing I would add to that is we're all open and transparent operators. I think that assists the regulator.

We don't directly assist the regulator. It is meant to be an independent body that is looking at our operation. You can think of it as a series of layers. You begin with safe operation, and then external bodies and panels look at our operation in an audit framework. Independent regulators and international regulators all look at our operation through critical reviews, and they provide gaps or shortfalls to us, and that's how we improve. The regulator is looking at all of that. It looks at the integrity of the framework, and it's important that the regulator maintain that independence from us, and therefore we don't really comment.

Mr. Marc Serré: Thank you.

We heard from OPG about spent fuel. The NWMO is looking at the use of a geological repository for nuclear fuel waste. Can you provide us with some of your research or other options you are looking at when we consider how to deal with our spent fuel?

Ms. Laurie Swami: With regard to other opportunities for used nuclear fuel, in 2007, as I mentioned, the government decided that the APM program was the correct way forward for Canada in terms of how to deal with used nuclear fuel. That includes an end point of a deep geological repository.

As part of that and part of the work that we do at the NWMO, we also stay abreast of any international developments there may be in the area of other opportunities or other ways of dealing with used nuclear fuel. We have not identified anything at this time for which there is international consensus that it is better than a deep geologic repository, so we stay committed to implementing the APM program, as approved by the government in 2007.

The Chair: Go ahead, Mr. Strahl.

Mr. Mark Strahl: Thank you, Mr. Chair.

I have one quick question for Bruce Power, and then I'm going to give the rest of my time to Ms. Gallant.

On the $10 billion invested in Bruce Power since 2001, and for your future $13-billion investment, is that all private sector investment, or are you receiving a government subsidy?

● (1025)

Mr. James Scongack: That's a great question. One hundred per cent of it is private sector investment. Looking back and going forward, there's not one penny of government subsidy.

Mr. Mark Strahl: Thank you.

I'll turn my time over to Ms. Gallant.

Mrs. Cheryl Gallant (Renfrew—Nipissing—Pembroke, CPC): Thank you.

Through you, Mr. Chairman, when the president of the CNSC was before this committee on November 17, he spoke of a so-called consensus to bury nuclear waste.

I understand that there is a provincial study under way in Ontario to examine a smarter way to deal with unused nuclear material: to recycle it. As we know, just 1% of the energy in a fuel rod is actually utilized during the time it's in the CANDU reactor. Unlike those of our nuclear competitors, the CANDU system is superior in that our technology can use reprocessed fuel from light-water reactors, and it can also be used for thorium.

I'm wondering whether Bruce Power and OPG would be supportive of a plan to recycle fuel if the technology is developed economically, or are OPG and Bruce Power committed to the DGR for fuel disposal?

The Nuclear Waste Management Organization was formed in 2002, and for over 14 years we've had significant technology advances. That's why I'm asking the question. That's for anyone.

Mr. Glenn Jager: I'll start.

Those technological advances are still under way. I think what you're talking about is “fast reactors” and reusing the spent fuel from CANDU reactors. There's still value if you were to put it into one of those types of reactors. That's very new technology. It's going to take a lot of development. For Canada, it would mean introducing fuel reprocessing capability, which is a capability we don't currently have.

Would we be interested? Yes. We're absolutely following that in looking at future uses. Is that a technology that will emerge as an economic and viable source of energy? I would tell you that it will take significant investment and development to reach that world-wide. It's at a very early stage. Notwithstanding that, you would still have to deal with the spent fuel. It doesn't get us away from the need for a DGR, but it would allow us to potentially use that spent fuel. We're monitoring that, but it's very early in the technology's development.

Mr. James Scongack: To build on Glenn's comments, from our perspective as a nuclear operator, our top priority is to ensure there is a process available that ensures this liability is fully funded, right? Since we're leasing the facility from Ontario Power Generation and the Province of Ontario, what's important for us is that when our facility ceases operation, we have fully funded that liability through our operational streams for whatever the best solution is as determined by the NWMO.

To give you a sense of what that liability looks like, there's a significant focus on fuel, but just to put the cost in perspective, right now we're paid about $66 a megawatt for all of our output on the Bruce Power site. About $4 of that $66 covers the cost of fuel. The most important issue for us, Ms. Gallant, is really that we ensure this is a fully funded liability based on the best available technology at the time.

It's really up to the NWMO to decide on the best available technology to deploy. The best-case scenario for our industry—and I think Ms. Swami mentioned they're always on the lookout for what's going on with new technology—is that we could actually have an overfunded liability down the road if technology progresses, but we have to make some assumptions based on what's available to us now and make sure we're funding to that. From our perspective, that's critical.

