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Safety Commission

Commission canadienne de  
sûreté nucléaire

Public meeting

Réunion publique

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Le 27 avril 2021

Public Hearing Room  
14<sup>th</sup> floor  
280 Slater Street  
Ottawa, Ontario

Salle des audiences publiques  
14<sup>e</sup> étage  
280, rue Slater  
Ottawa (Ontario)

*via videoconference*

*par vidéoconférence*

**Commission Members present**

**Commissaires présents**

Ms. Rumina Velshi  
Dr. Sandor Demeter  
Dr. Timothy Berube  
Dr. Marcel Lacroix  
Dr. Stephen McKinnon  
Ms. Indra Maharaj

M<sup>me</sup> Rumina Velshi  
D<sup>r</sup> Sandor Demeter  
M. Timothy Berube  
M. Marcel Lacroix  
M. Stephen McKinnon  
M<sup>me</sup> Indra Maharaj

**Secretary:**

**Secrétaire:**

Mr. Marc Leblanc

M<sup>e</sup> Marc Leblanc

**Senior General Counsel:**

**Avocate-générale principale :**

Ms. Lisa Thiele

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via videoconference / par vidéoconférence

--- Upon commencing on Tuesday, April 27, 2021  
at 9:30 a.m. / La réunion débute le mardi  
27 avril 2021 à 9 h 30

### **Opening Remarks**

**THE PRESIDENT:** Good morning and welcome to this virtual meeting of the Canadian Nuclear Safety Commission.

Mon nom est Rumina Velshi. Je suis la présidente de la Commission canadienne de sûreté nucléaire.

I would like to begin by recognizing that our participation today and our participants are located in many different parts of the country. I will pause for a few seconds in silence so that each of us can acknowledge the Treaty and/or Traditional Territory for our locations. Please take this time to provide your gratitude and acknowledgment for the land.

--- Pause

**LA PRÉSIDENTE :** Je vous souhaite la bienvenue, and welcome to all those joining us via Zoom or webcast.

I would like to introduce the Members of the Commission that are with us today, remotely:

Dr. Sandor Demeter;  
Dr. Stephen McKinnon;  
Dr. Marcel Lacroix;  
Dr. Timothy Berube; and  
Ms. Indra Maharaj.

I also have the pleasure to announce that Mr. Randall Kahgee was appointed by the His Excellency the Administrator of the Government of Canada in Council on February 26th as a Commission Member for a term of five years.

Congratulations and welcome to the Commission. Mr. Kahgee is joining us today as an observer.

Ms. Lisa Thiele, Senior Counsel to the Commission, and Marc Leblanc, Commission Secretary, are also joining us remotely.

As always, I would like to begin today's Commission Meeting with a Safety Moment.

For my Safety Moment today, I would like to draw from an article in the New York Times that I read last week and that focussed on our emotional state more than a year into this global pandemic. The article struck a chord with me and many around me, so I wanted to share some highlights with you.

The article was about "languishing", a term used to depict the state between feeling great and

feeling depressed, still having energy and not feeling hopeless but feeling somewhat joyless and aimless given the limited opportunities to connect socially and do the things we loved to do pre-pandemic.

As scientists and medical practitioners work to treat and cure the physical symptoms of COVID, many people are struggling with the emotional long haul of the pandemic and its impact on our mental wellness. It hit some of us unprepared. As the intense fear and grief of last year faded, it was replaced for many by a loss of vitality, a disruption of our ability to focus and a dulling of motivation.

Some call it COVID fatigue. If you are not careful and take steps to counter the languishing effects, it may lead eventually to mental illness. Part of the danger is that when you are languishing, you might not notice the dulling of delight or the dwindling of drive. You don't catch yourself slipping slowly into solitude; you are indifferent to your indifference.

When you can't see your own suffering, you don't seek help or even do much to help yourself. Even if you are not languishing, you probably know people who are. Understanding it better can help you or help you help them.

What can we do about this? Enjoyable experiences and meaningful work are all possible remedies

to languishing. Find ways to give yourself a sense of progress; appreciate small things that you find beautiful or captivating; have real, meaningful conversations; be honest about how you feel; and find time to challenge yourself on things that matter. Rediscover some of the energy and enthusiasm that you have missed during all these months and believe there is a light at the end of the tunnel.

Oh yes, and get vaccinated.

Thank you.

I will now turn the floor to Mr. Leblanc for a few opening remarks.

Marc, over to you...?

**MR. LEBLANC:** Thank you.

Bonjour, Mesdames et Messieurs.

J'aimerais aborder certains aspects touchant le déroulement de la réunion.

For this Commission meeting, we have simultaneous interpretation. Please keep the pace of your speech relatively slow so that the interpreters are able to keep up.

To make the transcripts as complete and clear as possible, please identify yourself each time before you speak.

The transcripts should be available on the

CNSC website within one to two weeks.

I would also like to note that this proceeding is being video webcast live and that archives of these proceedings will be available on our website for a three-month period after the closure of the proceedings.

As a courtesy to others, please mute yourself if you are not presenting or answering a question.

As usual, the President will be coordinating the questions. During the question period, if you wish to provide an answer or add a comment, please use the Raise Hand function.

The *Nuclear Safety and Control Act* authorizes the Commission to hold meetings for the conduct of its business.

Please refer to the agenda published on April 19th for the list of items to be presented today. In addition to the items listed on the agenda, CNSC staff will be providing an update on an outbreak of COVID-19 cases at a facility, after the NPP Status Report this morning, and will also provide a preliminary report on a possible exceedance of the dose limit for a Nuclear Energy Worker at a nuclear substance processing facility located in Montreal as the last item this afternoon.

I also wish to note that all the Commission Member Documents, or CMDs, listed on the agenda

are available on the CNSC website.

In addition to the written documents reviewed by the Commission for this meeting, CNSC staff and other registered participants will have an opportunity to make verbal comments and Commission Members will have the opportunity to ask questions on the items before us.

Madame Velshi, présidente et première dirigeante de la CCSN, va présider la réunion publique d'aujourd'hui.

President Velshi...?

#### **CMD 21-M13**

#### **Adoption of Agenda**

**THE PRESIDENT:** With this information, I would now like to call for the adoption of the agenda by the Commission Members, as outlined in Commission Member Document CMD 21-M13.

Do we have concurrence?

For the record, the agenda is adopted.



**CMD 21-M14/21-M15****Approval of the Minutes of Commission Meetings held on  
December 8-9-10, 2020 and January 21, 2021**

**THE PRESIDENT:** The minutes of the Commission meetings held on December 8th, 9th and 10th, 2020, and on January 21, 2021, were approved secretarially prior to today's meeting.

The approved minutes are available upon request to the Secretariat and will be available on the CNSC website at a later date.

The next item on the agenda is the Status Report on Power Reactors, as outlined in CMD 21-M16.

I note that we have representatives from the nuclear power industry and CNSC staff joining us for this item. They can identify themselves later, before speaking.

Dr. Viktorov, the floor is yours.

**CMD 21-M16****Status Report on Power Reactors**

**DR. VIKTOROV:** Thank you.

Good morning, Madam President and Members of the Commission. And, Madam President, thank you so very

much for that safety moment. This subject is very relevant to all of us.

My name is Alex Viktorov, I am the Director General of the Directorate of Power Reactor Regulation.

Other CNSC staff members as well as representatives of licensees are attending and will be available to respond to your questions.

The Status Report on Power Reactors, CMD 21-M16, was finalized on the 19th of April. The following are updates reflecting changes since that date.

For Darlington, Unit 1 is operating at 99.5 percent and is returning to full power.

OPG Darlington reported one additional COVID-19 case under REGDOC-3.1.1 reporting criteria.

For Pickering, Unit 1 is at 96 percent of Full Power due to fuel-handling system maintenance.

OPG Pickering reported three additional COVID-19 cases under REGDOC-3.1.1 reporting criteria.

For Point Lepreau, the unit is at less than 1 percent full power following restart after an unplanned outage.

This completes the verbal update on the status of power reactors.

CNSC staff are available to answer any

questions you may have. Thank you.

**THE PRESIDENT:** Thank you.

I will now open the floor for questions from Commission Members to CNSC staff and licensees. We will start with Dr. Demeter.

**MEMBER DEMETER:** Thank you very much.

The question is for Point Lepreau and it is specifically related to the primary heat transport pump motor 3 where the degradation of the neoprene got hit with the overheating and caused a fire.

I want to ask Point Lepreau: Could have or should have this degradation been picked up through team preventive maintenance and what is the plan on a go-forward basis for such events?

**MR. NOUWENS:** Good morning.

**THE PRESIDENT:** I'm sorry, Jason Nouwens, please.

**MR. NOUWENS:** Thank you. I'm sorry.

Good morning and thank you for the question. For the record, my name is Jason Nouwens, Director of Regulatory Affairs.

In anticipation of questions around our primary heat transport event, we do have a short presentation prepared. So I would like to turn it over to Mark Power, our Site Vice President, for a brief opening

comment and then we will turn it over to our Regulatory Affairs Manager for the presentation.

So, Mark Power, over to you, please.

**MR. POWER:** Okay. Good morning. Thank you.

Can everyone hear me fine?

**THE PRESIDENT:** Yes, we can.

**MR. POWER:** For the record, my name is Mark Power, I am the Site Vice President, and I would like everybody to know that we are taking this fire that we had very seriously. It was certainly a one-of-a-kind for us, first-of-a-kind and, as Jason said, before turning it over to Nick Reicker, our Regulatory Affairs Manager, for a very brief presentation, I would like to also stress that we are learning from this event. We have initiated a root cause and we are well underway as per our corrective action process and we will be identifying corrective actions that will prevent further recurrence.

One thing that this fire did illustrate for us is that due to the training of our emergency response team that they effectively and efficiently were able to respond. So it was a very good experience going through that fire that they were as effective as they were.

So without further ado, I will turn this over to Nick Reicker, our Regulatory Affairs Manager.

**MR. REICKER:** Thank you, Mark.

Is everyone able to hear and see me?

**THE PRESIDENT:** Yes, we can.

**MR. REICKER:** Thank you.

Mario, I do have a brief couple of slides. I don't see the option to be able to request remote access and I'm wondering if you could bring up the presentation and maybe I will just request to advance to next slide.

Okay. So if you move to the next one, please.

So to start, I would like to thank the CNSC for the continued regulatory oversight and continued intrusiveness as part of this event, but also as part of continued operations on site.

On February 5th, the station was progressing run up as a result of a return to service activities following the maintenance which we performed.

At approximately 4:30 a.m. in the morning a fire was reported on our primary heat transport pump motor number 3 and it was localized to the braking assembly area. The fire was localized to the reactor building within containment and there were no impact to employees, the public and the environment.

For context, there are four primary heat transport pump motors within the reactor building and their

function is to transport heat from the fuel and the reactor core to our steam generators.

Next slide, please.

So, as Mark mentioned, we are very pleased and proud of our response, both through our Emergency Response Team and through our mutual aid responders, being Saint John Fire Department and Musquash Fire Department are both local area responders.

When the indication of the fire was identified, our Emergency Response Team immediately responded to the reactor building. They did a thorough assessment and identified that the localized flames could be observed on the top of the primary heat transport pump motor and the braking assembly. Once approval was obtained from the shift supervisor, then they were allowed to proceed with providing an extinguishing agent. We did it both through dry chemical and CO<sub>2</sub> to provide cooling.

The mutual aid response supported in all aspects of extinguishing the fire, but also in the subsequent hours they provided cooling of the equipment to make sure that we were down to below operational temperatures.

As we were currently into a forced outage, our organization supported through the Outage Control Centre and that provided direct support to the Emergency

Response Team, to the shift supervisor and all areas of the organization to make sure a sustained and coordinated response.

And you can see from the photograph that the fire was localized to the braking assembly on the very top and you can see the discolouration actually on top of the motor and that is the braking assembly proper and you can see a little bit of powdered material and that is actually the dry chemical agent which was applied. So we can see that is very localized to that exact location on that motor.

Next slide, please.

So as part of actions taken we did a failure analysis on the brake assembly to determine the cause of the brake failure and it was determined that it was around the inner tube. So for context, that is an inner tube assembly, the same as you would see in a car or vehicle, around it, and when that inflates it exerts pressure onto the braking pads, brake shoes, which apply slowdown or stopping force to that motor.

In part of our analysis we actually get very intrusive and we cut open the bladder assemblies and we identified that there was delamination in the plies. So there are multiple plies within those bladders and with the delamination between those plies it allowed that there was

an isolated pocket of pressure which was applied to several shoes, and once the pressure was applied to those several shoes that resulted in an overheating similar to what would happen in your vehicle if you were driving down the road or highway with your foot gently on the brake. Over time you are going to see increased friction and overheating conditions.

So as a result of understanding the cause, we actually replaced all of the brake assemblies and all the bladders on all four primary heat transport pump motors. The impacted motor, PHT pump motor 3, was replaced with a spare motor that we had available and a complete swap out of that unit, and that was based on making sure that we had an understanding of all damages that would have resulted from that fire and whether to the brake assembly or not, but if there was anything internal to that motor, which we are currently doing a thorough review on.

Following that we did post-maintenance testing and the station was successfully returned to service on February 26th.

