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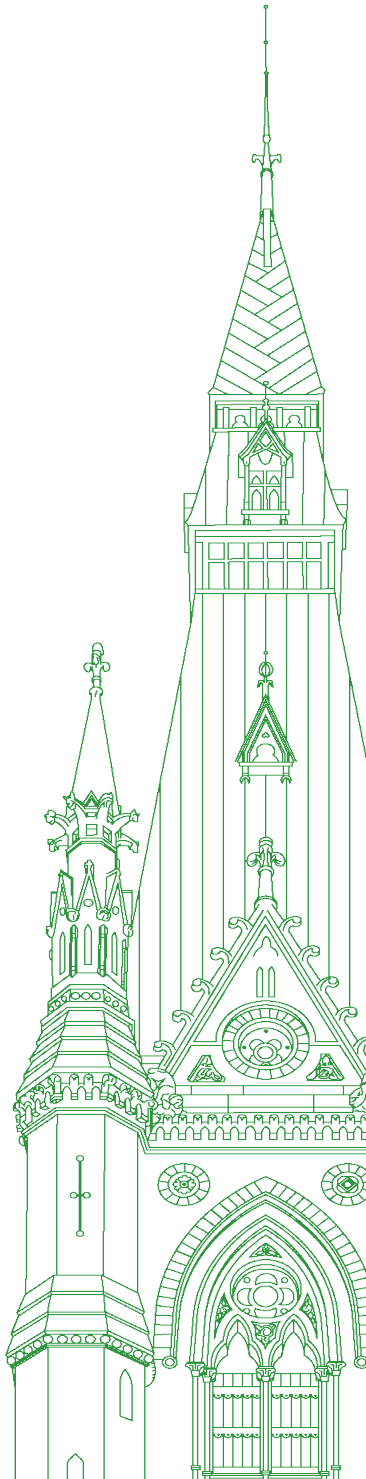

Chair: Mr. Francis Scarpaleggia

Standing Committee on Environment and Sustainable Development

Tuesday, March 1, 2022

● (1100)

[*English*]

The Chair (Mr. Francis Scarpaleggia (Lac-Saint-Louis, Lib.)): Good morning, colleagues, guests and panellists. I would like to call this meeting to order.

This is meeting number six of the House of Commons Standing Committee on Environment and Sustainable Development. Today's meeting is taking place in a hybrid format. I would like to remind all participants that the taking of screenshots or photos of your screen is not permitted.

Given that we are still in a pandemic, the directives of the Board of Internal Economy remain in place. In other words, if we're here in person, we should respect two-metre distancing, wear a non-medical mask when circulating in the room and maintain proper hand hygiene by using the hand sanitizer provided at the room entrance.

For panellists who are not used to our hybrid meetings, you can speak in either official language, as you wish. When you are not speaking, however, put yourself on mute to prevent ambient noise.

On that, I would like to welcome two new members to the committee. From the Conservative Party, we have Mr. Kyle Seeback and Mr. Colin Carrie. Welcome. I hope you enjoy your stay at our committee and I hope that you are with us for a very long time. I think you will enjoy the work that we do. It's very interesting and I believe we're a very collegial committee.

I imagine the Conservatives will want to proceed—though we could also do this on another day, if you prefer—by proposing a new vice-chair. Is that correct?

Mr. Kyle Seeback (Dufferin—Caledon, CPC): Yes.

The Chair: Please, go ahead.

Mr. Kyle Seeback: I'd like to nominate Mr. Dreeshen as vice-chair.

The Chair: Perfect. Are there any other nominations? No.

(Motion agreed to)

The Chair: It's confirmed. Mr. Dreeshen, welcome aboard as vice-chair. We're happy to have you in that position.

I would like to take the opportunity to thank Mr. Albas and Mr. Davidson for their fine work on the committee.

Mr. Kyle Seeback: [*Inaudible—Editor*] used to getting almost 100% of the votes, but he got 100% this time.

Mr. Terry Duguid (Winnipeg South, Lib.): Even from the Liberals.

The Chair: That's nice. That's really good.

On future business, I'll be very quick. We've invited the minister to appear on the 24th to speak to the main estimates and supplementary estimates (C). I don't know if we have confirmation yet, but we're reserving that meeting for the minister.

I'm planning on calling a meeting for March 10, during the break week, so that we can finish up with the review of the report from the plastic study and give drafting instructions to our analysts for the report of the nuclear study.

Please watch your inboxes for meeting notices for March 10. That's two Thursdays from now.

I would like to welcome—

Mr. Kyle Seeback: Mr. Chair, I don't want to interrupt too much of the meeting but I spoke to you about this. We'd like the minister to come for two hours, because normally we would have him for the supplementaries for an hour.

The Chair: Yes, you spoke to me.

Mr. Kyle Seeback: If we need to discuss that, I propose we discuss it after the meeting and after we've heard from the witnesses.

The Chair: Okay. It's noted. We'll put in that request for two hours, I don't know if there's much discussion required around the request, but consider the request made. Of course, we can discuss it in camera if there needs to be more discussion, Mr. Seeback, on the 10th, for example.

I'd like to welcome our panellists. I don't know if Chief Duncan Michano is with us.

A voice: Not yet.

The Chair: Okay. He'll be joining us.

As individuals, we have Dr. Ramana, a professor at the school of public policy and global affairs at the University of British Columbia, and Dr. Jeremy Whitlock, section head of concepts and approaches in the department of safeguards at the International Atomic Energy Agency.

I would like to invite Dr. Ramana to give some opening remarks for three minutes please.

● (1105)

Dr. M. V. Ramana (Professor, School of Public Policy and Global Affairs, University of British Columbia, As an Individual): Thank you very much for providing me with this opportunity to speak with you. My name is M.V. Ramana and I teach at the School of Public Policy and Global Affairs at the University of British Columbia. The University of British Columbia is located on the traditional, ancestral and unceded territory of the Musqueam people.

I carry out research on various technical and policy challenges associated with nuclear energy and small modular reactors. I will focus my remarks on the implications of the potential deployment of SMRs, small modular reactors, for the governance of nuclear waste in Canada.

My research shows that SMRs cannot solve the problems confronting nuclear energy, specifically its inability to compete economically with alternative sources of electricity. If they are actually constructed, SMRs could accentuate this problem.

The term “small modular reactor” actually encompasses a wide variety of reactor designs and these produce different kinds of nuclear waste. The SMRs being considered for possible deployment in Canada in the foreseeable future all have one common feature: They are all very different from the traditional CANDU reactor designs.

The designs I'm referring to are the ARC-100, which is a sodium-cooled fast neutron reactor; the micro modular reactor, a high-temperature gas-cooled reactor; the BWRX-300, a light water reactor; and Moltex, a molten salt reactor coupled with a reprocessing plant.

Each of these will produce radioactive wastes that vary in characteristics such as chemical composition, physical form and uranium enrichment. These differences mean that the methods developed for dealing with CANDU reactors will not work as such for these wastes. For example, a geological repository will have to account for the higher uranium enrichment levels because of concerns about criticality.

Some SMR designs envision the reprocessing of spent fuel. Advocates of reprocessing claim that it solves the waste problem, but except for most of the plutonium and uranium, the radioactivity present in the spent fuel is redistributed among different waste streams that enter the environment sooner or later. Most models of repository behaviour suggest that the radioactive doses to the public in the long term are dominated by long-lived fission and activation products, which will not be taken care of by reprocessing. Therefore, reprocessing makes little difference to long-term management of nuclear wastes, while making nuclear weapons proliferation easier.

The challenge with some of the wastes generated by SMRs is their chemical nature. Wastes from molten salt reactors could be in chemical forms that are not known to occur in nature and thus unsuitable for geological disposal. For fast reactors like ARC-100, the problem is that metallic sodium is very reactive.

The historical experience with wastes generated by earlier reactors of similar design reinforces these concerns. For example, the fluoride salt wastes generated by the Molten Salt Reactor Experiment that operated in the United States have been very difficult to manage, and the Oak Ridge National Laboratory has been spending about $10 million every year for decades, all for a small eight-megawatt reactor that operated for under four years.

To summarize, borrowing from George Orwell's *Animal Farm*, I would say that all radioactive wastes are problematic, but some radioactive wastes are more problematic than the others.

I'm happy to answer any questions you have. Thank you.

[*Translation*]

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

Mr. Whitlock now has the floor for three minutes.

[*English*]

Dr. Jeremy Whitlock (Section Head, Concepts and Approaches, Department of Safeguards, International Atomic Energy Agency, As an Individual): Good morning, and thanks for this opportunity to address the committee.

“Nuclear waste” is a term strikes fear into the heart of many people, along with terms like “radiation”, “nuclear reactor” and “nuclear accident”. This makes rational conversations about these topics very difficult, which I can verify as someone who's been trying to have this conversation for over 40 years. This also makes big decisions about these topics very difficult because decisions, at least the good ones, need conversations.

Here's the challenge because, folks, we need to make some really big decisions if we're going to fix the problems on this planet. The biggest of these problems involve what we do with our waste, all kinds of waste, including how to make less of it and, more importantly, how to help the rest of the planet live as comfortably as we do, which most don't, without making as much waste as we do.

In Canada these big decisions will be made by ordinary citizens, and this is a challenge if we want these decisions to be made based on objective evidence, because that's not typically how humans think. Simply put, we need to have rational conversations with Canadians and indigenous peoples about waste, which includes listening.

The nuclear community has not been particularly good at this in the past, with some exceptions—the NWMO is one of these, in my opinion—and that is why 80 years after Canada led the world in discovering the most promising source of energy, health and prosperity ever harnessed on this planet, we're still sitting here worrying about autocrats and warmongers controlling vital fossil fuel supplies, wondering if we can turn around climate change and trying desperately to meet our moral obligations to do something with our waste.

Fifty years ago, Canada started a process to solve this last problem for used nuclear fuel. We're now on the cusp of implementing that solution and it needs a conversation with ordinary citizens. We need to talk about the real risks and what we plan to do about them. We need to talk about how our science learns from nature herself in isolating radioactive materials for billions of years. We need to talk about how everything we do generates waste that lasts a long time and how used nuclear fuel can uniquely be managed for this entire period due to being relatively low in volume, robust and all in one place.

We need to look beyond safe, indefinite surface storage, which we do now and are very good at. Inevitably, however, glaciers will again cover Canada with ice, up to four kilometres thick, destroy everything on the surface and spread it around the continent for future civilizations to find. So we need to talk about how the one waste these future civilizations will not have to worry about will likely be the used nuclear fuel safely ensconced in stable rock, safe from earthquakes, hurricanes, warmongers and glaciers. It's long-term geological stewardship, as nature has taught us.

Let me close by saying that I deeply believe that equity of health and prosperity on this planet, sustainably achieved, is the noblest of human causes, and this was a big part of my decision to become a nuclear scientist.

Thank you.

● (1110)

[*Translation*]

The Chair: Thank you, Mr. Whitlock.

We will begin the first round of questions, and Mr. Dreeshen will open the session.

[*English*]

Mr. Earl Dreeshen (Red Deer—Mountain View, CPC): Thank you very much, and certainly to the witnesses, it's great to hear your perspectives on what we are discussing here at the committee for nuclear waste.