Mrs. Cheryl Gallant: When will the OPG be replacing the Pickering Nuclear Generating Station of, as I understand, 3,000 megawatt-hours, with at least four new reactors to maintain the base load capacity and to maintain the clean air standards? Otherwise, we'll have to continue to use the gas plants for electrical generation. Are there plans under way to have those refurbished?

● (1030)

Mr. Glenn Jager: Currently Pickering is planned to cease commercial operations in 2024. That's what we're working on right now. There are no current plans to construct a replacement nuclear power reactor to replace Pickering, but we do have a licensed site and a licence to construct adjacent to the Darlington facility. There are some decisions on technology and vendor, and by the province on whether or not they'll proceed to construct a facility and whether it would be an SMR or large-scale nuclear on the Darlington site.

Those decisions haven't been made. They would be made in the course of producing a long-term energy plan and the province's energy plan. The replacement power for Pickering would be largely obtained from existing capacity or gas power installations, or renewable energy in the short term.

Mrs. Cheryl Gallant: Okay.

With respect to the Nuclear Waste Management Organization, how much money has been spent since 2002 through your organization for studies and preparation, total?

Ms. Laurie Swami: I'm looking at my colleagues, because I'm relatively new. I don't have the total amount we've spent since 2002, but I would be happy to provide that after this session.

Mrs. Cheryl Gallant: Please provide that in writing to the committee. Thank you very much.

The Chair: Thank you very much.

Mr. Cannings is next.

Mr. Richard Cannings: Thank you, Chair.

I'd like to thank you all for coming here today.

Mr. Jager, you mentioned the first nations approval process that's going on. I'm wondering how that's going. You kind of implied that you wouldn't proceed without that approval, and I just wondered if that's what you meant. If you don't get that approval, do you have a plan B?

Mr. Glenn Jager: First of all, we committed to the SON that we would not proceed without their concurrence, so they effectively have a veto on the DGR facility. Discussions with the SON are proceeding very well, I would say. They have a very good perspective on nuclear power within their territory and the need to responsibly manage waste. In that vein, I think the dialogue is very good. We'll take the necessary time to reach that consensus. I am hopeful that we will get that consensus. Notwithstanding that, they absolutely have a veto. We committed to them that ultimately they have a veto on DGR proceeding.

As for a plan B, we don't have a well-developed plan B. If that were to come to pass, we would have to site and study an alternate location. That's really what it would come down to.

Mr. Richard Cannings: I just want a clarification about the lifetime of Darlington. I guess it's about 26 years old now as you're starting this refurbishment. You said it would last for 30 to 40 years more. Is that from the end of the refurbishment or from now? When would you be looking at decommissioning Darlington in the future?

Mr. Glenn Jager: The items that govern the life of each unit are the pressure tubes or the reactor core components. The life starts as soon as those components are replaced. On a unit-by-unit basis, the lifespan is dictated from when those components are replaced. Each unit will be replaced initially with a three-year interval and then 19-month after that. It's 30 years following that component replacement. It can be up to 40 years, depending on how those pressure tubes perform.

That's part of the evaluation of the life of the plant. We look at the health of the pressure tubes and how they are aging. We complete the necessary inspections and studies. From that we're able to forecast the life of the pressure tubes. The minimum would be 30 years. I would expect 35, 40, or beyond, in fact. That's how we govern the life of the plant. At that time you can make a decision on whether to refurbish it again or retire it.

In the case of Darlington and Bruce Power, the economics are pretty clear. They're large units. It's very economic to refurbish the power plants. With Pickering they're smaller units, so it's less economic to do so, and that's why the decision was to retire Pickering. The decision for Pickering would be to build a new facility, one that is more economic than Pickering.

● (1035)

Mr. Richard Cannings: Okay.

Ms. Swami, in the process of choosing the site for the new facility, you said you started with 22 communities. Now it's down to nine that were "informed and willing", I think were your words. I gathered that you wouldn't choose a site unless they had given some form of consent. I want to know how you measure that consent and the process for choosing that final site. What are the principles you're looking at?

Ms. Laurie Swami: In siting a waste repository of this nature, a deep geologic depository, it's an important principle that we have a willing host and that we can demonstrate safety of the repository. Those are two fundamental elements of the work.

In our work going forward in selecting a particular site, we will work with the communities, whether it's the municipalities or first nations and Métis communities in the specific area, as well as adjacent communities, to make sure they understand and acknowledge what the project would be about, what the particulars are around the design, and what it would mean to the environment. We would educate them, and should they choose to continue in the process, because this is a consent-based process, they would gain an understanding and begin to work with us in a real partnership. We really value the partnership we would develop with all the communities and that the communities would develop within themselves.

As we go forward, we would be looking at both the support and recognition that the community would be interested in proceeding, as well as the safety analysis and the safety case around the deep geologic repository.

It is a difficult thing to measure specifically, but we would be looking to the community to identify how it would see itself fitting into the process and whether it would like to continue with us.