We have looked at the preventive maintenance strategies for the pump motor braking assemblies and looking for delamination is our improved focus to ensure that we mitigate and identify any future issues that could come up. In the past practice we would



look at visual inspection of the bladders, making sure there were no signs of degradation, but now knowing the operating experience that we have, that we need to be very intrusive with those and making sure that we are changing those out.

So with any event that happens as part of continued operations, keeping the public and community informed is key and maintained in an open and transparent relationship.

To the final -- or more on this, I would like to ask Ms. Kathleen Duguay, who is our Manager of Community Affairs and Regulatory Protocol, to provide some additional information on this.

**MS. DUGUAY:** Can you guys hear me?

**THE PRESIDENT:** Yes, we can.

**MS. DUGUAY:** I can't hear you at all, but I will -- I don't know if somebody can fix that for me, I just can't hear you, but I will share what we have done in terms -- from a communication and public disclosure protocol around this event.

As you know, part of our openness and transparency is to ensure that we keep our public informed, and especially our communities. So in addition to posting the event on our website, I had several conversations with the community. We covered it in our community relation

meeting. We also notified our First Nation point of contacts as we keep them informed of any activities that are going on here at the station.

So if there are any questions, I'm sorry, I can't hear anything.

It is part of our normal practice to do that and to reach out to the community. And again, like we had in our event last -- early in the year, they say, we know we are going to hear from you, and this time we were ahead of the game, we reached out to them before we had published it on our website. So this is really good practice for us and we aim to continue those best practices. Thank you.

**MR. NOUWENS:** For the record, Jason Nouwens.

I am not sure if that presentation adequately addresses your question. However, we do also have our Station Director available online if that presentation was not sufficient for that question or if there are other related questions.

**THE PRESIDENT:** Thank you.

Dr. Demeter, did you have any follow-up questions?

**MEMBER DEMETER:** No. I will leave it for other Commissioners. Thank you very much.

**THE PRESIDENT:** Okay. Thank you.

Dr. McKinnon...?

**MEMBER MCKINNON:** Yes, thank you. I have a question also for Point Lepreau and it is in terms of fire control systems.

I am wondering if you could describe a little bit more about the fire control systems that you have in place, because it seems this one was intervened with manually and I'm sure fire control where there are a lot of complicated electronics and so on, it can't be just an automatic sprinkler system. So if you could just describe a little bit about the different fire control systems in place.

And secondly, how is fire control managed in terms of the site's risk assessment analysis?

**MR. NOUWENS:** Jason Nouwens, for the record.

For the first question, our fire response varies depending on the location of the station. So we have a very rigorous process where we have a fire hazard assessment which assesses every area of the station with respect to fire risk and we also have a fire safe shutdown analysis which assesses any risk from fire from a safe operation of the station. Both of those combine to give us a detailed analysis of the requirements within each of the

station areas and according to the risks that are proposed -- or, sorry, the risks that each area may pose, the fire response is tailored specifically to address those needs.

So, for example, in our turbine system where it would contain lubricating oil, we have foam, they call it AFFF, which is anti-fire foam fighting agent. We will have a system like that in place.

For the PHT pump specifically in this case, we have manual intervention and we have pre-deployed manual intervention devices in the area. So it wasn't in the presentation picture, but just outside of that area that you saw there is pre-deployed carbon dioxide dry chemical agent as well as foam fire agent that is available to the ERT to respond. So every area of the station has a pre-deployment plan and the ERT is trained on exactly how to respond to any fire in any area of the station.

With respect to your second question, I believe if I interpreted your question correctly, you are wondering what the link is between fire and our probabilistic safety analysis?

**MEMBER MCKINNON:** Yes. And also the action response, you know, action response type assessment. So if you assess in advance the risks and the type of fire -- you have partially answered the question that I was

thinking about with all of the different types of materials you would use to control the fire, but I guess you have pre-assessed, done an assessment through your risk analysis for the types of controls that would need to be in place. Is that right?

**MR. NOUWENS:** That is correct.

**MEMBER MCKINNON:** Okay.

**MR. NOUWENS:** That is correct. We have analyzed every fire and we have assessed basically the worst-case scenario and made sure that we have measures in place to mitigate any potential consequences. So we have layers of defence in depth for every potential fire scenario that we have pre-deployed.

**MEMBER MCKINNON:** Okay, that's great.

Thank you very much.

**MR. NOUWENS:** Thank you.

**THE PRESIDENT:** All right.

Dr. Lacroix...?

**MEMBER LACROIX:** Yes. I will change the subject, if I am allowed. This is a question for Pickering Station concerning the incident that occurred at the Unit 5 fuelling machine. I was wondering what sort of damage was inflicted to the fuel bundle, and once a fuel bundle has been damaged, is it put in the same irradiated fuel pool as the undamaged fuel bundles? And will this fuel bundle be

inspected, let's say 10 years down the line when you transfer this fuel bundle from the wet storage to dry storage? So could you elaborate on this incident, please?

**THE PRESIDENT:** Mr. Bevacqua, over to you.

**MR. BEVACQUA:** Thank you, Madam Chairman. It is Val Bevacqua, for the record. I am the Director of Operations and Maintenance for the Pickering site.

So the fuel bundle that was recovered, the pencils had splayed, come -- if you are familiar with the fuel bundle, they had come apart from the end fitting. They were dry-casked and brought over and they are currently in the irradiated fuel bay. That fuel bundle is set to be inspected and we do have as part of our program in our long-term program we will be recovering any damaged fuel from our irradiated fuel bay. But the irradiated fuel bay is designed to keep fuel cool whether it is coming out of the reactor intact or splayed in this manner. So there are no concerns around the long-term storage or cooling of this fuel.

I hope that answers your question.

**MEMBER LACROIX:** Yes, indeed. Thank you very much.

**THE PRESIDENT:** Maybe I can ask you a subsequent question to that. How often do you get damaged irradiated fuel?

**MR. BEVACQUA:** Damaged irradiated fuel, I would have to lean on our experts to give you a quantitative number. It is very, very infrequent. All the fuel bundles are handled by our robotic fuelling machines. We do have an inspection program where we validate that the bundles are coming out in good condition, but it is not in any way a frequent occurrence.

**THE PRESIDENT:** Okay. Thank you. Is it like once a year or once every 10 years?

**MR. BEVACQUA:** I would have to ask one of my experts. I don't know if Mr. Vecchiarelli or one of our support team have any frequency for us that they can share at this time or else we will take the action to report back.

**THE PRESIDENT:** Thank you.

Dr. Viktorov?

**DR. VIKTOROV:** So Alex Viktorov, for the record.

To supplement the discussion on fuel bundle damage, normally there are no fuel bundles damaged in operation. Occasionally there may be one or two bundles with minor damage. So at most we see one or two bundles per year. Annually all licensees report to us on fuel performance. By the mid-year we get a summary of fuel performance during the year. So all information is

reported to CNSC and is assessed subsequently. We know every year the statistics of how well fuel performs, so we are pretty sure that this kind of damage has not occurred in the last decade or so. But minor damage we may see one or two bundles per year.

**THE PRESIDENT:** Thank you. That is very helpful.

Ms. Irvine, you had something to add?

**MS. IRVINE:** Yes. For the record, I am Sara Irvine, Manager of Regulatory Affairs at Pickering. We will take an action to provide the information on the rate of fuel damage. And I did want to clarify that the sheath was intact, that it was just mechanically separated and there was no bundle -- or, sorry, pencil damage. Thank you.

**THE PRESIDENT:** Thank you.

Dr. Berube...?

**MEMBER BERUBE:** Yes. In that particular vein I just wanted to ask, were all the operations carried out by the fuelling machine themselves or was there a human intervention required to actually extract this particular bundle?

**MR. BEVACQUA:** Thank you. Val Bevacqua again, for the record.

So we did attempt removal with the



fuelling machine. When that was unsuccessful there was manual intervention to discharge the bundle from the fuelling machine directly into a shielded flask. I hope that answers your question.

**MEMBER BERUBE:** And this is something you do fairly regularly, so you have procedures in place to deal with the radiation that is there?

**MR. BEVACQUA:** Actually, no. The last occurrence of this was -- of this manner was in 1993. So we did have some legacy procedures, but we treated it as a first-of-a-kind evolution, developed and validated the procedures in mock-ups on another unit first, and followed our operation decision-making process where I approve the recommendations to recover the fuel.

**MEMBER BERUBE:** The last question there is meant to do with the operators actually undergoing that procedure. What were the radiation dosages, like any additional uptake as a direct result of this activity?

**MR. BEVACQUA:** The way we formulated the recovery, we set up the recovery equipment in the vault where the fuel was not present and then moved the fuel into that area. So there were no people in the area when the recovery was performed. It was all done remotely. So there was no dose uptake during the recovery of any of the staff.

**THE PRESIDENT:** Ms. Maharaj...?

**MEMBER MAHARAJ:** Thank you, Madam Velshi.

I have two questions with respect to Point Lepreau. The first, we have spoken about the fire, but the second incident with respect to the exhaust rupture disc failure where the unit is currently shut down, do the staff from Point Lepreau have an idea or a sense of how long Point Lepreau will be shut down with respect to this second incident?

**MR. NOUWENS:** Jason Nouwens, for the record.

My connection disconnected on me right in the middle of your question. Could you repeat that question again?

**MEMBER MAHARAJ:** Absolutely.

I am wondering whether or not you have a sense of how long Point Lepreau will be shut down as a result of the incident on April 17th with the station turbine exhaust rupture disc failure?

**MR. NOUWENS:** Thank you. Thank you. That time it came through. Jason Nouwens, for the record.

We expect to return to full power operations this weekend.

**MEMBER MAHARAJ:** This weekend, excellent.

And I had a follow-up question with

respect to the processes for manually tripping the reactors. Both of these incidents seem to reflect that a person -- a manual trip had to be effected. And you mentioned in your submission that there are layers of fire protection and safety protection. Could you elaborate on what layers would follow a manual trip? What if that individual was incapacitated by some means? What's the next step?

**MR. NOUWENS:** Sure. That's a very good question, and I will turn this over to our station director. But ahead of turning over to Joel, I will just mention that we have fully automatic systems in place that require zero manual intervention. So if we did nothing, the station would safely shut down; however, there is some cases where manual intervention makes it an easier transition from a running state to a shutdown state, and we will make that choice to do that. But there's no safety implications. And if there was nobody available, the system would automatically shut the station down safely.

So I'll just turn it over to our station director, Joel Armstrong, if there's anything you want to add to that question.

**MR. ARMSTRONG:** It's Joel Armstrong, station director at Point Lepreau, for the record.

Really, Jason covered the question

adequately, in my opinion. But our staff are trained to manually intervene with shutdown system one in this case if required. But of course, as Jason alluded, our station will control itself and automatically shut down if required.

In addition to that, our team had actually recently trained on an event caused by an AC exhaust failure. So we were very well prepared. The station was shut down safely and orderly as per our guidance and governance. No issues to report on our shutdown. And as I mentioned, our staff are qualified and more than adequately trained to shut down as required both in a manual incident like this, and of course we have automatic control if required.

**MEMBER MAHARAJ:** Thank you very much.

**MR. ARMSTRONG:** I hope that answered your --

**MEMBER MAHARAJ:** Yes, sir.

**THE PRESIDENT:** Okay, good, Thank you.

I have some questions for both OPG and CNSC staff. And this is with respect to item 1.5 in the status report regarding safety of Pickering NGS and pressure tubes.

And let me start off by saying that from the Commission's perspective, the Pickering Nuclear

Generating Station's renewal hearing in 2018 included the evidence that was required for the Commission to fully canvass the issues including the issue of the safety of the pressure tubes. And the Commission has since been provided no information or reports on which to question that evidence or its conclusions.

So let me start with OPG. The *Globe and Mail* article which is attached to the status report has a quote claiming you are "playing Russian roulette with the Canadian public."

At present, are there data that OPG has on Pickering's pressure tubes that could call into question that the continued operation of Pickering is currently safe? Mr. Vecchiarelli?

**MR. VECCHIARELLI:** Good morning President Velshi and Members of the Commission. For the record, I'm Jack Vecchiarelli, vice-president of Nuclear Regulatory Affairs for OPG. And thank you very much for the opportunity to comment on this matter.

I will invite Sara Irvine to provide a more detailed response. She is, as you know, our Pickering Regulatory Affairs manager, but she is also an expert on the topic of pressure tubes.

And the short answer to your question is that there is no evidence that contradicts our position

that Pickering is safe to operate. And I'd like to elaborate on this, if I may.

With respect to the *Globe and Mail* article, we did note a number of inaccurate statements, which is quite unfortunate, because although there was no mention of this in the article, our chief nuclear engineer was interviewed at the time to help provide a foundational understanding of the technical work carried out by our staff to ensure the safety of operations and to validate that there were no safety issues concerning the topic at hand.

Nonetheless, at a high level, and on behalf of OPG, I would like to state that OPG is committed to meeting stringent regulatory requirements, and nuclear safety has always been our unwavering and overriding priority. We have a very robust fitness for service program which follows a science-based approach. As such, any data gathered as part of our reactor inspections undergoes a rigorous quality assurance assessment to ensure that it is valid and appropriate for use.

And on this very point regarding the data questioned in the *Globe and Mail* article, the data were not used to determine the station's fitness for service. This correct determination was in accordance with our quality assurance process. In no way did this affect ongoing or

future safe operation of the station.