Of course, this morning we've heard testimony discussing global security issues associated with the nuclear energy industry, the reality of spent fuel management and the unique designs that allow for massive power generation without the downstream CO2 production. Moreover, we've again just heard about the safety aspect of deep storage of spent fuel for future civilizations through glacial action and how different communities are also fearful of any nuclear expansion. When it comes to glaciers, I go about 70 miles from my place and I look at the sign that said 10,000 years ago we were under a mile of ice. The rivers that we now have came because of that. I know it seems a little odd to talk about what happens for civilizations tens of thousands of years from now, but these then do become realities. It's an interesting discussion that we have.

Mr. Whitlock, your role is to ensure that reactor design at AECL meets international obligations on nuclear weapons non-proliferation, and you're also aware of Alberta's interest in SMRs. You've done extensive work on the long-term management of spent nuclear fuel.

I'm wondering what advice you can give the committee regarding the proper management of nuclear waste now and for the future.

● (1115)

Dr. Jeremy Whitlock: Just to clarify, I'm not responsible for anything at AECL. I work in Vienna for the International Atomic Energy Agency. I do work in the area of nuclear safeguards that are applied to all countries, including Canada. In the past, I worked at AECL, and I certainly addressed the issues of spent fuel management.

The question is, what can we do best now and into the future? What we can do now is, essentially, what we're doing now. We have surface storage of nuclear waste that is among the best forms of storage of waste on the planet. It's remarkably robust. Looking at used nuclear fuel, that is the reason why we can do it, because it is a robust material in the first place and, as I mentioned, it's all in one place.

What we're doing right now is fairly good. You mentioned, and I understand why, that it's odd to talk about future civilizations. It certainly is odd, but when you think about it, that's what we're talking about with geological repositories. Otherwise, there's no reason to change what we're doing now, because we're doing a very good job. If you visit the nuclear sites in Canada, you'll see where all the nuclear spent fuel is from the reactors, and it's very safe. That's good for hundreds of years, and good for as long as we can make civil structures.

Civil structures won't last forever, and neither will civilizations. We do have to worry about the glaciers, and not just the next glaciers but the glaciation period after that, and the one after that. They'll come every several tens of thousands of years, and that is all within the life of this material. That is all within the life of any toxic material that's out there. We are looking at only nuclear waste, when we talk about this time frame. I wish we could treat all toxic material the way we treat spent nuclear fuel, and the way we look to the point hundreds of thousands of years from now instead of just hundreds of years in dealing with it.

You did say it's odd, and odd is one of the reasons why it's hard to have this conversation with Canadians, because it is something that is way beyond—even hundreds of years way beyond—the normal horizon of people's imaginations.

Why are we talking about tens of thousands of years or hundreds of thousands of years? With nuclear waste, you can put pretty good numbers on the waste, because we have it all in one place, it's all in front of us, and it's highly characterized. As soon as you put the numbers on the waste and say how long it's going to last, then people get scared. They don't realize that there's a lot of other waste out there, and a lot of it's not kept in one place, but because we can put the numbers on it, it raises people's fears about how long it lasts.

Mr. Earl Dreeshen: Thank you very much.

I'd like to address what you've said in your discussion with Dr. Ramana.

In your assessment—and I've read some of the work that you have done—there have been improvements in new reactor technology. I'm curious about how that works. You also discussed the fact that SMRs and the different types of cooling processes they have are different from CANDU reactors.

Is there that opportunity, though, to still have, as Dr. Whitlock had said, these products and to put them in deep geological areas so that this can be solved?

[*Translation*]

The Chair: You have 40 seconds left to answer the question.

[*English*]

Dr. M. V. Ramana: In principle, the answer is yes, but because the wastes are in different chemical forms, there would have to be a lot of pre-processing done before it can be placed. In some of the waste that we have seen in molten salt reactors in the United States, for example, those methods have still not been demonstrated. There is still waste that was generated 50 years ago that has still not been placed anywhere, because it's not in a form that can be placed anywhere.

[*Translation*]

The Chair: Mr. Dreeshen's time is up.

Thank you very much.

[*English*]

Mr. Earl Dreeshen: Thank you very much.

[*Translation*]

The Chair: I now give the floor to Ms. Taylor Roy for six minutes.

[*English*]

Ms. Leah Taylor Roy (Aurora—Oak Ridges—Richmond Hill, Lib.): Thank you very much, Mr. Chair.

Thank you to both witnesses for being here this morning.

This is a very important conversation, of course, and, Mr. Whitlock, you mentioned that ordinary Canadians are involved in this decision-making and will help make these decisions, yet in listening to your testimony this morning, and to Dr. Ramana's, I'm hearing slightly different things. I want to ask about one aspect of it, because you're a nuclear physicist and a professor emeritus, a specialist in this area, and you're having a conversation that is not completely aligned in terms of what the risks and proper handling are of this.

For ordinary Canadians to have those rational conversations, how much information do you think the people who are living in these areas have? We're down to two possible sites for the geological repository. How informed do you feel the people in these areas are about what this means for their region—not just for their town, but their region—and about how the waste will actually be moved and handled before it's put into these deep geological repositories?

● (1120)

Dr. Jeremy Whitlock: Thank you for that question.

I think there's a range of awareness in these communities. There are some that are very informed because the NWMO has done a good job of providing the available information, but you can lead the horse to water, and if it doesn't want to come to the water, it's not going to get the water.

There are also large factions that I would say aren't very well informed, but they're just as vocal or more vocal. I think this is a problem in these small communities, because it's sometimes neighbour versus neighbour. I watch with great interest this process. I'm curious to see how the NWMO will adjust to this now that it's coming down to these two communities and it's not academic anymore: It's one or the other.

The ones that are fully informed and are for it are aware of all the opportunities not only for their community but for Canada. The ones that aren't are just very scared, and it's okay to be scared. That's a valid response, but we also need to have that conversation.

I worry—I don't know, but I worry—about when the final decision is made and it's a referendum or some sort of community decision, which it will be, how informed all the different sides will be, as in any community decision, in any popular decision, but in this case, it's a major question, though.

Ms. Leah Taylor Roy: For sure, I know it is, and I appreciate that. I'm just intervening because I want to also hear the thoughts from Dr. Ramana.

In this committee, I think we have heard from many sources about the benefits of nuclear energy, and we know what it means in terms of meeting our emissions, etc. I think this study is about handling the waste, so when we're talking about these communities, I really think it is about the safety and how the waste is being handled. You say that those who are informed would make the decision to go ahead with this.

Dr. Ramana, you seem to have a slightly different perspective on some of this. I'm just wondering.... You seem to be informed as well, so maybe you could elaborate a bit on what your perspective is on it.

Dr. M. V. Ramana: I would say two things.

One is that there's a wide range of information, and what the NWMO presents is just one aspect of that. If you look at studies of public attitudes towards technologies in general, and nuclear power in particular, they are concerned about a range of issues. It's not just one particular number, whether it's the volume of waste or the probability of the radioactive dose that might come from it or something like that. They're concerned about potential risks to future generations. They're concerned about the possibility of major accidents and things that may go out of control. Secondly, they're also concerned about what they will be able to do in the event of one of these things.

When you look at all those studies, all you can conclude is that the technical approach to saying that these are the only things that matter and that this is the only information that matters, is sort of second-guessing what the public ought to know.

The other point I want to say is that talking about the benefits of this—but in terms of jobs, in terms of the amount of investment that will be going into these communities—is like offering them a small bribe, in a way, dangling a big golden carrot in front of them in exchange for their accepting certain risks.

I think these discussions—and here I agree with Dr. Whitlock—often tend to be very problematic, but they're problematic precisely because of the particular nature of this—

Ms. Leah Taylor Roy: I know I have a couple more minutes left. Do either of you have any specific recommendations on how to handle this issue? I think it is a very important one, the idea of informed consent and, obviously, being sure that the communities affected are well informed and give their consent freely.

● (1125)

Dr. Jeremy Whitlock: I mentioned in my opening remarks the importance of listening. Dr. Ramana touched on this as well. We can't just define the problems; we have to listen to what people think the problems are, which might be problems we didn't even think about, but what they think the issues are, and we need to address them.

I think listening is very important. I think the NWMO, as I mentioned, has done a good job at this. They spent the first three years of their existence doing exactly that, and I think that's key. It's having the conversation, creating time so it's not just a quick sound bite and not a meme on a Facebook page, but it's talking with them.

[*Translation*]

The Chair: Thank you.

I now give the floor to Ms. Pauzé.

Ms. Monique Pauzé (Repentigny, BQ): Thank you, Mr. Chair.

I thank the witnesses for being here.

My first question is for Mr. Ramana.

About a year ago, you submitted a brief to the New Brunswick Minister of Natural Resources and Energy Development that dealt specifically with the development of small modular reactors. In this brief, which I invite you to table with the committee, you discuss in great detail the significant costs of this technology, not to mention the costs related to the management of radioactive waste produced by the projects. In particular, you talk about the sodium coolant of the coveted and controversial Moltex project, which involves a new category of liquid waste. This is all in your submission.

Can you explain the magnitude of the financial and environmental costs associated with managing radioactive waste, compared to wind, solar or hydroelectric power projects?

[*English*]

Dr. M. V. Ramana: I'm sorry, my interpretation did not come through; I couldn't understand. I'm sorry, I don't speak French.

[*Translation*]

The Chair: Is the interpretation problem solved now?

It doesn't seem to be. So we'll stop.

[*English*]

Mr. Kyle Seeback: Mr. Chair, he might not have put his Zoom on English.

A voice: Mr. Chair, the interpretation came through.

The Chair: Dr. Ramana, at the bottom of your screen there's an icon.

Dr. M. V. Ramana: Oh, okay, sorry.

The Chair: Could we start over?

Mr. M. V. Ramana: I'm very sorry about that.

The Chair: It's all right.

[*Translation*]

Ms. Pauzé, please repeat your first question. We will give you your six minutes.

Ms. Monique Pauzé: Mr. Ramana, a year ago you submitted a brief to the New Brunswick Minister of Natural Resources and Energy Development on the issue of small modular reactors. In that brief, which I invite you to table here at our committee, you talk about the significant costs of the technology itself, and you also talked about the costs of managing the radioactive waste produced by these projects. In particular, you talk about the new category of liquid waste from the sodium coolant of the Moltex project.

Can you explain the magnitude of the financial and environmental costs associated with radioactive waste management compared to wind, solar or hydro projects?

[*English*]

Dr. M. V. Ramana: I will talk about two different economic costs, one of which is building these small modular reactors and generating electricity from them. That is going to cost much more than alternatives like solar and wind because small reactors lose out on what we call “economies of scale”.

There's a reason CANDU reactors started small and became larger and larger. They were trying to take advantage of the fact that you'll not require five times as much concrete or five times as many workers to build a 900-megawatt reactor compared with a 180-megawatt reactor. When you go small, you're losing out on those economies of scale, so the cost per unit of power capacity or electrical energy generated would be higher for small reactors.

The cost of dealing with nuclear waste is literally a small fraction of this cost, but it is something that is going to be important when you consider different alternatives, or different kinds of waste management practices, as well as different kinds of reactor designs. In the case of small modular reactors, as I mentioned in the case of ARC-100 or the Moltex design, there would have to be an enormous amount of preprocessing done before these wastes can be converted into a form that can be placed inside a geological repository.