That's essentially the process we would be looking toward.

Mr. Richard Cannings: To Bruce Power, I have a technical question on the cobalt situation. You said that Ontario produces 70% of the world's cobalt now. After Chalk River winds down and you change your process, would Ontario still be producing 70% of the world's cobalt?

Mr. James Scongack: It's a great question. Just for clarification, when we talk about cobalt, we're talking about two kinds of cobalt. Not to get overly technical, there's what they call "low specific activity cobalt" and "high specific activity cobalt". Low specific activity cobalt is used in most sterilization internationally. When I was referring to the approximately 70% of the cobalt-60 supply internationally, I was referring to low specific activity cobalt, and that comes from Glenn's facility at OPG and our facility at Bruce Power.

Obviously what's really important to the Canadian market is that we secure that cobalt supply long term, especially when Pickering reaches its end of life. I believe, Glenn, a week or so ago, Bruce Power and OPG signed an MOU together to look at the situation when Pickering reaches its end of life and some of our units, both at Bruce and OPG, aren't producing cobalt. What are the technical options for producing cobalt, so that we maintain that market supply?

Our plan is to replace a good portion of the high specific activity cobalt, which is currently produced at Chalk River, starting in Q1 of 2019, following the closure of the NRU in March 2018. The NRU will close, and there will be a significant HSA cobalt harvest at that point. We will have loaded the HSA cobalt literally in its last week, and it will cook for three years. When we have an outage starting in 2019, we will remove it at that point.

● (1040)

The Chair: Thank you.

Mr. Tan, you're next.

Mr. Geng Tan: Thank you, Chair.

When AECL was here two days ago, the committee heard that AECL used to have three divisions. The first division, CANDU energy, is now sold. The second division, the R and D division, is at Chalk River and has been under the so-called go-co model. The third division is called the liability management, or more precisely, the waste management division.

NWMO, your organization, if successful, I assume will be very active and will very likely take care of most of the business on nuclear waste management. How would your organization work with AECL's third division, the only division under the direct management of AECL?

Ms. Laurie Swami: AECL has a number of waste liabilities. They have low- and intermediate-level waste and some small amount of used fuel. My organization is responsible for the management of long-term solutions for used nuclear fuel, so a small portion of the material from AECL will be managed through the program my organization is responsible for.

On the broader question of co-operation among the waste owners, we do share information. We look to each other for operating experience and the different technologies available. We work collaboratively within the industry to make sure we're able to learn from each other and share and bring to bear all the available technologies. However, the responsibility of my organization is separate from a large portion of the liabilities that AECL is responsible for.

Mr. Geng Tan: It sounds as if AECL will still have the biggest share of the business on nuclear waste management.

Ms. Laurie Swami: Generally speaking, there are major players in the waste business. Ontario Power Generation—and I don't want to speak for Glenn—has a large portion of the low- and intermediate-level waste, as well as the used fuel. They are also, like AECL, a large component of the discussion. Hydro-Québec and New Brunswick also have a share, a smaller share, based on the size of their generating footprint. OPG owns all the waste from Bruce Power as well as from their own operations

AECL and OPG are the two large arms, and Nuclear Waste Management Organization's role is to accept the used fuel, which will come predominantly from OPG, then through New Brunswick Power, Hydro-Québec, and a very small portion of AECL's material.

Mr. Geng Tan: Since the beginning of the operation in 1970s, more than five decades ago, OPG has built up a lot of expertise running a nuclear facility safely and efficiently.

Mr. Jager, do you see any need or any opportunity to market OPG's experience and know-how to other countries? This is not only to generate revenue for Canadians, but I also believe it is a very effective way to promote CANDU technology worldwide.

Mr. Glenn Jager: OPG and all the operators in Canada support all the companies that market their services and manufacturing components abroad. From an operator's standpoint, we don't directly sell components or services per se, but rather support the industry within Canada that does that, and it does a lot of work abroad.

Again, from an operational standpoint, the safety and reliability and the investment Canada makes in its nuclear industry directly affects or impacts the ability to market our manufacturing and services abroad. It's a very important underpinning.

When you look to the future, it's important to maintain, continue, and have a plan for the investment of new technologies or introduction of new reactor types, because you want to be on the leading edge to position that manufacturing base and that expertise within Canada, and to be able to market it abroad.

Today we do a lot of work abroad. OPG has a very small services company, but primarily we support the companies that manufacture within Canada and provide services internationally.

● (1045)

The Chair: I think we'll stop there.

Thank you very much to our witnesses. We're very grateful for you taking the time to be here, and travelling, especially in this weather. We wish you safe travels back home.

Thank you to Mr. Sweet, Ms. Gallant, and Ms. Mendès for attending today as well.

The meeting is adjourned.