As affirmed during the 2018 Pickering relicensing process, the Pickering station is operated safely.

I will now ask Sara Irvine to clarify further. Sara?

**MS. IRVINE:** Thank you, Jack.

And good morning, Present Velshi and Members of the Commission. For the record, my name is Sara Irvine and I'm manager of Reg Affairs at Pickering Nuclear.

As you know, at Pickering we take measurements each and every day with the purpose of validating the integrity and safe operation of our various systems and their components. This includes periodic sampling of the inside of the pressure tubes and analyzing the hydrogen content of those samples as one of many ways of demonstrating the safe operation of our reactors and meeting our regulatory requirements.

When the data referred to in the media underwent our staff's rigorous quality assurance reviews, it actually appeared more favourable than typical results, and the results didn't align with our expectations. Because it was more favourable, the data was not used in any safety-related assessments. In fact, it would have been non conservative to do so.

Our observations were shared with CNSC staff along with a commitment to thoroughly assess the situation and communicate our findings with CNSC staff. Through a rigorous assessment of their processes, the vendor who analyzes these samples determined that their equipment needed recalibration.

Since that recalibration, our data has consistently proven to be accurate and OPG will continue to meet our stringent licensing requirements to ensure fitness for service of station components.

Again thank you for the opportunity to comment on this matter.

**THE PRESIDENT:** Thank you.

Mr. Granville?

**MR. GRANVILLE:** Yes, thank you, Madam Chair. So my name is Sean Granville. I'm the chief nuclear officer at OPG. And I just want to reinforce what Sara and Jack laid out for the Commission.

You know, OPG, we really believe in openness and transparency and ensuring that the public has the information needed to develop an informed understanding of our nuclear operations.

Our culture of safety and integrity is ingrained in our company from the operators in the control room, our front-line engineers, all the way up to the board



of directors.

And that's exactly how it played out in this situation. You know, Jack and Sara laid it out, but in summary, there's really no story here.

But regardless, as OPG's chief nuclear officer, you have my commitment that we'll continue to operate our nuclear facilities to ensure continued protection of our employees, the public, and the environment. We'll be guided by our licence commitment, our strong pursuit of excellence, and our values, in particular our very strong nuclear safety culture.

You know, in short, we're here for the public. We're providing critical power to the public. And in particular, we are providing clean air.

So thank you very much. And that ends my remarks.

**THE PRESIDENT:** Thank you.

I have another question for OPG. The article also mentions that in a worst-case scenario of pressure tube failure an accident similar to Fukushima is possible.

What is the worst-case scenario resulting from pressure tube failure? Mr. Vecchiarelli?

**MR. VECCHIARELLI:** For the record, Jack Vecchiarelli.

We look at a wide range of possible accident scenarios with the probabilistic safety analysis. That is a very comprehensive approach which looks at what could possibly happen, how likely is it, and what are the consequences.

And when you look at this wide spectrum of hypothetical possible scenarios, the risk is extremely low. We have safety goals that look at core damage frequency and the frequency of a large release. These are very low where compliance with the regulatory requirements and our state-of-the-art probabilistic safety analysis follow international best practices. So these are very extremely low possibilities. The risk is low.

**THE PRESIDENT:** Mr. Vecchiarelli, you have had pressure tube failures at Pickering. Tell me what the consequences of that were.

**MR. VECCHIARELLI:** I will refer to Sara Irvine for some background on this, but I just want to elaborate. As all our stations have like multiple layers of defence in-depth, and so whenever there's a consideration of a possibility of an event occurring, there's multiple backups to mitigate the consequences.

So I'll defer to Sara to talk about the previous incident on that matter. Sara?

**MS. IRVINE:** Sara Irvine, for the record.

So yes, the *Globe* article did actually refer to some of our early failures. And those were due to degradation mechanisms and factors that have since been factored out, essentially. The issues that caused those no longer exist in today's pressure tubes.

And when those happened, it was mostly an economic penalty taken. The unit was shut down safely. Everything behaved as expected. No impact to the public. And again, the units were recovered and started up again after those failures. But again, no impact to the public from a single fuel channel failure.

Thank you.

**THE PRESIDENT:** Thank you.

Maybe I'll turn to CNSC staff. The Ontario Clean Air Alliance currently has a social media campaign underway regarding Pickering. One of its allegations is that the CNSC has allowed the continued operation of Pickering despite knowing that the data supplied by OPG on pressure tubes is, as they quote, "flat-out wrong."

Are there errors and wrong data in the submissions that CNSC staff have from OPG? OPG has said that they did not submit that, but I'd like to hear from staff on that.

And the second part of my question is

please explain how CNSC staff verify and assess the data that is submitted by OPG.

**DR. VIKTOROV:** So Alex Viktorov, for the record.

Let me start with this, and then I'm sure various CNSC staff can supplement.

Several points I would like to emphasize. Coming back to the earlier question, perhaps, pressure tube failures are considered in safety case for all CANDU reactors. And they are in fact part of the design basis. There are multiple design provisions that take care of consequence of such an event, and it's shown through analysis and tests that the risk to public and workers is not significant. In fact, it's quite minor. There may not be even the fuel failures as a result of such event. So claims of Russian roulette being played with the Canadian public are grossly overstated and in fact incorrect.

I will also unequivocally state that CNSC staff never overlooked data. We analyzed data provided by OPG Pickering as well as other reactors, other operators of CANDU reactors very carefully.

There are stringent requirements for various data to be provided to CNSC on an ongoing basis as part of inspection campaigns, and there are in place various standards developed based on the latest science and

technology that assure that various degradation mechanisms are carefully monitored, assessed, and the safety case is confirmed.

So CNSC staff is very confident in its conclusions at the time of Pickering relicensing and at this present time. We stand by our conclusion that operation of any CANDU reactor will not be allowed here unless there is a stringent safety case.

And I will ask Ramzi Jammal, the executive vice-president of CNSC, to summarize the situation in more general terms.

**MR. JAMMAL:** Good morning, Madam President and Members of the Commission. For the record, my name is Ramzi Jammal, executive vice-president and chief regulatory operations officer at CNSC.

Madam President, we're compelled under section 9 of the Act to disseminate scientific and objective information, hence my response. To complement Dr. Viktorov's answer, our regulatory oversight continues at all times.

With respect to the benchmarking internationally, our staff do have direct access to the licensees' computers and assessments and the station condition reports by which we are monitoring of any events that they do take place. At any time our staff feels that

there is any compromise or not meeting regulatory requirements, they have the full power to shut down the operation and request a forced outage in order to render the situation safe.

There was a discussion with respect to the PSA or probabilistic safety assessment. The fact that Dr. Viktorov mentioned that the pressure tube failure is within the design basis accidents where the systems are designed to shut down the operations safely. Post-Fukushima, the Commission directed and we imposed on the licensees to take mitigation measures for beyond design basis accidents.

Hence the -- it's unfortunate that the misinformation presented in the article with respect to the Russian roulette, or the campaign of false information being presented to staff; where staff did not recognize that information presented to them is inaccurate. That is not true, as mentioned by Dr. Viktorov. The safety case is still valid.

We will continue to oversee the operations. And as you see before you, status report, it doesn't matter if it's an outage for maintenance or forced outage, we report to you on a monthly basis with respect to these operations of the nuclear sites and nuclear facilities.

So in conclusion, the fact that we have

presented technical information and technical recommendation in 2018 is still valid. We will continue our oversight in order to make sure that the fitness for service continues to meet our requirements. And any time -- at any time, our inspectors on their own -- they do not need to go to their management, they do not need to go to the Commission -- they can stop the operations if they feel that there an imminent risk for safety.

So in conclusion, the public is protected; the workers are protected; and the environment is protected. At no time the allegation presented in the campaign or in the articles were accurate, and hence the section 9, I am compelled to set the record straight with respect to the scientific information before you and the objective decisions that staff give you, recommendations supported by technical information.

**THE PRESIDENT:** Thank you.

Let me ask the Commission Members if they have any further questions on this section 1.5 of the status report. All right, I see no hands up.

So thank you, OPG and CNSC staff for providing this information. This has been an important and informative session.

I'd like to say something to everyone with us today and to the people of Pickering and beyond. In

recent weeks, we've heard from some who engage in sensationalism and who prefer to either misrepresent or ignore the facts. And so I want to be clear: Safety has been and always will be the top priority of this Commission. It is the lens through which we see our work, the nuclear industry, and our world. We are rigorous in our dedication to safety and to keeping people and communities secure.

This Commission is proudly and crucially independent in our findings. We are at all times guided by science and fact, not by guesswork, conjecture, nor by politics. Our role is to keep the people of Canada safe, and it's a role we fulfill every single day.

Thank you.

Commission Members, did you have any questions on other aspects of the status report or can we move on?

Dr. Berube?

**MEMBER BERUBE:** Yes, just one final question for Point Lepreau on the rupture disc incident. Last time I think we talked about this, we were looking at a root cause analysis to determine what the high pressure transient was. Is there any clarification at this point now that we're returning to service on the status of what actually caused that failure?



**MR. NOUWENS:** Jason Nouwens, for the record.

I just want to I guess clarify one point in your question. There actually wasn't a high-pressure transient. The rupture disc that did relieve really did its intended job, it just did it at a lower pressure than it was designed for. There wasn't actually a plant transient that resulted in an over-pressure condition that caused a rupture disc to relieve.

That being said, we are still progressing through our causal analysis. We have seen some I guess initial indications that from a design and maintenance point of view that there's some improvements that could be made. This rupture disc that we're using is a 42-inch design. The design itself is very robust, but the size that we're using is a new design for both the OEM and for us as an industry. So there is some learnings that we are getting from that, and we are applying those lessons learned to the reinstallation that we're going through right now. But the final causal analysis has not yet been completed.

**THE PRESIDENT:** Dr. Lacroix?

**MEMBER LACROIX:** Yes, this is a snap question for Darlington concerning the spill of heavy water.

It says that there's no significant releases of tritium to the environment and no significant uptakes of tritium by workers. And what do you mean exactly by "no significant"?

**MR. GRACE:** Yeah, good morning. Allan Grace for the licensee. I'm the plant manager here at Darlington.

Yeah, the word "significant," I'll say nothing about what our normal processes would allow. So in terms of tritium perspective, all the mitigating strategies we put in place during our outages proved very effective in that there was really nothing above baseline or very minimal above baseline. And similar with worker uptakes, nothing outside of any normal dose limits for average activities.

**MEMBER LACROIX:** Okay. Well, I would have appreciated that you mention it in the report itself. It's more accurate. Thank you.

**THE PRESIDENT:** Okay, thank you.

We do have an additional item for the status report, and I understand that CNSC staff has an update about an outbreak of COVID-19 cases at Canadian Light Sources facility. And I believe they've got representatives from CLSI also on hand to answer any questions we may have.

So Mr. Broeders, over to you, please.

**MR. BROEDERS:** Thank you, Madam President.  
Good morning to yourself and Members of the Commission.

My name is Mark Broeders. I'm the director of the Accelerators and Class II Facilities Division.

We're here today to provide a report of a disruption to operations at a Class I facility due to a COVID-19 outbreak.

I'll ask Ms. Leah Shuparski-Miller to provide the details of the report.

Ms. Shuparski-Miller?

**MS. SHUPARSKI-MILLER:** Good morning, Madam President and Members of the Commission.

My name is Leah Shuparski-Miller. I am a senior project officer in the Accelerators and Class II Facilities Division.

Canadian Light Source Incorporated, or CLSI, has informed the CNSC of an outbreak of COVID-19 cases of employees at its facility. As of April 19th, there were 12 confirmed cases of employees who have tested positive for COVID-19. CLSI, affected employees, and close contacts are following the direction and safety protocols of local health officials, Saskatchewan Health Authority.

CLSI entered a state of warm standby mode,

limiting site access to only essential staff to monitor safety and security of the facility. As of April 19th, CLSI has begun gradual return to operations coincident with the implementation of COVID safety protocols.

The measures taken by the licensee are acceptable to CNSC staff, and staff confirm that there is no radiological impact on workers, the public, or the environment.

I'd now like to turn the floor over to Mark Broeders.

**MR. BROEDERS:** Thank you, Leah.

This concludes our verbal report. Staff remain available to answer any questions the Commission may have.

**THE PRESIDENT:** Thank you.

Let's open the floor for questions, Commission Members.

And maybe while we're waiting, so staff, you said that with the restarting of employees coming back to the office as of April 19th, the protocols have been revised. Tell me what the revisions are and why would they not have been in the initial protocols that were in place?

**MR. BROEDERS:** Mark Broeders, for the record.

I'll suggest that CLSI provide some

details of their revised protocols, if I may.

**MR. CUBBON:** Sure, I can --

**THE PRESIDENT:** Of course. Go ahead.

**MR. CUBBON:** Sure. Good morning, everyone. It's Grant Cubbon. I'm the Health, Safety and Environment manager of CLSI.

Yeah, just with respect to the incident, Leah accurately described what happened. Essentially, we went through and interviewed all of our staff, plus we turned over to SHA all the information pertinent so they could continue contact tracing within the province.