I mentioned some cost figures that we know from Oak Ridge in the United States. These are quite high compared with other kinds of radioactive waste forms. We do not have a complete figure, because there's uncertainty about how exactly these wastes will have to be processed.

I hope that answers your question.

● (1130)

[*Translation*]

Ms. Monique Pauzé: You're a numbers person.

Around 20 serious failings that were found in the document for commissioners, known as the CMD, were not corrected for the hearings that began on February 22.

How do you perceive these failures, which are in clear contradiction with the principles and recommendations?

[*English*]

Dr. M. V. Ramana: The claims about costs that we see made by some developers are very optimistic and intended to make their technology seem more acceptable and economical than it really is. As I said, I don't think anybody really knows these costs, because these methods have not yet been perfected.

We also do not have experience with operating the repositories to the extent that we have these experiences. For example, in the waste isolation pilot plant in New Mexico in the United States, there was an accident that happened within 15 years of the waste site being commissioned. Dealing with that accident accident cost billions of dollars.

How do we account for these kinds of potentialities? Does the cost of waste storage include those potential accidents? The answer is no.

[*Translation*]

Ms. Monique Pauzé: We know that things moved very quickly for the Chalk River project. Are there any underlying economics to that timeline?

[*English*]

Dr. M. V. Ramana: I'm afraid I don't have any information on that. I don't address that. I don't think I have the information to be able to answer that question.

[*Translation*]

Ms. Monique Pauzé: All right.

I would just like to remind you, Mr. Ramana, to send us your brief on small modular reactors, which you submitted to the New Brunswick Minister of Natural Resources and Energy Development. I had a chance to read it yesterday and found some very interesting things in it.

[*English*]

Dr. M. V. Ramana: Thank you very much.

[*Translation*]

Ms. Monique Pauzé: Thank you, Mr. Ramana.

Mr. Whitlock, on the International Atomic Energy Agency website, it explains what the ARTEMIS service is. Can you tell us why this was not implemented in the Chalk River project at Canadian Nuclear Laboratories?

For his part, Mr. Ramzi Jammal, vice-president of the Canadian Nuclear Safety Commission, had committed to it.

[*English*]

The Chair: Answer very briefly, please, in 30 seconds.

Dr. Jeremy Whitlock: I'm sorry. I'm not familiar with that term, the Artemis project. I cannot speak to that.

[*Translation*]

The Chair: Your time is almost up, Ms. Pauzé.

I now give the floor to Ms. Collins.

[*English*]

Ms. Laurel Collins (Victoria, NDP): Thank you, Mr. Chair, and to both of the witnesses.

Dr. Ramana, the world is deeply concerned about nuclear weapons right now, given Putin's war against Ukraine. Canada is standing in solidarity with the people of Ukraine as they stand up to Putin's aggression. It's been extremely troubling to see him threatening the world with the use of nuclear warfare.

You mentioned in your opening remarks the risk of nuclear proliferation. Can you speak a bit more about that danger?

Dr. M. V. Ramana: The main obstacle that any country faces in trying to develop nuclear weapons is acquiring the fissile material that is used to make the bomb. That's the plutonium or highly enriched uranium.

The chemical process, called reprocessing, is used to deal with radioactive waste in some countries. Canada does not do it, though it did in the past, in the 1950s. What it does is separate out the uranium and plutonium from the other radioactive fission products that are produced in a nuclear reactor through the fission reaction that happens there. When it separates, it becomes much easier to take the plutonium away from it. Any process that deals with the spent fuel is typically aiming at reducing the radioactive barrier that prevents people from being able to use it. That is the main connection.

Look at the Cirus reactor that Canada supplied to India. The way that India managed to produce plutonium for its 1974 nuclear weapons test was through this very process in spent fuel from the Cirus reactor.

In the science like the Moltex reactor's, they want to use a fuel that includes plutonium. Therefore, they have to do some kind of reprocessing prior to that.

● (1135)

Ms. Laurel Collins: Thank you so much.

Dr. Ramana, in a 2018 paper on the technical and social problems of nuclear waste, you said that “the nuclear industry does not yet have a working solution for managing spent fuel and high level waste”. You also raised concerns about “the propaganda effort by the nuclear industry to market nuclear power as a solution to climate change”.

Given the industry's interest in the expansion of nuclear energy, are you concerned about the role of NWMO in developing an effective waste management policy?

Dr. M. V. Ramana: Yes. I am indeed concerned about it. I'm concerned about it partly because, to my understanding of how NWMO was set up, it was intended to deal with radioactive waste produced by current reactors. Their consultation process basically was emphasizing the point that this waste has been produced, and the electricity generated by these reactors has already been used, so we have a responsibility to deal with the waste that has been already generated. However, they have pivoted now, trying to say that because we have developed a methodology to try to deal with the current reactors, we can do this for any future reactor, thereby opening the possibility of constructing new reactors.

I think that's a concerning aspect for two reasons. One is for all the technical reasons I mentioned. The way that NWMO has tried to address CANDU reactor waste would not apply exactly as it does to the kind of small modular reactors that are concerned.

The second is because it was compacted, the idea was that the current generation, which has the responsibility to deal with the radioactive waste produced by electricity that was generated earlier, cannot translate into taking responsibility for any future reactors that are being considered. That I see as part of the effort to try to sell small modular reactors as a potential solution to climate change.

I also, as you mentioned, don't think nuclear power can be an effective solution to climate change.

Ms. Laurel Collins: Thank you so much.

On that piece, you recently co-authored a paper about how small modular reactors fail the test of time and cost, and aren't up to meeting the challenge of climate change. Specifically, you talked about the timeline to 2030 and 2035. Industry witnesses have kind of held up small modular reactors as a silver bullet when it comes to Canada's emissions reductions, or as a really important piece.

Can you talk a little bit more about your response to those?

Dr. M. V. Ramana: Yes. We've been hearing about small modular reactors for a long time. In 2001, for example, the U.S. Department of Energy put out a report in which they promised that some reactors were ready for commissioning by the end of the decade. That was 2010. Current estimates are that the earliest small modular reactors in the United States might be commissioned by 2029-30. That's 20 years past that deadline.

This has been the historical pattern. A new reactor design is very easy to conceive of on paper, but not when you try to translate that into a reactor design that can actually be constructed and that can answer all the questions that any good regulator will pose. What is the risk of this reactor having an accident in the event of a fire or in the event of an operator making a mistake or in the event of a flood? Those are very difficult questions.

The Chair: Thank you.

Dr. M. V. Ramana: It takes a long time for any reactor design to be able to develop up to that point, and that's why I don't—

The Chair: Thank you very much. That was a very interesting discussion.

Ms. Laurel Collins: Thank you.

The Chair: We'll go to our second round.

Mr. Seeback, you have five minutes.

● (1140)

Mr. Kyle Seeback: Thank you, Mr. Chair.

Dr. Whitlock, I'm going to ask you a bunch of questions and try to unpack some of the answers we've just heard. I don't have a lot of time, so I'm hoping you can answer succinctly.

It was suggested that there's no plan for the disposal of waste, and there are concerns about the plans of NWMO. That's number one. There seem to be concerns about dealing with waste from SMRs.

Could you comment on both of those things?

Dr. Jeremy Whitlock: There is obviously a plan—the plan that's being implemented that we have been talking about. The plan includes, and always did include, all types of nuclear spent fuel. It's just that CANDU's spent fuel was the prominent one and still is the prominent one to be speaking about.

So it always did include, although SMRs weren't even a gleam in the eye back then, SMR spent fuel. There will be technical challenges that one will have to address before the spent fuel from the SMRs can be put into a geological repository, so I agree with Dr. Ramana on that. I have great faith in the technical ability of our scientists and engineers to do that. There are things you have to do. They will do it.

On the repository itself, the concept of the repository remains the same—all kinds of radioactive material in the earth that Mother Nature has isolated for billions of years.

Mr. Kyle Seeback: With the system we have now, do you think it has proper oversight and that there is insurance that the agencies responsible for waste are independent?

Dr. Jeremy Whitlock: I believe so. I know there have been criticisms because people follow the money and the NWMO is funded by the nuclear industry, so people think there must be a conspiracy theory to cut things short. The NWMO itself functions as an independent body, and it's arm's length and has a very transparent process that started off by talking to Canadians and asking them how they would deal with nuclear waste going forward, including doing what we're doing now and building more and bigger surface storage facilities. The Canadians who attended the meetings spoke strongly in favour of a geological repository, taking into account new technologies that would come along. That was the adaptive phased management approach. We have a long time before the spent fuel from the SMRs is going to have to go into a repository, and all of that time will be spent working on the technology to be able to put it there.

Mr. Kyle Seeback: In your view, would you say in general that the current framework Canada has with regard to managing nuclear waste works well?

Dr. Jeremy Whitlock: In my observations and in talking to Canadians, yes.

Mr. Kyle Seeback: One other comment by Dr. Ramana that I want to ask you about is his saying that none of this factors in the cost of potential accidents. Given your area of expertise, what are the risks of accidents with the storage of nuclear materials?

Dr. Jeremy Whitlock: We have to keep in mind the difference in the types of materials. Yes, the spent fuel from SMRs will be different from CANDU spent fuel, but it's not going to be like the stuff that was in the Waste Isolation Pilot Plant in the U.S. that had the accident, which was weapons processing waste and has a very different composition and treatment. Certainly, they learned some lessons there, but those lessons specifically do not impinge upon the technology for power reactors, including small modular reactors. Yes, there is a technological hurdle that will have to be addressed, we have time to do that, and there will be some costs that will have to be addressed and you always have to address the safety, but I don't think it's something that's unmanageable. It's something we need to include in our tool box. We need to have nuclear power as one of the tools going forward.

Mr. Kyle Seeback: I don't know if you can do this, but would you assess the risk of accidents as very low, low, incredibly low, medium, or high? Is there a scale you could give on this?

Dr. Jeremy Whitlock: If you're talking about accidents to spent nuclear fuel, I would say it's low.

Mr. Kyle Seeback: Okay. Thank you very much.

The Chair: We'll go to Ms. Thompson.

● (1145)

Ms. Joanne Thompson (St. John's East, Lib.): Thank you, Mr. Chair.

Thank you to both witnesses, it's a very complicated topic and I really appreciate both of your perspectives today.

My question is for you, Dr. Whitlock. The Government of Canada's draft of the policy for radioactive waste management and decommissioning was released on February 1, 2022, and the public comment period is open until April 2, 2022. The draft policy specifies the respective responsibilities of the federal government and of the waste producers and owners. It states:

> Waste producers and owners will:
>
> 1.6. ensure optimal protection of human health, safety, security and the environment for present and future generations in their radioactive waste management and decommissioning activities, including transportation....
>
> 1.9. characterize, classify and document their radioactive waste in order to define and implement waste management and decommissioning solutions that are commensurate with their risks in both the short and long term;
>
> 1.10. decommission facilities and sites within an appropriate timeframe to avoid transferring the responsibility to future generations, recognizing that alternative approaches may be justified, subject to approval by the regulator.

Will waste owners be required to document waste according to agreed upon record keeping standards to ensure that future generations have the information needed to safely manage this waste in an accessible format, even as technologies evolve?

Dr. Jeremy Whitlock: Yes, I believe they will be required to do that. As long as there are institutions, there will need to be these institutional controls that are elaborated in that draft policy document.