And essentially, we found the causes of the outbreak are -- some of the factors that impacted it were we weren't satisfied with some of the masks we had provided. We had allowed lunch rooms to be accessed, albeit on a very limited capacity. And we also hadn't really implemented any cohorts with respect to our staffing. So those are essentially the changes we made.

Basically we now provide a medical-grade mask that staff are required to put on at the start of each day. That's provided at the entrance to the facility. And we now have segregated our maintenance staff, in particular, into cohorts to help restrict access to different groups and things like that. And then we now have a limit of one in any of our meeting rooms at a time,

and also have no access -- we're not permitting people to eat lunch in the lunch room anymore. They're now eating at their desks or eating outside on some benches we have available.

**THE PRESIDENT:** Thank you.

Anyone else with any questions? Dr. Demeter?

**MEMBER DEMETER:** Thank you.

I just had a question with regards to operations at CLSI. Is there an equivalent to a minimum shift complement to maintaining things running in the background? And how close are you to that kind of minimum shift for background operations?

**MR. CUBBON:** Sure. I can speak to that. It's Grant Cubbon from CLSI.

So we do have a minimum staff complement when we are in normal operating mode, that is with the beam on and that consists of one operator in a position we call a floor coordinator. But basically, it's two operators on site that are trained to perform the roles of operating the machine and maintaining communication with our scientists on the experimental floor.

At the time of the outbreak and continuing so right now, we are in a scheduled maintenance outage, so our minimum staffing complement is greatly reduced. We do

keep an operator on site 24/7 to monitor the control room, but there's no real operations going on during regular business hours. We have an HSE staff member and of course we have a complement of on-call staff should something arise.

So our minimum staff complement is indeed very minimal at a facility like ours. The operation is pretty straight forward.

**THE PRESIDENT:** Thank you.

Maybe a question to staff. Given what has been learned from what's happened at CLSI, how is this being shared with other licensees, or is it?

**MR. CUBBON:** So we haven't expressly shared this with other licensees. We have posted this on our website as an information. We shared it with the University of Saskatchewan as well, and then Public Health or Saskatchewan Health Agency also shares the information regarding an outbreak on their website as well.

**THE PRESIDENT:** Thank you.

Mr. Broeders, how about CNSC licensees?

**MR. BROEDERS:** At this time, we haven't shared with our other licensees. Every licensee is required to have emergency response protocols in place. It's commensurate with the risk of the facility. And hence the reason that CLSI reported to us, because they had to

implement a contingency plan because of the disruption to normal operations.

I think it is a good suggestion that we do share this as a best practice with other licensees with similar operations as to the risk this might pose to operations and lessons learned for them to modify their protocols in anticipation of a possible -- hopefully not realized -- disruption to their future operations. So we'll take that suggestion and act on it.

**THE PRESIDENT:** Thank you.

Any other questions? If not, again, thank you all for your participation this morning. We'll take a 10-minute break and resume at 10:40. Thank you.

**MR. CUBBON:** Thank you.

--- Upon recessing at 10:40 /

Suspension à 10 h 40

--- Upon resuming at 10:41 a.m. /

Reprise à 10 h 41

**THE PRESIDENT:** The next item is an information item, to provide an update on the long-term management of Canada's used nuclear fuel as outlined in CMDs 2021-M17.1 and M17.1A.

The Nuclear Waste Management Organization



will make a presentation on the implementation of the Adaptive Phased Management, after which CNSC Staff will present an update on their role.

Before hearing the presentations, I want to acknowledge the participation from representatives from the Impact Assessment Agency of Canada and the CNSC's Independent Advisory Group as well as from Natural Resources Canada. They are available for questions after the presentations.

I'll turn the floor to Ms. Laurie Swami from NWMO for their presentation.

Ms. Swami, the floor is yours.

**CMD 21-M17.1/21-M17.1A**

**Oral presentation from the**

**Nuclear Waste Management Organization (NWMO)**

**MS. SWAMI:** Good morning, President Velshi and Commission Members. My name is Laurie Swami, President and CEO of the Nuclear Waste Management Organization.

Canada's plan for long-term management of used nuclear fuel was founded on dialogue with the indigenous peoples of Canada and with Canadians, and the shared values that arose through those discussions.

On a personal note, I have had the good

fortune to meet many indigenous peoples in our potential siting areas, on our Council of Elders and Youth and on the Advisory Council, and am thankful for their guidance and involvement as the NWMO implements our work, namely Adaptive Phased Management.

With me today are Mr. Bob Watts, Vice-President Indigenous Relations and Strategic Programs, Ms. Lise Morton, Vice-President Site Selection, as well as Dr. Ben Belfadhel, the former VP of Site Selection, who will be retiring at the end of April, Mr. Derek Wilson, Vice-President Construction and Projects, Ms. Lisa Frizzell, Vice-President Communications, and Mr. Allen Webster, Director, Regulatory Affairs and Environmental Assessment.

Next slide, please.

The purpose of our presentation today is to provide the Commission with an update on the NWMO's progress since our last appearance before the Commission in 2017 and our plans for the next few years.

I want to highlight three key aspects of Canada's plan.

It must be safe. The plan is based on the internationally accepted solution for disposal of used nuclear fuel, that is, a deep geological repository in a suitable rock formation that provides for the protection of

health and safety of people and the environment for generations to come. It will only proceed in an area with informed willing hosts based on partnerships between NWMO and the communities where we work.

We are proud and humbled to have been invited into communities and asked to work with them to learn more about how our project might fit within their vision for their communities.

It must be cost effective. Our program is fully funded by the nuclear waste operators, who have set aside funds to cover the work, from siting to design and construction to operation and eventually to final decommissioning and closure of the facility.

NWMO technical staff have and will continue to adopt innovative techniques to enhance safety and manage costs.

And today, we remain on track to make our site selection decision in 2023, and plan to initiate the regulatory approvals process in 2024 with the submission of our project description to the Impact Assessment Agency and site preparation licence application to the Canadian Nuclear Safety Commission.

Next slide, please.

So much of our progress is about people. The few of us here today represent our many devoted

colleagues, who are experts in their respective fields.

Our work is also built with the many people we routinely interact with in the potential siting communities.

One of the most important relationships we have is with indigenous peoples. We introduced a reconciliation policy. Every day, this enhances our internal culture and makes our project better for listening to the diverse perspectives brought to the table.

Pictured here is a virtual classroom for reconciliation training.

As you may recall, we started our site selection process in 2010. Twenty-two communities came forward to learn about the potential for becoming a host community. These communities did not have to raise their hand, but I am grateful that they did.

While many are no longer in the siting process, their participation and ongoing contributions enhanced our work.

By 2017, we had narrowed down the potential areas to nine, and early last year we reduced the remaining communities in the process to two, one in each of northwestern and southwestern Ontario.

Narrowing to two communities took hard work, but this achievement generated momentum inside the

NWMO. We've been able to launch a number of programs to get better understanding of the areas we are working in, developing partnerships, and understanding the environment and geology in the two areas.

It has also generated momentum in the communities we are working in. As our activities are increasing, so are the interests and requests from communities and, as expected, so is the scrutiny.

Like all Canadians, the NWMO and the communities we work with were impacted by COVID-19. Our momentum was impacted.

We adapted and adjusted our work to have staff work primarily from home. We implemented all COVID-19 protocols for those working in the communities, field locations or at our test facility. We instituted a number of measures during the pandemic intended to ensure our employees had the resources they needed to meet the challenges of the isolation.

One example that I'm particularly struck by is our sharing circles. Our human resources department partnered with our Indigenous Relations team to regularly offer sharing circles led by an elder from NWMO's Elder and Youth Council to support employee morale and mental health needs during the pandemic.

We also delayed field activities from 2020 into 2021, and I am very delighted that the work is now safely under way in both siting areas, enabling us to regain our momentum. And through all of this, I am proud that the NWMO was able to provide over \$800,000 dollars to support communities in Ontario last year.

Next slide, please.

One area of particular importance to me is our commitment to safety. In this picture, you can see our work site in northwestern Ontario where we provide safety signage in Ojibway.

Enhancing our current safety culture to a nuclear safety and security culture is an important aspect of becoming ready to transition from an organization that is focused on selection of a site to an organization that is ready to begin implementation.

Although we have always made sure our employees could work in a low-risk environment, whether in the field or in the office, recently we have been on a continuous improvement journey for our safety culture. While we are not yet at a point where we need to compare ourselves to the same nuclear safety and security culture measures and attributes used by nuclear organizations worldwide, in 2020 we began this process.

We conducted our first nuclear safety

culture assessment measuring ourselves against those standards. This evaluation told us some important strengths that we already have, and some areas that we need to focus on.

Safety leadership, accountability and integration of safety into our work program were all rated by the employees as relative strengths.

A learning organization was rated by the employees as an area for us to focus on.

I will now turn the presentation over to Mr. Watts.

**MR. WATTS:** Thank you.

For the record, I am Bob Watts, Vice-President, Indigenous Relations and Strategic Programs.

As an organization, the NWMO is focused on our people. We have an incredibly skilled and dedicated workforce that will see us through our site selection and into the regulatory approvals process. This workforce will transition to the selected site.

As a key factor in our success, we will be creating a welcoming workplace that respects the diversity of our employees and ensures that we treat individuals with equity. Another factor in our success is reaching out to today's youth and giving them assistance in their

education, including opportunities for experience in the NWMO.

We have had training across our organization to introduce diversity to our employees and to raise their awareness of inherent bias. This training, provided by the Canadian Centre for Diversity and Inclusion, has been well received by our employees. Personally, I have found it to be a valuable means of creating the conversations that need to occur as we strive to build an open, equitable and diverse workplace.

We have also established an internal Diversity and Inclusion Committee. This Committee is focused on how we can improve the understanding of employment equity and diversity as well as finding ways we can celebrate the diversity of our employees.

Combining our goals on diversity with our goals on development of the future generations who may become involved in this project is included in our university scholarships and grants programs. We structure our scholarships to ensure women and indigenous students studying STEM subjects can get a helping hand. This is just part of our program to foster STEM learning from elementary through to university education.

We have a successful student employment program that provides both summer positions as well as



internships and work co-operative programs. The young people we bring into our organization have provided us with new perspectives and many ideas on how we can better involve youth as we move forward.

Next page, please.

In late 2019, the NWMO released our Reconciliation Policy setting out how we will contribute to reconciliation in all of our work. Following the policy, the NWMO will continue to meaningfully engage with First Nation, Métis and municipal communities and organizations as we work to implement Canada's plan.

The NWMO will continue to recognize the truth of historic wrongs, the challenges we have today and seek opportunities to co-create a better future. The policy requires that the NWMO will build relationships with First Nation and Métis communities on a foundation of respect for languages and customs, culture and institutions.

Additionally, we will work with communities to support reconciliation opportunities in their areas.

We have created an assessment tool to look at corporate policies and procedures. Additionally, many of our contracts, workplans and publications are examined through a reconciliation lens to identify opportunities for

improvement.

This assessment tool is aiding in our efforts to ensure reconciliation is at the foundation of our actions. We are proud that the assessment tool we have developed is being adopted by other organizations.

Next slide, please.

NWMO technical experts and research partners come together with indigenous scientists and knowledge keepers each year to explore how we continue to interweave indigenous knowledge into our technical research programs. These workshops create collaboration on a national and international basis by bringing together scientists and indigenous knowledge keepers to address the safe and secure containment of Canada's used nuclear fuel over the long term.

One of the focus topics for integration of indigenous knowledge and western science is water. The NWMO now has a deeper understanding of the spiritual importance of water. Water sustains life, and this is a subject of vital importance to all people.

Several communities in our site selection process have asked us to provide more information about how our project will protect water. We have developed, with input from indigenous communities, three presentations that explore the relationship between water, clay and copper

which incorporate indigenous teachings and use oral tradition as part of how they are delivered.

For the duration of our work, we will continue to find opportunities to interweave indigenous knowledge into everything we do and create space to learn from ceremony and apply those teachings to how decisions are made at the NWMO.

I will now turn over to Ms. Morton to provide an update on our progress on site selection.

Next slide, please.

**MS. MORTON:** Thank you.

For the record, I am Lise Morton, Vice-President, Site Selection.

Adaptive Phased Management involves an open process by which communities were invited to express their interest in learning about the project.

The process for selecting a site involves studies and dialogue to build a willing community and confidence that a strong partnership can be developed with the interested municipality, First Nation and Métis communities in the area and surrounding communities, confidence a deep geological repository can be developed with a strong safety case at that location, and confidence a safe, secure and socially accepted transportation plan can be developed.

In the last few years, we have completed our narrowing evaluations to focus our attention on two siting areas. These siting areas had for us the highest potential for suitable geology and, therefore, to meet the safety criteria, and the potential for partnership.

The NWMO approach is to achieve partnership with the host communities. For us, this means that after site selection, the NWMO and the host communities will be partners working together to seek the regulatory approvals and move forward side by side through the Impact Assessment. We also envision that they will have a lasting role in decision-making to help ensure the project contributes to the long-term sustainability and well-being of their communities.

Next slide, please.

Although Canada's used nuclear fuel will not be transported to the selected site until the 2040s, in response to public feedback, the NWMO has work already under way to ensure transportation will be safe and secure, with a plan that is aligned with these key public priorities.