Again, the question that I was addressing at the outset was what happens when you don't have institutional controls and a mile of ice comes along and erases all of those documents? You need to have something in place for that eventuality. All of the waste policies go out the window at that point, and you're left with Mother Nature.

Ms. Joanne Thompson: Thank you.

On the same note, although the policy respects the polluters-pay principle, does it abdicate the federal government's responsibility to ensure that Canadians and their environment are protected now and in the future from radioactive waste?

Dr. Jeremy Whitlock: No, I don't think it abdicates from that at all. I think the federal government, of course, has the oversight responsibility that would continue, and that's completely compatible with the polluter-pays principle, which is transferred to the rate base. So Canadians pay, and they are the same people behind the government itself. So everybody is responsible for our waste, which is a wonderful concept.

Ms. Joanne Thompson: Thank you.

I'm not sure if you're able to answer this because it relates to Chalk River. At a February 3, 2022 meeting, this committee heard testimony about the reclassification of some mixed intermediate and low-level radioactive waste to low-level radioactive waste at Chalk River. The difference is how readily alpha, beta and gamma radiations are detected, and this was cited as a reason for concern in reclassifying mixed waste.

Could you explain the origins of this concern and discuss its validity?

Dr. Jeremy Whitlock: I'm sorry; no, I cannot speak to that. I haven't worked at Chalk River for five years and I'm not familiar enough with the issue to speak to it.

Ms. Joanne Thompson: Okay, thank you.

The Chair: Is that it, Ms. Thompson?

Ms. Joanne Thompson: Yes.

The Chair: Okay, thanks.

[*Translation*]

Ms. Pauzé, you have the floor for two and a half minutes.

Ms. Monique Pauzé: Thank you, Mr. Chair.

I will continue my questions for Mr. Whitlock.

Earlier, you said that people who were very informed understood all the possibilities in Canada. That could be debated. In my opinion, it depends on the information that is presented to us.

What do you think about the precautionary principle?

[*English*]

Dr. Jeremy Whitlock: The precautionary principle is that if you have any doubt, it's best to err on the side of not doing the activity. I don't agree with that. I think it's a good principle to have, but against that you also have science. Science incorporates the precautionary principle and addresses it with critical thinking, empirical evidence and objectivity. Everything has to be included, because you can't just walk away from this question. We do have to do something with the waste. We do have to do something about climate change, and that involves technologies that generate waste, not just nuclear waste. All of this has to be addressed.

When I mentioned people being informed and then supporting—

● (1150)

[*Translation*]

Ms. Monique Pauzé: Please allow me to interrupt you, Mr. Whitlock, as I only have two and a half minutes.

[*English*]

Dr. Jeremy Whitlock: Okay.

[*Translation*]

Ms. Monique Pauzé: What do you think of the waste burial? Does it comply with the standards of the International Atomic Energy Agency, for which you work?

[*English*]

Dr. Jeremy Whitlock: That's a different type of waste from the nuclear spent fuel that I was talking about. When you're talking about the waste from processes at nuclear facilities, which is low and intermediate waste, then surface storage, high-tech surface storage of modern engineering methods, is a perfectly rational way to deal with that. We deal with all of our waste that's of a danger in that similar way today.

[*Translation*]

Ms. Monique Pauzé: In fact, the burial does not comply with International Atomic Energy Agency standards.

I'd like to talk to you about the Chalk River plant, since you worked there, from what I've read. The Chalk River site is classified as a high probability fracture zone. In other words, the site is located within a seismic zone.

Is it normal to choose the Chalk River site for a near-surface waste management facility?

[*English*]

The Chair: Answer very quickly, please.

Dr. Jeremy Whitlock: The people who have been doing the assessment of the location of this and the science and the technology that are going to be put into place have taken that into account. Yes, you have seismic activity that you have to address and chemical characterization of the soil and everything else, and these are taken into account. These people are very smart and have done their homework. They have analyzed the situation.

The Chair: Thank you.

Ms. Collins, you have two and a half minutes.

Ms. Laurel Collins: Thank you, Mr. Chair.

I'll start with Mr. Whitlock. You have spoken about the need for rational, informed conversations and listening to people's concerns, and you had mentioned that you think the NWMO has been doing this well. We heard in one of our previous committee meetings that there are some serious concerns about the NWMO's engagement process with indigenous communities. The Grand Council Chief of the Anishinabek Nation told us that an NWMO panellist told his community that, “We could explain it to you, but you wouldn't understand it anyway.”

Hearing these concerns, are you satisfied that the consultations led by the NWMO are engaging and respectful conversations with indigenous peoples and truly listening to their concerns?

Dr. Jeremy Whitlock: In my personal experience, travelling with the NWMO on some occasions as a guest speaker and speaking to indigenous communities in local town hall meetings of the towns that were in contention, back when there were many more than two, my comment that it was a good process was from the observations of that, plus their three-year listening process, which was painful from the point of view of not being able to provide counterarguments to what I was hearing. Then I realized that it was brilliant. They have listened for three years and written down and addressed the needs of the people they were visiting across Canada, and then going into the communities and speaking to the indigenous communities.

When there's time for respectful, rational discussion—I don't mean addressing the demonstrators out in front of the building, but I mean inside in the quiet room—looking at diagrams and asking what scares you about this aspect, what scares your family, and then answering—

Ms. Laurel Collins: I only have two and a half minutes.

It sounds like you're not concerned, which is a little troubling given that we're hearing from indigenous leaders who have taken part in these processes that they are concerned.

I'll just quickly return to Mr. Ramana. We heard recommendations from a number of previous witnesses that we need to address the risks of conflict of interest and a recommendation for the Canadian Nuclear Safety Commission.

They report to the Minister of Natural Resources; the minister is responsible for overseeing, but also promoting, nuclear energy. Do you think it would make more sense for the CNSC to report to the Minister of the Environment to mitigate risks of conflict of interest?

The Chair: Give a 10-second answer, please, or even less if you can.

Dr. M. V. Ramana: Yes.

The Chair: The answer is yes? Thank you, Dr. Ramana, for accommodating our time limit.

Mr. Carrie, you have five minutes, please.

Mr. Colin Carrie (Oshawa, CPC): Thank you very much, Mr. Chair.

First of all, I'm really pleased to be part of this committee. It's good to see everyone.

Dr. Whitlock, I'm the member of Parliament for Oshawa, and basically I live between Darlington and Pickering, two well-known nuclear facilities. I must say that most of the people in my community are pretty comfortable with the situation. We live there, we work there, we have neighbours who work in these facilities, we have kids who go to school and become nuclear engineers and we see the economic benefits of it. I think one of the most important reasons for that is the industry overall has done a very good job with us locally, educating people on nuclear and what it's all about.

One of the questions I have for you is, though, moving forward and looking at places to actually store this long-term. Many Canadians are happy when these are government facilities, but moving forward, I think some of the storage facilities may be privately run. I wonder if you have a comment on risk-benefits for people who live in communities where storage facilities will be.

As far as transparency and access to information is concerned, do you think everything is manageable so the industry can get the information out and people such as those in my community who have a lot of questions can get those answers?

● (1155)

Dr. Jeremy Whitlock: For sure, there has to be rigorous oversight by the federal government and by the regulator, and that will always be the case regardless of the operator. I know there's a perception that if the government is involved, perhaps everything is being taken care of. There are probably a lot of perceptions the opposite of that as well. The common denominator is that there is a strong regulator, and that has to be demonstrated. If it's not perceived to be strong, that has to be addressed as well.

Information needs to be made and time needs to be given to all points of view in addressing credibly all of the questions that arise.

Mr. Colin Carrie: In my community, we live close to these facilities and, like I said, we're very comfortable.

I wanted to ask you for a comment. Early on, I think Dr. Ramana was saying that to meet our climate change objectives not only here in Canada, but also globally, we have to have a mix. In Ontario, nuclear seems to have performed quite well.

Do you see any way to net zero if we do not utilize nuclear energy?

Dr. Jeremy Whitlock: We need all tools in the chest. SMRs are the way that we can sell nuclear power to a new generation, but we can also build CANDU reactors. Those are on the shelf. We can build those, as well, and your witnesses in the next session can answer to that.

Nuclear is necessary, as well as renewables. Everything has to be contributing together in the way that Ontario has done it to have an almost 100% clean grid. That's the way going forward. Renewables will need something to fill the gap, because they can't be running all the time. That's going to be fossil fuels, if you can't run something else that's clean, like hydro or nuclear. This speaks to diversity.

I absolutely cannot see a way, globally speaking, especially with the emerging countries that are increasing their economies.... They're going to make all the same mistakes we did if we don't provide them with these cleaner solutions. I can't see how nuclear can be overlooked.

Mr. Colin Carrie: You made a comment about the waste from small modular reactors. Right now, that doesn't seem to be part of the urgent requirement for storage, and you mentioned that we could be building more CANDU-type designs in which we do know the fuel. We know what it's about.

My colleague asked a bit about accident risk, and you mentioned that Mother Nature has been looking after some radioactive things for millennia. I'm curious. With the type of waste that we have now, if it is being stored properly, you mentioned that it would be a low risk.

Do you see any other challenges utilizing and storing the waste that we have? I'm thinking more or less transportation-wise. Is this something that people in communities need to know a bit more about?

Dr. Jeremy Whitlock: They definitely need to know about the transportation, because it's going to be going through their communities all along the path.

When people think of transportation, they think about accidents, so that needs to be explained to them. There's nothing like seeing the tests that they put these transport vehicles and containers through to show.... These are things—immersion in water and fire—that they need to see and not just be told. They need to see the pictures.

● (1200)

The Chair: Thank you very much.

Go ahead, Mr. Weiler.

Mr. Patrick Weiler (West Vancouver—Sunshine Coast—Sea to Sky Country, Lib.): Thank you, Mr. Chair.

I also want to thank Dr. Ramana and Dr. Whitlock for joining our committee today.

I want to start with Dr. Ramana. I really appreciate your earlier comments, but one thing that was not mentioned was how pyroprocessing concepts can address proliferation risks. My understanding is that the way this risk is reduced is as a result of how pyroprocessing laces the plutonium with uranium and actinides to make both stealing plutonium and creating weapons more difficult.

This approach reduces the risk by eliminating the need to transport used fuel from and new fuel to the fast reactors at the site. Do you agree that this would mean that pyroprocessing has a lower nuclear proliferation risk compared to Purex, because of the non-availability of pure plutonium product?

Dr. M. V. Ramana: The issue is not that the pyroprocessing has a bit of contamination of the plutonium. The issue is that most of the fission products are being removed from that, so you are making the task of proliferation much easier, compared to leaving the plutonium in the spent fuel as such, which Canada has been doing so far. The approach that NWMO has taken is that the spent fuel will be as is, placed in casks and inside the geological depository. That's a far better way to address the proliferation risk.

You're trying to compare a really bad process, which is a Purex process, with a bad process, which is pyroprocessing.

Mr. Patrick Weiler: Thank you.

My next question is for Dr. Whitlock. You mentioned that you'd like to see other chemicals treated like nuclear waste at ground storage. We talked about how the benefits are going to be seen for future generations.

Why would we invest right now in geologic storage, given the need to make major investments in decarbonizing all other energy sources in Canada right today?

Dr. Jeremy Whitlock: The need is because Canadians have recognized that we have to be doing something about our waste right now with this generation and the next generation, so that 15 generations from now they are not having to deal with our waste.

That's the need. It's a moral obligation. Technically the waste is fine where it is right now. It can be there for hundreds of years, but then it's going to be bowled over by a glacier and spread around the continent. Along with everything else in downtown Toronto, it is going to be spread around the continent, so we need to do something about it.

The only thing we are currently doing something about on that timescale is nuclear waste, and that's because we can quantify it, it's all in one place, it's relatively small, the problem is well defined, and it scares the heck out of people. This is something you have to do to be able to advance the technology itself, in order to have that tool in the chest for climate change. So that's the need.

Mr. Patrick Weiler: Thank you. I was hoping you could comment on how nuclear waste is governed in Canada as compared with other countries around the world.

Dr. Jeremy Whitlock: It's very similar. I can't comment in detail. I'm not an expert on the different waste policies around the world, sorry.

Mr. Patrick Weiler: One of the things you mentioned in your comments is the need for nuclear energy as a stable baseload source of power as opposed to solar and wind, which are intermittent. I'm wondering what role you think storage can play with those types of intermittent sources of energy, to really contrast and to combat that issue of intermittency.

Dr. Jeremy Whitlock: Storage is definitely a technology, but if you're talking about something ready in the quiver to help us with getting to net zero in the near future, storage technology on the scale we are talking about, which is providing energy to a country-sized population—not just a First World country but all the countries on the planet that are trying to get to the same level of health and prosperity that Canada has been used to—that's an awful lot of stuff. It can't just be this or that, and you can't just throw one technology off the table because you happen to think it's going to take 30 years to get economies of scale down to where it's practical.

Unless there is a moral reason not to be doing it, if it's something that's technically solvable then we need to keep all the tools in the chest.

The Chair: You have 10 seconds.

Mr. Patrick Weiler: I'll just end it there.

● (1205)

The Chair: Thanks.

[*Translation*]

This is now the end of the discussion with our first group of guests. I would like to thank the witnesses for bringing their expertise and for contributing to our discussion, which has been extremely interesting.

We will pause to give the next panel an opportunity to join the meeting. That should take about five minutes. We will then hear presentations from the witnesses, which will be followed by a question and answer period.

I again thank the witnesses for contributing to our study and wish them a good day.

● (1205)

_____(Pause)_____

● (1210)

[*English*]

The Chair: We'll get going. Based on my calculation, we'll need an extra 10 minutes after one o'clock, so this portion will go to 1:10. I assume there's no objection to that. That allows everyone to get in their questions according to the time limits.

We'll start with the three-minute opening statements.

I'd like to welcome our witnesses. We'll start with Atomic Energy of Canada.

I don't know who will be presenting for the three minutes. Is it Mr. Dermarkar or Mr. MacDonald?

Mr. Fred Dermarkar (President and Chief Executive Officer, Atomic Energy of Canada Limited): It will be me, Fred Dermarkar, the president and CEO of AECL, who will be presenting.

The Chair: I'm so sorry. Yes, of course, Mr. Dermarkar. I'm very sorry. I didn't clue in there.

Go ahead, please.

Mr. Fred Dermarkar: Thank you, Mr. Chair.

Good afternoon, everyone.

[*Translation*]

It is a pleasure to be here today to discuss Atomic Energy of Canada Limited, or AECL, and our role in responsible environmental stewardship.

[*English*]

I would like to start by acknowledging our commitment to healing and reconciliation with indigenous peoples. In Ottawa, where I am located today, I acknowledge that the land I stand on is the traditional land and unceded territory of the Algonquin Anishinabe people.

[*Translation*]

I will be brief and focus on two key points. First, I will discuss AECL's role in radioactive waste management in Canada. Second, I will discuss what we are doing to protect the environment and manage our radioactive waste.

[*English*]

AECL is a federal Crown corporation, and we receive funding from the government to deliver on our mandate, which includes driving nuclear innovation for Canada and cleaning up federal nuclear legacy waste. We deliver this mandate through a government-owned contractor-operated, or GOCO, model.

Simply put, our contractor, Canadian Nuclear Laboratories, manages and operates our sites across Canada on our behalf. AECL provides direction to CNL and exercises oversight to ensure Canada derives value from the GOCO. AECL continues to own the sites, assets and liabilities. This is a model that has been used elsewhere in the world, and we have drawn from international best practices and lessons learned in putting it together here in Canada.

Over the past 70 years, AECL's work has had a profound impact on the lives of Canadians, whether it is the way we power our homes, with 15% of Canada's electricity coming from nuclear power, or the way we fight cancer. The medical isotopes produced at Chalk River, which are used to diagnose and treat cancer and other diseases, have benefited millions of Canadians and people around the world.

[*Translation*]

However, like any human activity, this creates by-products and waste. In this regard, AECL is responsible for radioactive waste resulting from scientific and medical isotope production activities. All our waste is safely stored and we are investigating long-term disposal solutions.

[*English*]

To respect our time limits today, I want to stress that one of AECL's roles is to represent the interests of the Government of Canada in the management of its radioactive waste and environmental liabilities.

As we look to the next generation of research on energy and health, the Chalk River labs are poised to be at the forefront of our science future, but we need to take action now to protect and care for the environment and address our legacy liabilities.

● (1215)

[*Translation*]

We are fully committed to working with the Canadian public and indigenous peoples in an open and collaborative manner to achieve this.

Thank you.*Merci.Meegwetch.*

The Chair: Thank you, Mr. Dermarkar.

I will now turn the floor over for three minutes to Mr. McBrearty, president and CEO of Canadian Nuclear Laboratories.

[*English*]

Mr. Joseph McBrearty (President and Chief Executive Officer, Canadian Nuclear Laboratories): Thank you, Mr. Chair.

Good afternoon, and thank you for the opportunity to be here today.

My name is Joe McBrearty. I'm the president and CEO of Canadian Nuclear Laboratories. Joining me today is Ms. Meggan Vickerd, our general manager of waste services.

My remarks today will address the committee's study on nuclear waste management practices. I am quite proud of the work that we do in this area.

To begin, I believe it is important to understand the origins of the waste we are discussing.

For over 70 years, CNL and AECL have been conducting groundbreaking research at the Chalk River laboratories. This research has contributed to two Nobel Prizes and has spurred economic and technical development at home and around the world, including the invention of the CANDU reactor, which provides nearly 60% of Ontario's electricity. In addition, medical isotopes produced in Chalk River have been used in over one billion procedures to detect and treat life-threatening diseases, including cancer.

While our history has brought immense success to Canada, it has also created nuclear waste that must be cleaned up, including contaminated soil, legacy waste management areas and old buildings. While these materials are being safely managed today, permanent solutions are absolutely necessary.

In 2015 CNL began the cleanup of the Chalk River site, including nearly 200 structures, to reduce the risk at our campus. This, and other related work, includes the repatriation of 35 tonnes of high- and low-enriched uranium assets back to the United States, their country of origin; their reuse of legacy material for exciting applications for the future; and the drastic reduction of radiological and hazardous material source terms.

Today I am very proud to say that 110 structures have now been safely remediated, work which is subject to rigorous planning to minimize material that is sent for final disposal.

Most of this material is known as “low-level radioactive waste”. CNL has proposed a near surface disposal facility as the best approach to isolate and contain these materials, to reduce risk and to protect the surrounding environment.

Intermediate-level waste will undergo processing to reduce volumes before it is safely stored for the long term at a new, modern facility until a national determination has been made on its disposition.

As for high-level waste, we plan to transport nearly all of this material off-site to the Nuclear Waste Management Organization's deep geologic repository for final disposition.

Cleaning up this waste allows us to position the campus for the future: to restore our lands to their proper state; to improve accessibility to the site; and to ensure the safety of the environment, our workforce and the public. We expect that all this waste will be safely addressed by the year 2070. That may sound like a long time, but this is painstaking work that follows strict regulatory requirements.

Looking to the future, CNL is advancing new clean energy technologies, including small modular reactors and hydrogen, and pursuing another life-saving isotope, known as “actinium-225”. This is promising research for CNL and our nation, and this is enabled by our nuclear facilities and modern waste management practices.

Thank you, once again, for the opportunity to be here.

Ms. Vickerd and I would now be happy to answer any of your questions.

[*Translation*]

The Chair: Thank you, Mr. McBrearty.

We will now turn to Mr. Patrice Desbiens, deputy director of Hydro-Québec's Gentilly-2 facilities.

You have three minutes.

Mr. Patrice Desbiens (Deputy Director, Gentilly-2 Facilities, Hydro-Québec): Thank you.

Good afternoon, Mr. Chair, members of the committee. I am Patrice Desbiens, deputy director of the Gentilly-2 facilities at Hydro-Québec.

I am pleased to join you today, and I would like to thank you for inviting us to discuss nuclear waste management at our facility. Before getting started, I would like to give you some background.

Hydro-Québec operated the Gentilly-2 nuclear facility safely and reliably from 1983 to 2012. Since it was permanently shut down on December 28, 2012, we have been proceeding with decommissioning the Gentilly-2 facilities, which will be fully dismantled around 2062.

Already, the first two phases of our decommissioning plan have been completed. The first phase of the decommissioning was stabilization. During this phase, the reactor was shut down, the fuel was removed from the reactor, and systems containing heavy water were drained, dried and put in a layup state. The spent fuel had to be stored for seven years in a pool before being transferred to dry storage units. This step was successfully completed in December 2020.

We are currently carrying out activities for the storage-with-surveillance phase. The key remaining activities are the radiological, environmental and physical monitoring of the site where our radioactive waste is stored.

Radioactive waste management is central to Gentilly-2's decommissioning activities. That is what I would like to talk about today, since it is of particular interest to members of the committee.

After considering the various decommissioning strategies, Hydro-Québec selected a deferred decommissioning approach. That means we will proceed with the final dismantling of the nuclear facility after a storage-with-surveillance period of about 35 years. A number of points were analyzed and various considerations led to this choice, and radioactive waste management was a key factor in making the decision.

This scenario is based on the availability in 2048 of a permanent site for spent fuel disposal under the purview of the Nuclear Waste Management Organization.

A more rapid decommissioning would involve storing and monitoring the radioactive waste from the dismantling until a long-term storage facility was available, which involves additional costs.

It is also worth noting that decommissioning over a 40-year period means the radioactive material has more time to decay, which simplifies the protective measures required to ensure workers' health and safety.

Until this site is available, we are continuing to monitor and maintain the strictest physical security at the Gentilly-2 facilities. We are also continuing our efforts to reduce the volume of nuclear waste currently stored on site to ensure its sustainability and optimize its future transfer to the permanent storage facility.

We, like others responsible for Canadian nuclear facilities, are aware of the great responsibilities we have toward generations today and in the future, and we take these responsibilities very seriously.

That brings me to the end of my opening remarks.

Thank you for your attention. I would be happy to answer your questions.

● (1220)

The Chair: Thank you, Mr. Desbiens.

We'll start the first round.

Mr. Mazier, you have the floor for six minutes.

[*English*]

Mr. Dan Mazier (Dauphin—Swan River—Neepawa, CPC): Thank you, Chair.

I am new to this committee and I am learning about nuclear. I am always so impressed with how proactive the nuclear industry is and how they're really concerned about our future and future generations. Thank you for that.