NWMO's transportation program will meet or exceed regulatory requirements and international standards and will include program elements such as a robustly designed, rigorously tested and certified transportation

package, highly trained and qualified workers and vehicle operators, safe operating practices including approved routes and protocols for weather and road conditions, training and joint exercises with provincial and community emergency responders, and periodic reviews and audits and a continuous improvement process.

We are committed to working with the public, now and in the future, to inform and engage them during the planning and operating phases of our program.

Next slide, please.

In 2020, the NWMO published a draft transportation framework. This framework summarizes priorities Canadians have identified related to the transportation of used nuclear fuel and outlined a proposed approach to collaborative transportation planning based on those priorities. The framework was developed following more than 1,000 conversations with communities and those interested in Canada's plan, and it was shared publicly for broader engagement and refinement.

We understand that indigenous voices are critical to transportation planning. Applying a reconciliation lens to this work will help us to fully understand how planning can be implemented in a way that takes into account indigenous priorities.

As we continue to discuss transportation

with Canadians, we will refine and enhance our framework and transportation plans.

Next slide, please.

From the very beginning, the NWMO made a commitment that the project will only proceed with the involvement of municipal and indigenous communities in the area and surrounding communities, working in partnership to implement it. We have been very clear that the project will only be sited in a community that is informed and willing.

Communities have shared with us their questions and concerns related to the project. They also shared with us their aspirations and vision regarding how the project can enhance their well-being considering the many lenses of sustainability.

We are working collaboratively with the communities to explore the potential for supportive and resilient partnerships, through engaging with community members to increase awareness and understanding of the project and of the safety case, implementing studies and work programs to address their questions and concerns, demonstrating that the project will enhance the well-being of the potential host communities in a manner that is consistent with the vision they have for themselves, seeking a compelling demonstration of willingness, and

reaching mutual hosting agreements.

Communities are beginning to reflect on the process they will use to determine their level of willingness to host the project. We will be working with them to understand and support those processes as they move forward.

I will now turn over to Derek Wilson.

**MR. WILSON:** Thank you.

For the record, I am Derek Wilson, Vice-President of Construction and Projects.

This slide illustrates our conceptual design for the deep geological repository. It includes surface facilities as illustrated at the bottom of the slide, including the used fuel packaging plant, vertical shafts to provide access to the repository, an underground demonstration and services area at the base of the shafts, access tunnels and placement rooms for the used fuel containers, and a rock pile at the surface.

We are several years into a program to design and evaluate the engineered barrier system that will form part of the multiple barriers. The system is comprised of a purpose-built container constructed of carbon steel for strength and coated with copper to provide long-term corrosion protection.

The container is encased in highly

compacted bentonite, called the buffer box, to limit microbial corrosion effects on the container. The container and buffer box are placed in the rooms, and voids between the buffer boxes and the rock are filled with bentonite pellets.

We have fabricated system components, purpose-built equipment and inspection processes, and are developing the ability to produce these on an ongoing basis with the level of quality required. One of the areas in which we are particularly focused upon is the copper coating on the container. We are working with leading industry experts on optimizing this process.

We have also undertaken leading edge research to confirm that the engineered barrier system will perform as needed over the post-closure period to satisfy our safety case. Our team and partners have published findings in peer reviewed technical journals and are contributing to the international understanding of materials behaviour in a repository setting.

Next slide, please.

The NWMO is conducting geoscientific and environmental investigations at both of the potential siting areas.

In the northwest, we have borehole drilling and subsurface investigations under way. We have



conducted 2D seismic surveys and also started micro-seismic monitoring of the proposed site and surrounding region.

The information that we are collecting at the potential site will be used to support our understanding of the suitability of the area to meet the safety requirements for the repository.

In the southwest, we are exploring a geology that has already been extensively investigated. This year we are installing two boreholes and shallow groundwater well network to confirm our understanding of the geology in the region applies to the potential site.

Following site selection, the NWMO will undertake detailed site characterization at the selected site to support the completion of the safety case and meet regulatory requirements.

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Later this year in the northwest, we will also start our investigations of the shallow groundwater system through the establishment of the groundwater well network and the collection of other information that will assist us in characterizing the natural environment. We will be able to draw conclusions about the potential environmental effects that we would have should we develop the site.

In the southwest, we will also continue to

collect environmental information that will help us make the decision about the potential suitability of that site.

Next slide, please.

Later this year and into next, we will complete our fabrication and testing of the handling and placement equipment of the engineered barrier system. At our Oakville test facility, we have built a mock-up of the emplacement room.

We will undertake the steps for the placement of the used fuel container into the bentonite buffer box, and then remotely position them into the emplacement room. This will be repeated for a number of containers and we will then fill in the gap spaces with bentonite. This will give us the confidence that we have the tools and systems we need to be able to place the used fuel in the eventual repository.

We also have an active and ongoing research program. Working with universities in Canada and internationally, we are funding research in biological, chemical and physical sciences as well as an array of engineering programs.

Next slide, please.

Concurrent with our site investigations and engineered barrier system testing and demonstration, we are undertaking safety assessments. We are preparing

generic safety assessments for the pre-closure or operating period and analyzing the impacts of potential accidents arising during operations. These will help us in the design of the facilities such that radiation protection objectives for our workers and for the public can be met.

We have published generic post-closure or long-term safety cases for both crystalline and sedimentary rock environments such as the potential sites that we are investigating in the northwest and southwest, respectively. These generic safety assessments consider the normal or expected conditions of the repository over the long term as well as "what if" or disruptive scenarios.

These case studies confirmed that, even with conservative assumptions and considering disruptive scenarios, that we can achieve the limits that have been established to protect the public from the effects of the used fuel.

We are now preparing site specific safety analyses using the information collected as part of our site investigations. This will be an iterative process, with annual updates to incorporate the latest understanding of the sites and the facility design. While we will not have a full safety case at the time of site selection, we will have a level of confidence that we will be able to deliver a safety case following detailed site

characterization at the selected site.

Next slide, please.

With over 10 years of dialogue and studies completed, the NWMO will be ready to start the regulatory approvals process shortly after the site selection decision. The site characterization information that we are collecting and the studies that we are undertaking as part of site selection will provide a good basis for the launch of the regulatory reviews in late 2024 with the Impact Assessment and a Licence to Prepare Site application.

For planning purposes, we have assumed that the recommendations of the Review Panel will be accepted by the federal government by 2028.

With a positive decision on the impact assessment, site preparation activities could begin and the NWMO could submit its application for a construction licence in 2029. This would allow construction to begin in 2033 and operations in the early 2040s.

We have an active pre-licensing dialogue with CNSC Staff pursuant to the Special Project Arrangement that has been established. This is helping the NWMO ensure that the work we are undertaking today will meet the future expectations for information that will be reviewed as part of the licensing process.

Next slide, please.

Looking forward, the NWMO will need to transition from an organization that has been focused on selecting a site to an organization focused on project implementation. Our mobilization strategy will ensure we have the resources, systems and infrastructure for the work following site selection. This includes planning for a Centre of Expertise, which will be one of the first facilities located in the siting area.

One focus area is updating our management system to ensure we meet the expectations the CNSC hold for a licensee, including conformance with the requirements of CSA N286-12, Management System Requirements for Nuclear Facilities.

We have strengthened our continuous learning and improvement program by launching a refreshed program at the end of last year which we call "CLIP". We also looked at the program through the lens of our Reconciliation Assessment Tool, considering and incorporating traditional indigenous knowledge and interweaving it with new world views.

Through this refresh, NWMO leadership has shown that we encourage all employees to demonstrate the questioning attitude that will improve the safety, efficiency and effectiveness of our operations.

As we get closer to the start of the regulatory approvals process, we will invite CNSC Staff to conduct an inspection of our programs and provide their recommendations on areas that could be improved in advance of the NWMO becoming a licensee.

I will now turn over to Ms. Frizzell to provide an update on what we're hearing from Canadians.

Next slide, please.

**MS. FRIZZELL:** Thank you.

For the record, I am Lisa Frizzell, Vice-President Communications.

The NWMO is an open and transparent organization, and we work hard to keep the public informed about Canada's plan and our activities and we actively monitor public questions, comments and sentiment on an ongoing basis. This helps us make sure that our communications are effective in providing the information that people are seeking as they wish to learn about our project.

We monitor public sentiment through a number of mechanisms. These include engagement with a wide range of audiences in siting areas, public attitude research, monitoring and engaging in online dialogue, and monitoring media coverage.

Most recently in the South Bruce siting

area, Bruce Power conducted a poll that showed a majority of residents in the region surrounding the potential repository were in favour of continuing with the site selection process.

In the Ignace siting area, we've also seen ongoing support within the region to sustain the dialogue.

We've also seen interest in the project grow as we close in on site selection and, understandably, we continue to hear a diversity of views, so every day we're focused on addressing the questions and concerns we hear from the public to make sure communities have the information they need when the time comes to decide if this project is a fit for their area.

We also regularly invite public comment and input into our work. This input helps shape the work and it also gives us additional insight into public sentiment, as well as the questions and concerns we need to address in the information we share across our many communications platforms.

For example, we currently have a survey open to anyone who is interested to comment on our five-year strategic plan, which we published in March. And last year we invited comment on our draft transportation framework.

Next slide, please

The *Nuclear Fuel Waste Act* establishes oversight of the NWMO program through our reporting to the Federal Minister of Natural Resources and through the legislated Advisory Council.

Beyond that, we have a number of other important committees and groups that provide advice and guidance about how best to execute our project. They provide us with invaluable insights and help us to continuously strengthen our program.

For example, included is a Council of Elders and Youth who advise us about respectful engagement of Indigenous people and how to interweave Indigenous Knowledge into our work.

Also, knowing how important the geology will be to our safety case, we have a Geoscientific Review Group made up of internationally recognized experts who are helping us develop our understanding of the geology of the potential sites.

And looking to our siting regions, we work with local Community Liaison Committees. These committees were set up by municipal councils, they are independent of the NWMO, and they are made up of residents from the area committed to helping community members learn more about Canada's plan. These working groups are extremely vocal in ensuring we know what questions and concerns people in the



community are raising and that we need to address in order for them to make an informed choice about the project. They also provide important guidance and feedback about how we can best work with the people who live in the area to get them the information they need.

And of course in addition to all the guidance we receive from experts, communities are also undertaking their own studies to make sure they are comfortable with the aspects of the project most important to them.

Next slide, please.

The NWMO also collaborates with other national and international agencies, including the ones shown on this slide.

We maintain co-operation agreements with international counterparts in Belgium, France, Finland, Japan, Sweden, South Korea, Switzerland and the United Kingdom. The agreements help make sure we are considering international best practices as well as sharing our own experiences as we implement Canada's plan.

We actively exchange information on materials science, geoscience and impact assessment and continue to hold virtual discussions with our international peers.

We are particularly involved with those

organizations operating underground research laboratory experiments, such as the Mont Terri Project and Grimsel Test Site in Switzerland, as well as the Äspö Hard Rock Laboratory in Sweden.

We are also an active participant in Finland's Full-Scale emplacement demonstration at their repository, which is under construction and expected to begin operations in the next few years. Finland is the country that is the furthest ahead in developing and implementing their deep geological repository for used nuclear fuel.

Taking part in programs like these ensures we capture all of the latest research and development in our program and benefit from those programs that are advancing ahead of ours.

We are also active in technical working groups within the Nuclear Energy Agency of the OECD and with the IAEA.

Next slide, please.

Before concluding, as the Commission is likely aware, in November 2020 the Minister of Natural Resources Canada asked the NWMO to lead discussions about an integrated strategy for the safe long-term management of all Canada's radioactive waste.

The NWMO was selected in part to leverage

our almost 20 years of recognized expertise in the engagement of Canadians and Indigenous peoples on plans for the safe long-term management of used nuclear fuel. This work is running in parallel with Adaptive Phased Management and does not alter our current implementation mandate.

As an example of the work we are doing in this area, a Canadian Radioactive Waste Summit was held a few weeks ago. This virtual event launched the engagement process for the development of the Integrated Strategy for Radioactive Waste.

We were pleased to hear from diverse voices on a variety of topics that will be considered in the development of Canada's strategy. There were sessions geared to youth, Indigenous peoples, industry, civil society organizations, academia, knowledge specialists in the waste field, and interested Canadians in general.

I will now turn it over to Ms. Swami to conclude our presentation.

Next slide, please.

**MS. SWAMI:** Laurie Swami, for the record.

As the NWMO prepares to select the final repository location and enter the regulatory process, we continue to make good progress.

We are working with potential communities on the site selection process, including discussions on

partnership;

We are pursuing site characterization, design, safety and environmental assessments to develop the safety case for the repository; and

We are undertaking technical and engagement activities on the transport of used nuclear fuel, including the development of a transportation planning framework in collaboration with Canadians.

All of the progress we have discussed with you today would not have been possible without people: our dedicated and skilled staff and the many people in communities that started in the site selection process and those that continue to work with us today to safely implement one of the largest environmental infrastructure projects in Canada.

Thank you. We would be pleased to answer any questions the Commission Members may have.

**THE PRESIDENT:** Thank you very much.

I will now turn the floor to CNSC staff for their presentation, as outlined in CMD 21-M17.

Ms. Murthy, over to you, please.