Mr. McBrearty, is the legacy waste located at Chalk River safer by being stored in the near surface disposal facility or above ground as it is now? May I have just a short answer?

Mr. Joseph McBrearty: It is much safer stored in the near surface disposal facility versus above ground.

I would just add that a large percentage of our waste exists today and it is not contained. It is not isolated. It is open to the elements.

Mr. Dan Mazier: Again, going back to being proactive, you want to do better, so that's great.

There has been some concern about the NSDF at Chalk River being located close to a river. Why do you think this is? Should Canadians be concerned?

Mr. Joseph McBrearty: Thank you, sir, for the questions.

Folks are generally concerned because they look at the geographic separation between the proposed site of the NSDF and the Ottawa River. However, we selected the NSDF site after a fairly rigorous process to determine the best site on our campus. It is the best site to protect the Ottawa River. We looked at it from a geological standpoint and we looked at it also from a hydrogeological standpoint to ensure that the Ottawa River watershed is protected at all costs.

Mr. Dan Mazier: Excellent.

Are you seeing any delay tactics in the approval of nuclear waste storage facilities by those who are anti-nuclear energy, despite the science on its safety and its potential?

Mr. Joseph McBrearty: It's always a controversial topic. Folks are very impassioned by nuclear power and nuclear waste disposal to begin with, and today we actually have, I think, a very robust, very rigorous process that allows the public to express their concerns that either we or our regulator, the CNSC, can address.

It can be a long process, but I would tell you from this point we actually believe that process has borne some very good results and resulted in some changes for us as we have finalized the design of this facility.

● (1225)

Mr. Dan Mazier: Have you seen any delay tactics that are concerning that you think might be doing more harm than letting the process play through?

Mr. Joseph McBrearty: There is a statutory process that exists in Canada, operated by our regulator, the CNSC. This project in particular is under a thing called CEAA 2012. Our environmental assessment and environmental impact statement that was generated for this project started under that legislation and it has proceeded that way.

There are many questions, but I think we have been able to successfully answer all of the regulator's questions.

Mr. Dan Mazier: How important are public-private partnerships in nuclear waste management, GOCO, or government-owned contractor-operated, models in Canada, and how dynamic?

Both of you can comment on that if you want.

Mr. Joseph McBrearty: Thanks. I'll start and then turn it over to Mr. Dermarkar for his view.

The GOCO, or the government-owned contractor-operated, contract offers one of the best potential contracting mechanisms that Canada can employ. There is not very much decommissioning in nuclear waste management experience that exists in Canada today. The vast majority of that experience exists in the United States and the United Kingdom. The ability to bring in high-quality engineering firms, to actually bring that talent to Canada and have it rapidly and expeditiously available, is a significant benefit and allows Canada to be at the same level as the other major nuclear tier-one nations.

I would turn it over to Mr. Dermarkar for any further comments.

Mr. Fred Dermarkar: Thank you, Mr. McBrearty; and thank you, Mr. Mazier, for the question.

I agree with what Mr. McBrearty said. One of the most powerful elements of the GOCO model is the access it gives us to international experience when we need it. It's not just about the management team, who are drawn internationally, but it's also about being able to draw upon a very large pool of experts for specific projects or specific issues that arise.

The one thing I would add is that having AECL as a separate oversight organization provides yet another layer of oversight above and beyond the boards of directors of CNL and AECL. That additional layer of oversight adds value as well to the process. Altogether, I believe that Canada is benefiting tremendously from having a GOCO and we are seeing it in the results that have been achieved over the last six years.

The Chair: Thank you.

We'll go to Mr. Duguid now, for six minutes.

Mr. Terry Duguid: Thank you, Mr. Chair.

I welcome our new members to the committee, and particularly Mr. Carrie, who as you know is our neighbour on the 4th floor of the Justice Building. Perhaps we can have a few huddles every now and then to do some pre-committee business. That's just to point out, as you have, that this committee has a history of working together.

Mr. Colin Carrie: Okay, as long as Francis brings the coffee.

Mr. Terry Duguid: Today, he has.

Mr. Chair, I have a question also about the intermediate storage issue and the site that has been talked about near Chalk River. My Manitoba colleague also referenced this issue. It is near a river.

Yesterday, the Intergovernmental Panel on Climate Change released their report with a major emphasis on climate change adaptation. We are going to see floods and drought. I wonder if, in consideration of that intermediate storage, we have considered the factors contained in the IPCC report.

As one of our speakers mentioned, there still is this perception problem, and I wonder if they took that into account in making a decision on the site.

● (1230)

Mr. Joseph McBrearty: That's a very pertinent question, and one of the founding principles that we embarked on was to ensure that man-made or natural events would have no impact on this particular storage facility.

There are a couple of things that I do want to clarify. When you use the term “intermediate”, there can be several different connotations of that. Intermediate in the nuclear world, in the waste world, means something a bit different. It's a bit higher classification of waste than what we are proposing to go into this near-surface disposal facility. Intermediate-level waste does not go into this facility. The near-surface disposal facility is a disposal facility for low-level waste.

We considered all possible climate change and major weather events. We looked at back-to-back, hundred-year floods. The facility itself is about 50 metres above the Ottawa River as it is today, and it's about 40 metres above the highest expected flood plain. We analyzed not only for climate change events but also dam failures. We are on a water system that is dammed, so we looked at potential dam failures upstream of the facility, and there was no impact. As a matter of fact, the base of the facility was significantly above the highest water level hypothesized.

Mr. Terry Duguid: Mr. Chair, I think we have time for my last question.

I mentioned to this committee that while I'm intrigued with small modular reactors, I remain agnostic about them and I believe that all technologies we use in combatting climate change have to compete on cost and on safety.

I wonder if either speaker in this section of our deliberations this morning heard the previous speaker, Dr. Ramana, and his concerns about dealing with waste from small modular reactors. I'm hearing competing views, and I'm trying to sort out the science. I wonder if there has been a major look at small modular reactors from the view of their potential to reduce emissions as well as their safety as a relatively new technology.

Science, I learned in university, is a contact sport. You can see science very differently depending on the value base that you have.

Is it time for a major review on small modular reactors to answer some of the questions that are in the public realm?

Mr. Joseph McBrearty: I will turn that initially over to Mr. Dermarkar to give a view from AECL, and then, if you have any further questions, I will certainly follow up with you.

Mr. Fred Dermarkar: Our view at AECL is that nuclear is part of the solution to climate change, and there are three pathways to nuclear.

One is the refurbishment that you see going on right now in Ontario, which will ensure that existing reactors continue to operate for a few decades more into the future and provide clean energy. The second is SMRs, and the third is our own technology, the CANDU technology, looking at modernizing and refreshing it and making it available as an option.

With respect to SMRs, it is really important that we demonstrate their effectiveness. There is a lot of talk about what SMRs might do, but really the proof is in the pudding, and that comes with demonstration.

The Chair: That's a good point to end on. We can always take up the discussion with other questioners, but we're over time. I'm sorry to cut you off, Mr. Dermarkar. It's unfortunate that I have to do that.

We'll go to Madame Pauzé, and I'm sure there will be opportunities to continue with your line of thinking.

[*Translation*]

Ms. Pauzé, you have the floor.

Ms. Monique Pauzé: Thank you, Mr. Chair.

I am particularly interested in Chalk River. I think Ms. Vickerd could answer my question.

Will you redo the ambient radioactivity calculations at the Chalk River site? Will you commit to redoing that inventory if there are errors?

● (1235)

[*English*]

Ms. Meggan Vickerd (General Manager, Waste Services, Canadian Nuclear Laboratories): The baseline ambient radioactivity is presented in our environmental impact statement. We have calculated the ambient radioactivity that the proposed near surface disposal facility would represent. Because it is only low-level waste that's going to the facility, there's no incremental increase or hazard that the public or workers would be exposed to.

[*Translation*]

Ms. Monique Pauzé: Thank you for your reply.

Let's talk about low-level radioactive waste. In 2019, Canadian Nuclear Laboratories told the Canadian Nuclear Safety Commission that there were plans to place intermediate-level radioactive waste in above-ground mounds. However, these statements are not transcribed in the latest CMD. It still refers only to low-level radioactive waste at Chalk River.

Finally, will it be low-level radioactive waste only or will it be mixed with intermediate-level radioactive waste?

[*English*]

Ms. Meggan Vickerd: It's a very small amount of intermediate-level waste, and that's where the environmental assessment process worked quite well. We heard from the public that they had concerns with it, so we revised our project to include only low levels. It is only low-level waste that will go into the near surface disposal facility. That's a great example of how the environmental assessment process works for the public to have input.

[*Translation*]

Ms. Monique Pauzé: Thank you.

I'll explain my interest in Chalk River. First, my drinking water comes from the St. Lawrence River, as the Ottawa River flows into our area. We also know that Chalk River is in a seismic zone in western Quebec. We also know that the slope criterion was changed from 10% to 25% to make the site eligible. We also know that it flows into the creek. Mr. Mazier asked a question about this earlier. The International Atomic Energy Agency says it has to be very far from drinking water sources, rather than near them.

Given all this, what is still motivating Canadian Nuclear Laboratories to continue to advocate the Chalk River site for near-surface waste management facilities?

[*English*]

Ms. Meggan Vickerd: I assume that's still directed at me, so I'll start by saying that we all have an underlying interest in protecting water resources. In fact, I live directly across from the Chalk River site. I drink well water directly in the vicinity of the facility. I believe in the proposed NSDF as an additional safeguard to protect our key water sources.

CNL's proposal for near surface disposal follows international guidance and standards. We have demonstrated that with concordance tables in our documents that are available to the public on our projects website. We've had direct webinars on the topic of how we meet international guidance and, more importantly, of how we meet the Canadian framework and the requirements in Canada for proposing a disposal facility.

[*Translation*]

Ms. Monique Pauzé: I keep coming back to Chalk River, because I'd rather be proactive than become radioactive one day.

In October 2015, two months after the contract was signed, Canadian Nuclear Laboratories notified the Canadian Nuclear Safety Commission of its intention to build a disposal facility. After that, things happened very quickly. Six months later, in 2016, a regulatory application was made to amend the licence. A year later, in 2017, Canadian Nuclear Laboratories submitted their licence application.

Was Canadian Nuclear Laboratories able to obtain enough information to properly assess the project? There are a lot of gaps that have been raised by experts, so I'm wondering about how fast things unfolded in a project like this.

Who or what will this project really benefit? Is it the citizens, the environment, future generations, the public purse?

● (1240)

[*English*]

Ms. Meggan Vickerd: I'll assume that the question is directed at me. Perhaps after I start answering, Mr. Dermarkar might want to answer from AECL's perspective.

It's in the interest of everyone that we do something immediately, now, with the waste. The waste is here, as you heard from Mr. McBrearty's commentary. Some of the waste was placed in the forties and fifties. It's uncontained. It's exposed to the environment. We are being very proactive in identifying that we want to put it in a better condition in an engineered containment facility.

As far as the process goes, we are following CEAA 2012, and we are following the Canadian Nuclear Safety and Control Act. These are very good, well-defined legislative processes.

We started our draft EIS, or environmental impact statement, in 2016, with lots of engagement from the public and indigenous first nations. Only six years later, last summer, was the environmental impact statement accepted by CNSC staff. Now we're going through a very rigorous process at the commission hearing, which is another formal avenue for the public and indigenous first nations to be involved in.

There are a number of processes at play here that—

[*Translation*]

Ms. Monique Pauzé: Thank you, Ms. Vickerd. I have to interrupt you here, because I would like to take the time to ask you to give the clerk a written answer to the following two questions, if the chair agrees.

The Chair: Yes, go ahead.

Ms. Monique Pauzé: What income do Canadian Nuclear Laboratories receive for storing the cobalt-60 sources that are imported?

How much cobalt-60 repatriated from abroad is in Canada and where will this waste be stored?

Thank you.

The Chair: That's noted, thank you.

[*English*]

Madam Collins.

Ms. Laurel Collins: Thank you, Mr. Chair.

It has been mentioned that AECL uses the government-owned contractor-operated model, the GOCO model, so AECL owns the facilities and has the responsibility for environmental remediation and radioactive waste management, and CNL is responsible for the day-to-day operations. CNL is run by a private sector consortium of which SNC-Lavalin is the majority shareholder.

My question is really around what differences exist in public access to information for information managed by CNL versus that managed by AECL. Is CNL subject to the provisions of the Access to Information Act?

Mr. Joseph McBrearty: Thanks for that question. Mr. Dermarkar may want to provide a few more pieces of opinion on this, but we are subject to what I would call "freedom of information" acts. That's the term I'm used to since I'm from the United States—but yes.

Mr. Fred Dermarkar: AECL is subject to ATIP. Was that the question?

AECL does publish information on its website that discusses the activities undertaken by AECL through CNL.

Ms. Laurel Collins: So AECL is subject to the provisions but CNL is not? Is that correct?

Mr. Fred Dermarkar: My understanding was that CNL was not subject to the provisions of ATIP.

We've given you conflicting answers. I would like to verify that. If we can come back to it, between Mr. McBrearty and me, we will verify that with regard to CNL.

Ms. Laurel Collins: If you folks could send us some information afterwards in writing, that would be really great.

The Canadian Nuclear Safety Commission is conducting the environmental assessment of the near surface disposal facility at Chalk River. We've heard a little bit about it, but it started under a different assessment.

If the environmental assessment for Chalk River were to start today, the Impact Assessment Agency—not the CNSC—would conduce the assessment. It seems to me there would be more public confidence in the proposed disposal site if it were under this Impact Assessment Agency assessment. Is there a reason why you haven't asked for that?

Mr. Joseph McBrearty: I think we probably just need to make a few things clear. The Impact Assessment Act allowed for projects that were already under way under CEAA 2012 to continue under that act.

Some of the key differences between the Impact Assessment Act and CEAA 2012 were the engagements with indigenous nations and communities. We have conducted significant and extensive engagement ever since the project was started back in 2016, and we continue to do so today with significant engagement with indigenous communities.

I think it's really important to try to discuss this in a bit more detail because not only did we start and reach out from the very beginning, but it has also been an evolving process in which both sides have learned to listen and understand their needs.

We have actually gone through several changes in our approach to this project because we have heard from indigenous communities. We have had hundreds of interactions with local indigenous communities in the Chalk River area or an area that would be impacted.

● (1245)

Ms. Laurel Collins: Thanks so much.

If the project were approved, what ongoing environmental monitoring, such as the monitoring of concentrations of radioactive elements in surface water and ground water would be required of the CNL, the Canadian Nuclear Laboratories? Would that data be made available to the public in a timely manner?

Mr. Joseph McBrearty: As part of our commitments and environmental assessment, we drew up a large number of actions we committed to, which are part of what we call our "environmental assessment follow-up monitoring plan". That will take into account not only environment monitoring, but also areas such as forest management, noise reduction, species at risk and potential cultural impacts.

Let me go back for a second, because I think it's important that this has been an ongoing and evolving conversation with all the local indigenous people to understand what their real concerns are.

Ms. Laurel Collins: I only have a very short amount of time left.

Mr. Dermarkar, I see that your hand is up.

The Chair: Go ahead very briefly, please.

Mr. Fred Dermarkar: Thank you.

I want to respond to the question on ATIP.

I have confirmed that CNL is not subject to ATIP. However, all of CNL's documents are AECL's documents. AECL is subject to ATIP. In that regard, Mr. McBrearty is vicariously subject to ATIP.

The Chair: Thank you for that clarification. We appreciate it.

We'll now go to the second round, starting with Mr. Carrie.

You have five minutes.

Mr. Colin Carrie: Thank you, Mr. Chair. I appreciate that.

I want to follow up on my colleague's question about the Canadian Nuclear Safety Commission. My understanding is that it reports to the natural resources minister. I believe one of the points she brought up, which is fair, is whether people would have more confidence if it reported to the environment minister.

In your opinion, should the Canadian Nuclear Safety Commission report to the environment minister instead of the natural resources minister? Do you think that would be more efficient or more effective, Mr. McBrearty?

Mr. Joseph McBrearty: I would say that the structures within government are the prerogative of government. As a private contractor, we should not opine on that area. That is something I believe internal government policy is best used to address.

Mr. Colin Carrie: Mr. Dermarkar, do you have an opinion on that, or is it basically the same idea?

Mr. Fred Dermarkar: It's a similar idea. We are part of government, but we do not set government policy. We implement government policy. If the government chooses to be organized in a certain way, that's the prerogative of government. AECL does not have an opinion on that.

Mr. Colin Carrie: That's a great political answer. Thank you for that.

I want to get back to the importance of the work you're doing. As I mentioned to the previous panel, being in Oshawa, I'm surrounded by nuclear plants. I have Clarington on one side and Pickering on the other. It's an important part of our community and economy, but we do need to look at some long-term storage.

I asked the previous panel this question and I would like to get your opinion on it. Maybe you can start off, Mr. Dermarkar. Is there any way to net zero if we don't have nuclear?

● (1250)

Mr. Fred Dermarkar: Our minister, Minister O'Regan, was very clear on this: there is no pathway to net zero without nuclear. I attended a talk by Mr. Carney at the end of October at a U.K. summit, and he repeated that. You might know that he is a special envoy for the UN looking at how to achieve a framework for managing climate change. Mr. Carney himself said that there is not a pathway to net zero without nuclear.

That's a personal view, but I'm sharing with you what others have said in that regard. I think it's a well-supported position. In January, the IEA—the International Energy Agency—wrote a country report on Canada. They reinforced in that report the importance of pursuing nuclear and, in fact, encouraged Canada to help the rest of the world pursue nuclear through both SMRs and CANDU technology, because they see Canada as a tier-one nuclear nation.

Reading all these documents, it's hard to argue that nuclear is not part of the solution to net zero.

Mr. Colin Carrie: Thank you very much for that opinion.

I, as well, think that Canada has a great opportunity to take a leadership role in the full cycle of nuclear, whether that's mining or long-term storage. We did hear from a previous witness that the concern and moral obligation for Canada, because we do have this waste now, is that we should be working to come up with a permanent solution. He mentioned that it might not be happening tomorrow, but eventually we're going to have some glaciers pop over again and, really, if we don't address it now, we won't have a solution for generations to come.

My question would be this. Do you see any danger or risk for accidents or anything like that, given that we don't have these small modular reactors yet with their waste products? With the waste products that we are managing now, do you see a very high level of risk with the storage that is being proposed now for our nuclear waste?

Mr. Fred Dermarkar: What I see, first of all, is that the waste we have right now poses a low risk to the environment. When we have that waste in a properly engineered repository, it will pose an even lower risk to the environment.

With this in mind—namely, that engineered repositories lower the risk—AECL has directed CNL to accelerate the pace of decommissioning and disposal so that we can achieve the lower risk profile sooner rather than later and not delay to future generations what our generation should be responsible for.

Mr. Colin Carrie: Excellent. Thank you very much.

How am I doing, Mr. Chair?

The Chair: You have about 25 seconds left.

Mr. Colin Carrie: All right. I'll let the next questioner go. Thank you.

The Chair: We'll bank that, I guess.

We'll go now to Mr. Longfield for five minutes.

Mr. Lloyd Longfield (Guelph, Lib.): Thank you, Mr. Chair. Thank you, Mr. Carrie, for a really good line of questioning, and to the witnesses for your input.

Mr. Desbiens, you've been on the sidelines of this discussion. I'm wondering, from Quebec's point of view, what happens if we don't manage this, if we don't go to proper governance and storage of long-term nuclear waste through a deep underground repository.

[*Translation*]

Mr. Patrice Desbiens: Thank you for the question.

As Mr. Dermarkar said, it is quite simple to manage nuclear waste, because it is passive management. What you have to do is store it and make sure that everything goes well over time. By following basic monitoring and maintenance elements, you can deal with the waste for a long time.

That's what we're doing now. Even though we are already looking at a long-term solution, the endgame is still a few decades away. As Mr. Dermarkar said, the sooner the better, but in the meantime, it is relatively simple to deal with the waste well.

For the time being, we are doing it at the Gentilly-2 site. Our waste is in relatively new facilities. They are easy to maintain until the final stage can be carried out.

● (1255)

[*English*]

Mr. Lloyd Longfield: Thank you.

This is a long-term solution, and I appreciate that you're doing things safely and have been doing things safely there for a number of decades, but the problem still exists. What I'm hearing you say is that there is a nuclear waste challenge and we have to find a longer term solution for. You're nodding. That's great.

Also, Mr. McBrearty it's great to see you again. Thank you for spending time with me on this topic as I was educating myself for this study.

Mr. McBrearty, maybe I could start with you on new technologies. You mentioned some of the new medical isotopes being developed. We did discuss that previously. When we look at things like the chemical reprocessing that India's using, which a previous panellist told us about this morning, we see that it's not on the radar of Canada and not something that we're doing here. We are looking at pyroprocessing and Purex. How do those decisions go through the governance on how we process the nuclear waste in a safe manner?

Mr. Joseph McBrearty: There's a lot to unravel in that question, and that is okay.

We're concentrating right now on the low-level waste from our perspective, but your questions go into some of the future potential ways that we could reprocess or get rid of the waste. Certainly, the discussions on molten salt reactors lend some credence to that, but from a governance standpoint before anyone would ever even start to raise this, we would have to make sure that we had won the concurrence of the Government of Canada, that the government believes that would be a strategy we would embark on.

As you're well aware, NRCan is conducting a nuclear waste policy review. The draft comments are out on that. For the most part, I would say that we're looking at the more traditional, the deep geologic, repositories or near-surface disposal types of things. At the end of the day, the government would provide some direction and then we in the industry would analyze to see whether that was a feasible alternative. Then if it were a feasible alternative, it would be going to the regulator to analyze the safety case.

Mr. Lloyd Longfield: So we have several eyes looking at this, including the public, industry, the Government of Canada, the regulator and indigenous communities.

Mr. Joseph McBrearty: Yes, sir, that's true.

Mr. Lloyd Longfield: Thank you.

Mr. Dermarkar, when we're looking at other technology like fusion reactors, or the different options that might come in the future, how does AECL evaluate those options in terms of risk management?

The Chair: Be very quick, please.

Mr. Fred Dermarkar: AECL is actually technology agnostic. Our position right now is that we want to enable the development of new technologies and to make available our sites for demonstration, and our labs for research and development to enable new technologies.