**CMD 21-M17**

**Oral presentation by CNSC staff**

**MS. MURTHY:** Thank you.

Good morning, President Velshi and Members of the Commission. My name is Kavita Murthy and I am the Director General of the Directorate of Nuclear Cycle and Facilities Regulation at the CNSC.

Can I have the first slide, please?

Just give us a minute.

--- Pause

**MS. MURTHY:** There it is, okay. Thank you, Pam.

Today we are here to provide you an update on CNSC staff's role in the Nuclear Waste Management Organization's, or NWMO, Adaptive Phased Management initiative. This initiative aims to establish a Deep Geological Repository for Canada's used nuclear fuel. We will highlight CNSC staff's activities that demonstrate our preparedness to assess submissions from the NWMO on their project and highlight the next steps.

I am going to begin today by drawing your attention to the background we have used on this slide. It is a photograph of marble bedrock sculpted by glacial meltwater at the Cantley quarry just north of Ottawa. CNSC

staff have brought participants in international working groups on deep geological repositories to this site because it illustrates the relevance of glacial erosion to long-term performance assessments of DGRs in Canada and in other northern countries. It also foreshadows some of the international and research activities that we will present on today.

With me today from the Wastes and Decommissioning Division are: Mr. Patrick Burton, Acting Director; Dr. Julie Brown, Senior Project Officer; Jocelyn Truong and Julia Smith, Project Officers; and Pamela Doughty, Senior Project Officer, who will be retiring from the CNSC this summer after 20 years of service and who for the last three years has been the CNSC's project lead on this initiative on this work.

As well, we have other CNSC specialists who are tasked with this file prepared to answer any questions that you may have.

This slide provides updates -- provides information on previous updates provided by CNSC staff to the Commission on our early involvement in the NWMO's Adaptive Phased Management, or APM, initiative.

While most of these updates focus solely on this topic, please note that in December 2016 the update was provided as part of the 2015 Regulatory Oversight

Report for Waste Management, Storage and Processing in Canada. The most recent update was in 2017.

I will now turn the presentation over to Mr. Patrick Burton.

**MR. BURTON:** Thank you.

My name is Patrick Burton and I am the Acting Director of the Wastes and Decommissioning Division.

In today's update we will briefly outline the NWMO's APM initiative from CNSC staff's point of view, before describing our activities in this pre-licensing period.

I will begin by providing some context on CNSC staff's roles throughout the NWMO's DGR project.

This slide shows the anticipated timeline for the NWMO's APM project, with the present day shown by the gold star and the NWMO's past site selection work in the blue arrow on the left. The site selection process is not a regulated activity under the *Nuclear Safety and Control Act*, or *NSCA*, and CNSC's involvement up to present has consisted of the pre-licensing activities that are the subject of this presentation.

Currently, the NWMO plans to select their preferred DGR site in 2023 and to submit an application to the CNSC for a licence to prepare site for a Class 1B facility in 2024. CNSC staff consider these to be

prospective dates. Given that used nuclear fuel is all currently in safe interim storage and can stay there for decades to come, CNSC staff are not concerned if these dates are delayed, even by years.

You will note that in contrast to the NWMO's timeline slide, there are no dates in the dark blue arrow on the right. That is because on receipt of a licence application, CNSC staff will take whatever time is necessary to ensure that the activities proposed in the application will be safe.

Typically, it takes decades for national-level DGR projects to evolve from the conceptual stage to implementation, consistent with the timeline on the left-hand side of this slide.

This reinforces the importance of early regulatory involvement. Ultimately, the objective of CNSC staff's activities during this pre-licensing period is to ensure that we are prepared to receive an application for a licence to prepare site from the NWMO and that the NWMO is prepared to submit a quality application.

The pre-licensing period also allows CNSC staff the necessary time to build awareness and trust in local communities.

Under the current federal regulatory process, the NWMO's APM project will be subject to an



impact assessment under the *Impact Assessment Act*, or *IAA*.

Nuclear projects to be assessed under the *IAA* are subject to an integrated impact assessment, which means having a single assessment process with the shared objective that the requirements of both the *IAA* and the *NSCA* are discharged under one assessment. This is the "one project, one assessment" principle.

An integrated impact assessment would be led by the Impact Assessment Agency of Canada, working collaboratively with the CNSC to ensure the reviews are conducted in an efficient and effective manner without unnecessary duplication of effort.

Currently, the NWMO is expected to submit both an impact assessment project description under the *IAA* and an application for a licence to prepare site under the *NSCA* in 2024.

Key activities that CNSC staff have undertaken to prepare for the APM under the *IAA* include:

- establishing a Memorandum of Understanding with the Impact Assessment Agency of Canada to ensure roles and responsibilities are clearly articulated;

- updating REGDOC-2.9.1 "Environmental Principles, Assessments and Protection Measures" to reflect the coming into force of the *IAA*; and

- establishing ongoing discussions on the APM project between the CNSC, the Impact Assessment Agency of Canada and the NWMO.

I will now pass the presentation over to Ms. Jocelyn Truong.

**MS. TRUONG:** Thank you.

My name is Jocelyn Truong and I am a Project Officer in the Wastes and Decommissioning Division.

In this part of the presentation, I will provide an update on CNSC staff's outreach and engagement activities at this pre-licensing stage. CNSC staff consider our early outreach and engagement activities as important as our work building our scientific and technical capacity. Our early engagement aims to build trust and strong relationships, in addition to fulfilling our mandate to disseminate objective scientific, technical and regulatory information to the public.

Since 2010, CNSC staff have been conducting outreach and engagement activities in communities that have formally entered NWMO's site selection process.

It is NWMO's responsibility to determine a willing and informed host community and suitable host geology for the project.

CNSC's outreach activities prior to a

submission of a licence application serve to explain our regulatory role and to build relationships with the communities. Since the last Commission update, CNSC has conducted over 30 outreach and engagement activities in person and virtually.

Outreach is conducted at the request of community representatives and as part of planning CNSC staff discuss the format of outreach and specific topics that are of interest.

CNSC staff have presented to public Community Liaison Committee, or CLC, meetings, local schools, local fairs, held open houses and, more recently, through online platforms.

As the project has progressed and site options have narrowed down, we have received an increase in numbers of requests for CNSC outreach and have expanded to neighbouring communities.

CNSC staff also meet with First Nations and Métis communities and I will discuss this more in the next slide.

CNSC staff are developing a structured, transparent, formalized approach to ongoing engagement with Indigenous communities.

Building relationships with First Nations and Métis communities who may have an interest in learning

more about the APM initiative is a priority to the CNSC.

As building strong relationships based on trust and mutual respect takes time, CNSC staff have initiated engagement early in the pre-licensing phase.

When an outreach event is planned in a given area, CNSC staff reach out directly to nearby First Nations and Métis communities to offer one-on-one meetings in their communities to provide information about the CNSC and its role as Canada's independent nuclear regulator.

In our meetings, CNSC staff provide information about our early role in the APM process and we learn more about each community we engage.

CNSC staff have conducted 17 in-person outreach activities from 2018 to 2019. This slide provides highlights for some of the outreach activities that were conducted:

- CNSC staff hosted a youth group from the Aboriginal Peoples of Wabigoon in Ottawa with presentations and hands-on demonstrations of radiation protection and geology;

- CNSC staff visited schools in the South Bruce and Huron Kinloss areas to provide a presentation on radiation fundamentals;

- For the past five years CNSC staff have been invited to attend Wabigoon Lake Ojibway Nation's

Learning and Sharing Gatherings to explain our role and approach to Indigenous engagement. We attended two learning and sharing gatherings in 2018 and 2019;

- Lastly, we continued to present CNSC's regulatory role to Community Liaison, or CLC, meetings when requested and we presented to six of these meetings in 2018 and 2019.

The CNSC continues to build relationships with the two communities remaining in the site selection process, both Ignace and South Bruce.

The COVID-19 pandemic has shifted our outreach to the virtual world, and since the start of the pandemic we have conducted seven outreach activities virtually.

Highlights have included:

- a virtual presentation on radiation fundamentals to a school in the South Bruce area, as shown in the picture on the right of Julie Burt, Radiation Biologist at the CNSC;

- Outreach presentations to South Bruce and Ignace CLC; and

- In lieu of an in-person open house, we conducted a meet the regulator webinar with the South Bruce CLC, where we brought many CNSC subject matter experts to answer community questions.

In late 2020 we reached out to all interested First Nations and Métis communities in both regions to offer a virtual touch-base to ensure that we can continue the dialogue and maintain relationships during these challenging times. Presently we have met with Grand Council Treaty 3, Wabigoon Lake Ojibway Nation, Aboriginal Peoples of Wabigoon, and MNO Region 1 in the Ignace area, Saugeen Ojibway Nation, Historic Saugeen Métis and Métis Nation of Ontario Region 7 in the South Bruce regions. We expect these meetings to continue this year.

The following is a snapshot of common topics of interest and questions raised during outreach activities. Please note this is not an exhaustive list.

Common topics include the role of the CNSC, the CNSC licensing process, and how the public, First Nations and Métis communities can participate in these processes.

In order for members of the public to have an understanding of radiation, CNSC staff explain what radiation is and how workers, the public and the environment are protected.

Members of the public often ask about repository safety, for example: What if something goes wrong and how will safety be ensured?

We have also been asked questions related

to Indigenous Consultation, Indigenous knowledge, Free and Prior Informed Consent, and responsibilities for Duty to Consult and Accommodate when a licence application is submitted.

Questions are also asked about benchmarking, specifically how Canada's approach aligns with what other countries are doing.

Finally, there are questions on the transportation of used nuclear fuel, emergency preparedness and security.

As we are currently conducting outreach virtually, CNSC staff have found innovative ways to demonstrate current waste management practices. For example, the photo on the bottom right shows Julia Smith with models, 3D models she created using CNSC's 3D printer.

Discussions around management of radioactive waste can be challenging and it takes time to build relationships.

This slide shows some of the challenges and how we have used them to help us improve how we do our outreach.

We have repeatedly heard that we need to clearly define CNSC's roles and responsibilities as independent from the NWMO's; that we are not here to promote the project but to ensure safety if an application

is received in the future.

We have heard that some of our technical communications material needs to be accessible to all audiences, and so we continue working to improve our tools and techniques for communicating technical information.

Another challenge we have encountered is explaining that the project is currently in the pre-licensing and site selection stage, which is not a regulated activity under the NSCA. As such, there is no formal consultation at this point, so we must clearly explain why we are conducting early engagement and when the formal regulatory process would be triggered.

Finally, the virtual format presents its own challenges as many communities have expressed an appreciation for meeting CNSC subject matter experts and ask them questions in informal and face-to-face settings.

This slide presents some lessons learned.

While there are challenges, overall feedback from outreach activities is positive.

People are glad to hear that there is a lifecycle regulator that will be present throughout the entire lifecycle of a nuclear facility.

Providing technical and scientific information that is accessible to a variety of audiences helps to build public confidence in CNSC's regulatory



capacity.

We will continue to bring CNSC specialists to outreach events. For example, CNSC inspectors are able to explain their compliance and enforcement activities at licensed nuclear facilities and CNSC subject matter experts are able to explain how they carry out technical reviews.

Finally, outreach activities allow staff to understand the general concerns and to start to establish relationships with the public, First Nations and Métis communities.

At this time we continue to seek the feedback on how we can improve our engagement activities and continue to learn from the communities as the project progresses.

Next, I will pass the presentation over to Dr. Julie Brown.

**DR. BROWN:** Thank you.

My name is Julie Brown, I am a Senior Project Officer in the Wastes and Decommissioning Division.

To build our in-house knowledge and ensure we are prepared to evaluate future licensing submissions on deep geological repositories, we are involved in several international working groups and have an independent research program.

International collaboration forms an

important component of CNSC staff's pre-licensing activities. CNSC belongs to a number of international groups that exchange information and knowledge about DGRs. These platforms allow CNSC staff to remain up to date on the latest scientific advancements and developments of international DGR programs. This slide lists those platforms under the umbrella of the International Atomic Energy Agency.

Recently, in February and early March of this year, several CNSC staff participated in the first virtual meeting of the IAEA Underground Research Facility Network. Several CNSC staff members from the waste and decommissioning division are depicted in this photo, as well as Dr. Grant Su, a CNSC specialist in geotechnical engineering, who also leads CNSC's research on bentonite performance.

This network is a platform to assess and share best practices in developing, evaluating, and implementing geological disposal and emphasizes the role and use of underground research facilities to support the successful implementation of geological disposal programs.

One of the benefits of this year's online format was that several CNSC staff representatives were able to attend the meeting, which allowed for the participation of senior and technical staff while enabling

newer staff to observe, attend, and become involved in the working of the group, something that was only possible because of the virtual format.

CNSC staff participate in other international collaboration platforms listed on this slide. The Nuclear Energy Agency's Integration Group for the Safety Case works to establish and document the technical and scientific basis for developing and reviewing safety cases for geological disposal.

The CNSC also has bilateral agreements with the Swiss nuclear regulator ENSI and France's IRSN on topics related to the regulation of national DGRs and research.

DECOVALEX is an international research and model comparison collaboration that is focused on simulating processes relevant for DGR projects, and I will show an example of staff's modelling work a little bit later on in the presentation.

Last on this slide, CNSC is a member of the SITEX network, which consists of regulators, technical support organizations, research entities, and civil society organizations and functions independently from implementing organizations.