Safety cases will be evaluated by the regulators. Safety cases will be made by the technology proponents, and we are there as enablers.

[*Translation*]

The Chair: Thank you.

Ms. Pauzé, you have the floor for two and a half minutes.

Ms. Monique Pauzé: Thank you, Mr. Chair.

Since I was a teacher in my previous life, I'm used to giving out assignments, so I'm going to give another one to Canadian Nuclear Laboratories.

Earlier, it was mentioned that experts had chosen the Chalk River site because experts in geology and hydrogeology had rigorously recommended it. However, the environmental impact study says otherwise. So I would like the committee to be provided with the names of the experts who gave the green light to the Chalk River site.

My next question is for Atomic Energy of Canada Limited and it has to do with finances.

In the 2020 report financial summary, under decommissioning, waste management and contaminated sites expenses, it shows that the cost was $26 million in 2017, $295 million in 2018, $713 million in 2019 and $955 million in 2020.

I would like to hear an explanation for this upward trend. What is the justification for this explosion in costs?

● (1300)

[*English*]

Mr. Fred Dermarkar: I'm not entirely sure of the numbers you are referring to, Madame Pauzé. But if the inference is to why the costs of the legacy waste liabilities are going up with time, the reason it that as we undertake work to address the legacy liabilities and we start digging into the ground to better understand what's there, because many of these liabilities date back to the 1940s, 1950s and 1960s, our records were not complete. As we start to address those legacy liabilities, we learn about the actual conditions and we are more informed about the cost of remediating the environment to address those legacy liabilities. For that reason the costs have gone up.

This is consistent with what we see in other countries, like the U.K. and the U.S. As they start to address their legacy liabilities from 50, 60, 70 years ago, they see their costs going up as well. The fact is that the actual legacy liability is going down with time as CNL executes the environmental remediation.

The Chair: Thank you.

Madam Collins.

Ms. Laurel Collins: Thank you, Mr. Chair.

The committee has heard some concerns about the reclassification of some mixed intermediate and low-level waste at Chalk River and about the consistency of classification standards across the industry.

Who decides on the classification of waste and the management solution?

Ms. Meggan Vickerd: I can take that.

The waste classification in Canada is identified in the Canadian standards. The nuclear industry has a CSA standard that identifies different classifications of waste. That is also consistent with the CNSC. The regulator identifies the four classifications of radioactive waste within their regulatory guidance.

Just out of interest, those classifications are consistent with IEA classifications for radioactive waste as well.

Ms. Laurel Collins: Have you heard the concerns about the classification standards and the consistency of classification across industry?

Ms. Meggan Vickerd: Yes. I do think there is perhaps a perception issue. We are consistent across the nuclear industry because it is identified in CSA standards and our regulator's regulatory guidance.

Ms. Laurel Collins: Mr. Desbiens, we've heard concerns from indigenous communities about the consultation process. Indigenous people have to be consulted in the selection of sites when issuing approvals. In your opinion and in the work you're doing, have indigenous people been engaged in a manner and on a timeline determined by those communities who are choosing to participate?

[*Translation*]

Mr. Patrice Desbiens: I can speak in regards to the Abenaki community located near the Gentilly-2 facilities, on the territory of the city of Bécancour.

I can confirm that the members of this community have been involved and consulted since the beginning of the decommissioning process. They have not expressed any discomfort. We keep them informed of what we are doing and we visit them periodically. To my knowledge, they are satisfied with the steps we are taking to keep them informed.

[*English*]

The Chair: You're pretty much at the end of your time, Ms. Collins.

We'll go to Mr. Seeback.

Mr. Kyle Seeback: Great. I'm going to try to do a little bit of cleanup as this is our last round here.

Mr. Dermarkar, you were giving an answer with respect to SMRs in earlier questioning. If you'd like to give a further answer or finish your answer, could you send that in writing to the committee, please?

For any of our other witnesses today, if you didn't get the time to fully answer a question, I would invite you to finish your answer in writing and submit that to the committee before we finish our study.

For everyone on the panel, does the system works? Are there any improvements that you would suggest? When I say the system, I mean managing nuclear waste.

● (1305)

Mr. Fred Dermarkar: Perhaps I will start.

In my view, it is a very effective system. I would like to put on the record that Canada is a signatory to the Joint Convention on Spent Fuel and Radioactive Waste Management. In that regard, every three years Canada puts itself in front of the world and describes what it does and how it does it. The rest of the world then has the opportunity to critique Canada and identify areas where they see gaps relative to best practice elsewhere in the world.

We have a very robust mechanism beyond Canada to confirm that what we do in Canada is in fact robust. Within Canada, we have multiple levels of oversight. We have the CNSC exercising oversight from a safety perspective. We have AECL exercising oversight from a quality, safety and financial perspective over what CNL does. We have CNL doing work to the highest standards because it's reaching back to internationally renowned experts to do its work.

Very briefly, I think we have a very robust mechanism in place for those reasons.

Mr. Kyle Seeback: I see, Ms. Vickerd, you have your hand up. Please go ahead.

Ms. Meggan Vickerd: Sure, thank you.

I just want to add to Mr. Dermarkar's response. From a floor level, we're responsible for an organization that manages nuclear waste every day. The system works because it protects the worker, the public and the environment. All interests are protected, ensuring that we are applying the best available technology. To me, the system does work.

Mr. Kyle Seeback: Is there anyone else?

Ms. Vickerd, I just want to go back to some questions about the risk of water contamination at Chalk River. You mentioned that you live across from the site and you have a well. I'm very familiar with that. I'm a rural guy; I live with well water. How do you assess the risk of contamination at Chalk River?

Ms. Meggan Vickerd: The current waste, as we've already identified, is low, and it's going to be even lower by putting it in an engineered containment system with the near-surface disposal facility. We have a very robust environmental monitoring program that includes groundwater sampling, surface water sampling and soil and air sampling, not only on the Chalk River site but off the site as well. We also look at ways of improving that program, and that's one of the areas we've been working on with first nations, ensuring that we incorporate some of their traditional knowledge into our environmental monitoring program and perhaps even have them conduct their own environmental monitoring.

Mr. Kyle Seeback: Thank you.

The Chair: Go ahead, Mr. McBrearty.

Mr. Joseph McBrearty: Thank you very much for the opportunity to comment here.

I don't think it can overstated that a good portion of the waste that we have today, as I said earlier, is exposed. It is exposed to the elements. When most folks think of nuclear waste, they think of it in sealed containers at nuclear power plants. The vast majority of our waste, about 500,000 cubic metres, is soil. It is in the soil, and it is in old building materials, World War II-era buildings that are far closer to the Ottawa River than the proposed NSDF.

The desire and the design of the NSDF is to reduce the risk to the public, as Ms. Vickerd said, to our workforce and to the environment. Frankly, I think it's probably the right answer—it is the right answer to go forward.

Thank you.

The Chair: Thank you.

We have 10 seconds left, Mr. Seeback.

Mr. Kyle Seeback: I would just say that if anyone has any other information they think would be relevant to the committee, please submit it in writing.

The Chair: Thank you.

Ms. Taylor Roy, you have the floor.

● (1310)

Ms. Laurel Collins: Mr. Chair, I have a point of order. How late are we going?

The Chair: Yes, I mentioned at the very beginning that we would go over time a little bit. We're down to the last questioner, so we'll be done in five minutes.

Ms. Laurel Collins: I'm so sorry; I do have to leave. I pushed it back as long as I could, but please proceed.

The Chair: That's fine, I think. Yes, thank you.

Go ahead, Ms. Taylor Roy.

Ms. Leah Taylor Roy: Thank you very much.

I was listening with interest when you were talking about the international review and how every three years, as a signatory, you go before an international body.

The United States Department of Energy also produced an international review panel report in 2020 for the Chalk River laboratory site, and in that report, they had 35 recommendations, 76 suggestions, and five best practices that would be followed.

In keeping with that comment you made about being a signatory and getting this feedback, were there any specific proposals that came back from that United States Department of Energy study that had been implemented or that you considered moving forward?

I guess a more basic question for me is: Why did the U.S. Department of Energy conduct a study of Chalk River?

Ms. Meggan Vickerd: Perhaps I'll start, and then Mr. Dermarkar can add.

Specifically, that study was an independent review that AECL commissioned to review our safety case for the near-surface disposal facility.

With respect to the recommendations, we've incorporated all of the feedback we heard into our safety case already. We've incorporated the information that is relevant to the current phase of the project. There are some recommendations for once we're into operation, but we haven't yet constructed the facility because we're awaiting a decision from the CNSC, obviously.

I just want to clarify that those best practices are things that we're already doing well. These are not best practices that they want us to do, but things that we have already implemented well.

Ms. Leah Taylor Roy: That's great. Given the time, thank you very much for clarifying that. That's great to hear.

The second thing I want to ask about is indigenous consultation, and you mentioned that the major difference between having the review done by the Impact Assessment Agency of Canada and the previous legislation under CEAA 2012 was the participation of indigenous communities.

I understand that you're grandfathered to a certain extent, but given the emphasis on truth and reconciliation, especially call to action 92, and given that we're signatories of UNDRIP, do you think that it would help relations with indigenous communities if you did proceed under the IAAC rather than the old legislation?

Mr. Joseph McBrearty: It's first important to understand that CNL and AECL fully support all indigenous rights under UNDRIP. We have done early and frequent engagement. We will continue to do that as we go forward. That is part of our process and it's part of our commitment. As I said earlier, when we look at the commitments we have made to the CNSC and to the community as part of our EIS and EA, those commitments are not only short term; many of them are very long term for long-term relationship agreements, etc.

Ms. Leah Taylor Roy: Could I ask a quick follow-up question? I have heard comments that some indigenous groups would like it done under the newer legislation. Why, then, would you not want to do it under IAC?

Mr. Joseph McBrearty: We believe that the CEAA 2012 process that we were grandfathered under is adequate to cover the parts of the IAA that you're discussing. Mr. Demarkar may have a further comment.

Mr. Fred Dermarkar: If I could add to that, just last week, Mr. McBrearty and I were at a session where there was a leader from first nations. One of his comments was that, for him, the path forward is very much about acknowledging the wrongs of the past and moving forward in partnership. It's not about moving forward in action plans, but in partnerships.

They are looking for substance in relationships and that's what we're pursuing. It's not so much about the process. His message to us—my takeaway of it—is that it's not so much about the process; it's about the substance of how we move together in partnership.

Both Mr. McBrearty and I are very strongly focused on this. Our staff, of course, is working on relationships with indigenous communities, but both of us are also personally committed to meeting with leaders from indigenous councils and chiefs.

● (1315)

Ms. Leah Taylor Roy: That's great to hear. Thank you.

The Chair: Thank you very much.

Unfortunately, we're out of time, but we had some wonderful discussions today in both panels. I want to thank the panellists from this panel for sharing their expertise and insights, and for answering all of the questions directed to them. Thank you again.

We have one more meeting left in our study. That will be on Thursday evening at 6:30. If members are wondering why, it's because the Board of Internal Economy has taken our 11 o'clock Thursday morning slot, which can happen from time to time, so we will be bumped to 6:30. I'm sure that it will be an excellent meeting, as well, and I look forward to seeing everyone on Thursday evening.

Thank you again to the witnesses.

The meeting is now adjourned.

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