I will highlight one other forum, the DGR Regulators Forum, DGRRF, which is a working group of

regulators from Canada, Finland, France, Sweden, Switzerland, and the United States. This platform was created to share information and experience about the licensing process of deep geological repositories. Workshops have included valuable opportunities to visit research facilities, as illustrated in the pictures on this slide which show the DGRRF working group in front of a tunnelling experiment in the Bure underground research facility in France, done to test excavation methods. The lower photo shows some experimental construction and sealing material.

This table provides a snapshot of the status of national disposal projects for countries that are members of the DGRRF. Many have underground research facilities, or URFs. Canada does not currently have an operating URF. The four in-person workshops to date have focused on a range of topics including regulatory frameworks for DGRs, the development of review and inspection programs for different licensing stages, and regulatory review processes for research and development programs.

The CNSC has been carrying out research on DGRs since 1978. CNSC currently has a strategic research agenda specific for DGRs. Our strategic research agenda provides a framework to identify and justify research needs

associated with the future review of a licence application for a geological disposal facility. In meeting this objective, the agenda ensures that research activities are undertaken to support the review of a post-closure safety case, to make scientifically informed recommendations to the Commission, and to support the conduct of regulatory oversight activities such as technical reviews.

Secondary objectives of the strategic research agenda include promoting long-term knowledge management and knowledge transfer, and it also provides a clear and transparent communication tool for CNSC research activities related to DGRs.

CNSC's independent advisory group, or IAG, was founded in 2015 to provide objective, independent advice to CNSC staff on geoscience aspects of the NWMO's APM initiative. The IAG consists of six Canadian geoscientists who are recognized for the expertise in their respective disciplines, which are relevant for the current stage of the NWMO's APM.

The IAG's activities currently include reviewing CNSC's independent research program on deep geological repositories, reviewing NWMO documents related to their research and development program, and attending the NWMO's annual geoscience seminar.

Dr. Paul Van Geel is the current chair of

the IAG. He is a professor of environmental engineering at Carleton University, and he is representing the IAG at today's meeting.

This is an illustration of CNSC's DGR research program. Research projects focus on the safety of geological disposal and investigate geological analogues or the natural barrier; the engineered barrier performance, using data from experiment in underground research facilities and other laboratories; and the development of safety assessment tools.

Research areas, shown in the centre, investigate aspects of DGR barrier performance, including the natural geological barrier and the engineered barrier. These projects consider the impact of perturbations such as glaciation on barrier performance and are undertaken to ensure the protection of people and the environment. The results inform regulatory reviews, build in-house knowledge, and form the basis of publications that are shared with the scientific community and the public.

This is a list of our current and planned DGR research project topics. Most of the projects listed are carried out collaboratively with colleagues at Canadian universities or through international collaborations. Sometimes, CNSC staff directly co-supervise graduate students or post-docs undertaking the research.

Over the next four slides, I will describe examples of current research projects highlighted in blue on this list, beginning with CNSC research on gas migration, and afterward will explain what a natural analogue is and why we study them.

This first example of current research focuses on the engineered barrier system. Some of this research was part of CNSC staff member Dr. Elias Dagher's Pd.D. thesis completed at the University of Ottawa. His thesis was co-supervised by another CNSC staff member, Dr. Son Nguyen. This topic is also an example of an international collaboration, where information from experiments, including underground research facilities, are used to inform models of long-term barrier system performance that are developed by CNSC staff.

CNSC has been working to understand the impact of gases that may be generated from corrosion of metallic materials in the engineered barrier system or from radioactive decay of the waste. This particular project is looking to understand gas migration and the formation of preferential flow pathways through sealing material. The animation shows flow through a sample of bentonite, the sealing material in the engineered barrier system. These processes are investigated because of the potential to impact the engineered barrier system performance and

provide a potential pathway for transport of contaminants to the biosphere.

Natural analogues are another area of current research that I will now describe. First of all, what is a natural analogue? Why do we study them?

A natural, usually geological, analogue represents one or more parts of a DGR. They are useful because they provide us with information on the time frames and spatial scales associated with a DGR system, and this information can be used to inform models of long-term DGR performance. Natural analogues are often used to illustrate DGR concepts to a variety of audiences.

One example of a well-studied natural analogue is the Cigar Lake uranium deposit in northern Saskatchewan. The uranium ore body formed over a billion years ago, and there is no trace of the ore body at surface. It remained undiscovered until relatively recently with the advent of modern exploration techniques. It is the most uranium-rich uranium deposit on Earth, and it represents different parts of a DGR system, as illustrated on this slide. The uranium represents the used nuclear fuel. The location of the radioactive material at a depth of several hundred metres within bedrock is similar to the depth of waste emplacement rooms in a DGR. Clay material surrounding the uranium deposit is similar to



components of the engineered barrier system.

A current CNSC research project involves revisiting Cigar Lake as an analogue, using recently developed techniques to investigate radionuclide migration in the geosphere surrounding the orebody. This project, led by CNSC staff member Dr. Matt Herod, is a collaboration with the University of Ottawa. The results of this research will provide new information about radionuclide migration over the geologically long time frames associated with DGR safety.

This project is a collaboration with the University of Manitoba and the topic of a Ph.D. project that I am co-supervising. This is a natural analogue study of the Kiggavik uranium deposits from Nunavut to study the migration of uranium and other radionuclides over large spatial and temporal scales in a fractured host rock in the Arctic. The geological setting for this uranium deposit contrasts with that of Cigar Lake as this uranium deposit extends almost to the surface, providing a less idealized analogue that would be potentially more similar to a DGR that was subject to intense glacial erosion.

The illustration shows a cross-section through the Kiggavik main zone uranium deposit, where paler pink is crystalline rock, and grey is a sedimentary host rock. The dark pink shows where the uranium mineralization

is located within both rock types, and it's shown to extend from the surface to a depth of around 200 metres. Early results have identified different types and generations of uranium mineralization, illustrated on the next slide.

The examples provided in these photos are from Ian Burron's Ph.D. work so far, illustrating the styles of mineralization that have been identified to date. On the left, photos of drill core samples show the locations of alteration zones and uranium mineralization. On the right are scanning electron microscope photomicrographs identifying different generations of uranium mineralization.

Work is continuing to decipher the composition of the fluids that correlate to the uranium remobilization events and the actual timing for those remobilization events.

The ultimate outcome will be a new Canadian natural analogue, which will complement and contrast the Cigar Lake analogue work and also provide information that can be used to inform the development of long-term models of processes relevant for DGRs -- and, in fact, this is already being done by CNSC staff.

I will now pass the presentation to Ms. Julia Smith.

**MS. SMITH:** Hello. My name is Julia

Smith. I am a project officer in the Wastes and Decommissioning Division.

CNSC has a regulatory framework for dealing with radioactive waste that is relevant for DGRs. The CNSC's regulatory framework consists of the elements shown on this slide, starting at the top with our enabling legislation, the *Nuclear Safety and Control Act*.

Within the second tier, regulations set out high-level legal requirements that licensees or applicants must meet in order to obtain or retain a licence. Note that the NWMO's proposed operation would be a Class IB facility under the CNSC's regulations, and this means that a wide variety of requirements across all of the CNSC's safety and control areas will apply.

Referring to the third tier, the CNSC issues licences and certificates with facility or activity-specific requirements that permit licensees to operate. This includes activities related to waste management, which is one of the CNSC's safety and control areas.

At the base of the framework, regulatory documents and accredited standards such as those published by the CSA group -- a not-for-profit organization that manages the process in which CSA standards are developed -- provide more detail than regulations and serve to clarify

CNSC requirements and provide guidance as to how requirements may be met.

A list of regulatory documents and CSA standards focus on DGRs, wastes, and decommissioning are included in the appendices of this presentation. Many other CNSC regulatory documents and CSA standards would apply to the NWMO's proposed operation. The regulatory framework covers the full range of activities related to waste management and decommissioning, including any potential NWMO licensed activities.

The CNSC has been engaging early with the NWMO. It is international best practice to ensure the regulator is involved early in DGR projects for all of the reasons listed on this slide, from building in-house knowledge through independent research to clarifying CNSC's regulatory expectations and requirements to the NWMO.

In today's update, we will highlight how we are meeting our pre-licensing objectives.

CNSC staff's early involvement with the NWMO prior to the submission of a licence application is formalized through a service arrangement between the NWMO and the CNSC which is posted on the CNSC's website. Under the terms of the service arrangement, CNSC staff provide regulatory guidance, carry out technical reviews, and conduct outreach activities to provide information on

CNSC's role as the independent nuclear regulator. The current NWMO/CNSC special project service arrangement is effective for five years until March 31, 2024, unless CNSC receives a licence application.

Pre-licensing technical reviews are conducted by CNSC staff upon request from the NWMO to provide regulatory concerns with meeting regulatory requirements. The most recent technical reviews are listed on this slide. With respect to the first item listed, CNSC staff are working on a request from the NWMO to confirm requirements for a licence to prepare site applications.

Currently staff are conducting an analysis of the regulatory tools available, which includes the existing regulatory framework documents.

With respect to the second item, last month CNSC staff completed a review of the NWMO's environmental baseline monitoring program for northwest Ontario, which was evaluated against current relevant CNSC requirements and guidance.

On the next slide, I will provide a snapshot of staff's review of the NWMO's Mark II used fuel container.

In the fall of 2018, the NWMO requested that CNSC review the design of the Mark II used fuel container, which is depicted. CNSC's vendor design review

process was originally developed for pre-licensing reviews of entire nuclear power plants. In the current case, however, NWMO requested a review of only one component of its engineered barrier system for the DGR, the Mark II design for the used fuel container. And so to address NWMO's request, CNSC staff adapted its well-established VDR process to support a review of the container only. The review was completed in January of 2020, and a summary report is available on our website.

The assessment provided NWMO staff with early feedback on their design intent for the UFC and provided the opportunity for them to learn more about CNSC's oversight. The results of the review will form the basis of a future workshop between NWMO and CNSC technical specialists.

I will now pass the presentation back to Mr. Patrick Burton.

**MR. BURTON:** Thank you, Julia.

In conclusion, CNSC staff are actively working to engage with stakeholders and Indigenous communities to inform them of the role the CNSC plays in regulating nuclear activities in Canada and how they can interact with our processes.

CNSC staff participate in a variety of international DGR initiatives where we keep abreast of best

practices and standards, and where we also share our Canadian best practices internationally.

CNSC staff also have a strategic DGR research program which serves to maintain our in-house expertise and has prepared us to carry out technical assessments of licensing documents.

Finally, the CNSC has a robust regulatory framework for waste management, including for DGRs, and this forms the basis for providing clear regulatory expectations to the NWMO in support of their future applications for CNSC licences.

Ultimately, all of these pre-licensing activities will allow CNSC staff to provide the Commission evidence-based licensing recommendations for NWMO's APM project.

With that, I thank you for your time, and we are happy to receive your questions.

**THE PRESIDENT:** Thank you very much for the presentation. I'll open the floor for questions from Commission Members, and we'll start with Dr. Berube, please.

**MEMBER BERUBE:** Yes, thank you very much for those presentations. They were very well done and informative.

My question goes to the CNSC staff. It's

based on the Indigenous engagement and at some point consultation. I noticed during your presentation you talked that at some point consultation, formal consultation will be engaged. Could you please tell me at what point in this process that would be required?

**MS. MURTHY:** Kavita Murthy, for the record. I would like to ask Mr. Adam Levine from our Indigenous Relations Group to please respond to the question.

**MR. LEVINE:** Good morning. Thank you. My name is Adam Levine. I'm the team lead for Indigenous Relations and Participant Funding at the CNSC.

So we look at the engagement consultation on a continuous spectrum. So we're starting the early engagement relationship building now to ensure that Indigenous communities in the key regions that the NWMO is still researching for a possible facility and project to ensure they understand who we are, our role, and what the regulatory process and consultation process will be to come.

And then once a formal application is submitted to the Impact Assessment Agency and the CNSC to begin the formal regulatory process, which hasn't occurred yet, and that will occur once the NWMO has actually selected a specific site that they want to go forward with



in terms of developing and proposing the DGR, then at that point, once the formal regulatory process begins, that's when us in collaboration with the Impact Assessment Agency, who will be leading the Crown consultation process as per MOU with the IAA.

And that will trigger the whole impact assessment process which includes the early consultation process, development of Indigenous engagement partnership plans, et cetera, which will lay out how Indigenous groups that are involved or concerned about the process will be involved throughout.

So that's when the formal consultation process will begin, when a specific project is proposed and the regulatory process begins.

**THE PRESIDENT:** Dr. McKinnon?

**MEMBER MCKINNON:** Yes, thank you for the presentations. They're very interesting and important topics.

I'm wondering at this early stage are there any fatal flaws that could eliminate a site during the preliminary site investigation phase? Or can they be managed by appropriate design? And if there are any fatal flaw conditions, how is the site investigation being planned to assess that potential? I guess that was a question directed at NWMO.

**MR. WILSON:** Derek Wilson, for the record.

Thank you for the question.

And so just so I'm clear, you're asking if there are any fatal flaws within the site investigation work that would either be, you know, the ability to design around or to take a different course of action? Is that how I understand the question?

**MEMBER MCKINNON:** That's right. Any characteristics of the site that could lead to a fatal flaw condition that would eliminate, you know, the possibility that it could be managed by design or -- well, I'll leave that open to how far, you know, where that boundary between fatal and design is. That's what I'm interested in.

**MR. WILSON:** Okay, well, thank you for that question.

So what we've been doing in terms of our site investigation activities is really going through a systematic approach of more detailed technical assessments to determine the suitability of the geosphere to be able to house the repository.

And going through that, we have six main safety functions in which we're looking to satisfy. And we have a series of much more detailed criteria with respect to the geoscience activities. And as we go through more intensive or more intrusive field investigations, we're

testing the results that we're seeing against those.

And at this point, the two siting communities that we have in place right now, we're not seeing any conditions which would suggest a fatal flaw within the geological regime to require us to make any remedial action from a design perspective.

You know, the -- we've been undertaking work in some of these communities now for, you know, seven to eight years and have a fair good understanding of the potential for it to meet suitability, and this is really going to be a fundamental tenet for us to be able to make our site selection decision in terms of the safety.

We want to be able to ensure that we have a confidence that the safety conditions can be met and that we'd be able to develop a safety case at the selected site at the time that we submit our licence for construction, which will be, as we said in our presentation, in the 2029 timeframe.

So we will -- we will have a level of confidence internally to make our decisions. We would not be making a decision on a fatal flaw. If there was any fatal flaw that was identified and that the safety of the site was at -- was in question whatsoever, that would determine our ability to be able to move forward in that siting community.

But as we've -- as I've said, to date we have not seen anything within these two communities that remain that we see any sort of fatal flaws in the geological conditions.

**MEMBER MCKINNON:** What could some of those flaws be, and how is the drilling program being modified to potentially detect those?

**MR. WILSON:** So it's different in two different geological settings, as you can appreciate.

You know, in southwest where we have quite a bit of knowledge specifically from the Ontario Power Generation low to intermediate level DGR, we understand the base and we have a good understanding of where we would be seeing the intersections of the key formations that are important to our safety case and we'll be -- we'll be testing for those this year in terms of our drilling program and verifying it.

We'll also be conducting 3D seismic surveys of the area to identify if there are features, you know, such as a pinnacle reef or other, you know, geological features that would be -- in such a way that could have an impact on the suitability or the lateral extent of the suitability, the geology in that area.

In our crystalline area, obviously, it's a much more -- crystalline rock, there's more fractures.

What we've done in the initial borehole drilling is really going after areas that we have high levels of confidence that we're going to see what we expect and be able to do that, so we've actually focused our attention on where we expect the good rock to be and now we are starting to move with these last boreholes into more directed drilling into areas or fault areas that we see to understand if our understanding -- you know, to understand if our expectations around the conditions of those fault interactions are as we expect.

And so we're going through that exercise now and then, you know, at the end of this we feel that six boreholes in the northwest will be sufficient for us to have that level of understanding, but obviously if we see conditions in the boreholes that we're drilling this year to suggest that we have to look further, then obviously we'll consider that.

**MEMBER MCKINNON:** Okay. That's very informative. Thank you very much.

**THE PRESIDENT:** Dr. Lacroix.

**MEMBER LACROIX:** Well, thank you very much for the presentation and both submissions. I found it very interesting.

I was wondering, the selection process went from 22 sites -- possible sites down to two sites, and

is it possible that neither of the two remaining sites be not necessarily suitable, but acceptable for reasons that are not technical or scientific but for reasons like political, legal or social reasons? Have you considered this possibility?

**MS. MORTON:** Lise Morton, for the record.

So we remain confident that we are on track to identify a site with a strong safety case and with the communities, with a strong potential for partnership. Of course, we -- you know, we monitor and keep in mind again legal and political interactions, if you will, but certainly from a community perspective we're working hard with the communities currently to really ensure that they have the information they need to make informed decisions and that they're aware and understand the project, but also in terms of starting to do the work required to develop strong and resilient partnerships with those communities.

**MEMBER LACROIX:** Okay. I'm not so much concerned about the community -- the communities themselves as much as in general, you know. There are opponents to this project. No matter how you slice it, there are opponents, and I was wondering, are you expecting or are you bracing yourself for legal challenges?

**MS. MORTON:** Lise Morton, for the record.

I'll begin by giving a bit of an answer on

that, but then I'll certainly turn over to Lisa Frizzell as well, who can elaborate on our communication strategy and how we handle that.

So again, we welcome diverse views on a project like this. We welcome the views of Canadians. We think it's important to get that information and to hear their concerns and aspirations so that we can really respond to those, again, as we start developing this project going forward.

I'll turn it over to Lisa, though, who can elaborate on our communications plan.

**MEMBER LACROIX:** Thank you.

**MS. FRIZZELL:** Thank you, Lise.

Lisa Frizzell, Vice-President of Communications, for the record.

So as Ms. Morton described, we have an active communications program and transparency and collaboration are two of our fundamental values that underpin that program.

As we have narrowed down the number of communities in the siting process and as we approach siting -- the siting decision, we've certainly seen attention ramp up. And in parallel, we've expended our communications efforts.

We actively address misinformation. We

also provide many opportunities for people to engage in a way that's meaningful for them, so in some cases that might mean a specific briefing for an interested group, it might mean participating in community engagement efforts or sharing information with specific stakeholders. There's a wide range of opportunities.

And as I mentioned earlier, we also continuously and actively seek input on our work to make sure that we're understanding from people the concerns and questions they might have that will need to be addressed before a siting decision can be made. And then we take all of that insight in addition to answering their questions and addressing their concerns and use it to help further shape our communications program going forward to make sure we're addressing the issues on people's minds.

**MEMBER LACROIX:** Okay. Okay, that's great.

And one last question. What are the remaining hurdles before you make the final decision? Are they technical right now or are they, I don't know, somewhere else -- something else?

**MS. MORTON:** Lise Morton, for the record.

I don't know that I would characterize them as hurdles. They're just simply the steps that we need to go through in the process.



**MEMBER LACROIX:** Okay.

**MS. MORTON:** So again, with respect to working with communities, we need to work with communities so that they can define what their demonstration of willingness will look like, and that's work that's being undertaken this year in both Ignace and South Bruce, how will they make their decision. So that's just, again, a step that needs to be -- to be worked through.

And then again, there are some -- there's some work that we need to complete in terms of some very baseline studies to provide communities with the amount of information they need prior to making the decision and then we need to also work on draft hosting agreements with these communities.

So again, I wouldn't see them as hurdles.

**MEMBER LACROIX:** Okay.

**MS. MORTON:** These are just steps in the process that we need to complete.

**MEMBER LACROIX:** That's good. Thank you very much.

**THE PRESIDENT:** Maybe to elaborate on the question from Dr. Lacroix, do you undertake on a regular basis polling or surveys to see what level of community support is, how it's trending? And I don't just mean the host community, but I meant the border stakeholder

community.

**MS. FRIZZELL:** So Lisa Frizzell, for the record. I'm the Vice-President of Communications.

So we undertake a range of public attitude research that is getting more intensive progressively as we approach siting. So there have been a range of polls, surveys, focus groups and the like on various aspects of our project not in siting communities, but beyond as well, on various topics including our five-year implementation plan, transportation and general interest in things related to the project.

**THE PRESIDENT:** Thank you.

I think the next time you come to give us an update, it would be -- we would find it very helpful if you shared some of what you're hearing from those surveys and the kinds of concerns or input that you're getting.

Thank you.

Ms. Maharaj.

**MEMBER MAHARAJ:** Thank you, Madam Velshi.

I have a couple of questions for the NWMO with respect to the design basis. And perhaps, if it's possible, could we take a look at the picture at slide 12 of the NWMO presentation? It might just help to give a basis for my question.

It's the picture of the facility and it

shows where the development underground is.

**THE PRESIDENT:** Can you see it,  
Ms. Maharaj?

**MEMBER MAHARAJ:** I have it on my secondary  
screen, but --

**THE PRESIDENT:** It's on the main screen.

**MEMBER MAHARAJ:** Go ahead? Okay.

With respect to the design basis, I noted in your written report that you've accounted for the current spent fuel of three million bundles and an estimated burden of 5.5 million bundles by the end of the active lifespan for the current operating facilities. And I can see when I look at the design of the underground section of the -- of the repository that there looks like there are three wings where the spent fuel would be stored.

My question is whether or not this particular design is expandable or has considered becoming expandable to account for spent fuel that might exceed 5.5 million bundles, for example, if new facilities are put into place between now and the end of the life cycle of the existing nuclear facilities.

**MR. WILSON:** Derek Wilson, for the record. Thank you for that question.

Yes, we -- this -- the depiction that you see here on slide 12 is really just a snapshot of -- for

the purposes of our conceptual design and our lifecycle cost estimating, and this is actually a sedimentary layout. We have a differing layout for -- for a crystalline scenario because, again, the rock formations are different and you'd have to align with the existing fracture networks in a crystalline environment where we have a bit more flexibility here.

Historically, because of -- we didn't have citing communities identified, as we went through our conceptual designs and our lifecycle costing, we looked at a base case scenario and an alternative scenario, which was 3.6 million bundles and 7.2 million bundles, to address the issue of expansion -- potential expansion because the *Nuclear Fuel Waste Act*, you know, is pretty clear and APM, as we developed it, we wanted to look for the potential to expand the facilities. So our design has to be expandable.

And now that we're actually looking at specific areas, we -- while we're, you know, designing again for the context of our lifecycle costing and being able to understand, you know, the positioning of the repository for the existing 5.5 million bundles, we also look at the expandability of it and what potential would we be able to have for, say, a CANDU equivalent or, just as you probably are quite aware, the SMR industry is pursuing in Canada and so, you know, we're looking at what a

potential expansion could look like as well for SMR wastes, for example.

So expandability is definitely one of our criteria and it is being assessed in both of the siting areas as we get more defined information from that.

**MEMBER MAHARAJ:** Thank you very much, Mr. Wilson. You actually answered my second question ahead of me asking with respect to fuel types and the potential for different types of fuel -- spent fuel for SMRs.

Those are my -- that's my question. I really was very curious about the design basis and the potential for expandability both in size and fuel type.

**THE PRESIDENT:** Great. Thank you.

Dr. Demeter.

**MEMBER DEMETER:** Thank you very much for the informative presentations.

This is more a process question about engagement with the community. Obviously, decision points have to be made to be able to move forward or else you'd never move forward.

So you find a willing host community in 2021 with operations in 2043, it's going to be a very different host community by 2043, so the sort of consent or willingness of today's community is going to be different than the future community. And what process do you have in

place to continually engage with the community as you go along to ensure the same level of willingness to participate exists until operations, which is the 20 years hence, if not more so?

**MS. MORTON:** Lise Morton, for the record.

So in terms of -- I just want to make sure I'm clear. In terms of the decision you mentioned in 2021, actually, you know, the communities will likely be making their own individual decisions closer to 2023, some time in that timeframe.

But one of the things we speak about as well is really looking for a compelling demonstration of willingness. And what does "compelling" mean?

So really, it means resilient and able to be sustainable through the many years, as you indicate, that are going to follow the site selection process in terms of the regulatory approvals process, the design, construction and operation of the facility.

As you say, these are facilities that have long timespans, so in order to ensure that you -- first of all, you have to start with, as I say, a resilient demonstration of that willingness, but then the engagement doesn't end. The engagement continues very much as it is now with the siting community as we move forward through all of those processes.

So I'll ask if Lisa Frizzell has anything else to add in terms of that, but certainly in terms of, again, engagement, it doesn't end at site selection and we remain committed to working with those communities. And our draft hosting agreements that we would reach with those communities would also lay out further steps in future decision-making and the future role of the community throughout the life cycle of the project.

I'll just ask Lisa if she has anything else to add.

**MS. FRIZZELL:** Thank you.

Lisa Frizzell, for the record.

I think Ms. Morton has described it well. Like the key is sustained engagement throughout the process and administration of the hosting agreements and implementation of the project.

I would add that we also have a very active program to engage with young people in and around siting communities. We've received strong feedback from communities that this is a really important part of our work for precisely the reason that you described. Some of the decisions being made today will be -- will affect or be implemented by young people who are there now over the years because this is a decades-long program.

So that's something we really take to

heart and have an active program to involve and engage them.

**THE PRESIDENT:** I have a question for NWMO, a quick question first, and then I'll move to the Impact Assessment Agency.

On slide 17 on licensing, I was surprised to see that -- or not see that the first CNSC licence that you will be seeking will be the site preparation licence, and that doesn't show up on the slide. Is there a reason why it doesn't?

**MS. MORTON:** Lise Morton, for the record.

No, Madam Velshi. Thank you for that.

Certainly the intent is to submit a preparation for -- or a site -- licence to prepare the site first. Absolutely that would be the first part of the step.

I believe we may have spoken to it in terms of the next steps, so again, once we would have a site selection -- or a site selected in 2023, then that application for site preparation would follow shortly thereafter around 2024. But certainly that is intended to be a first step in the licensing process.

**THE PRESIDENT:** I think it would be helpful if -- because I suspect you showed this slide to many audiences that you'd kind of amend that, that the site



prep licence -- the review of that application is part of the impact assessment review as well, right, the one project, one review, which is kind of a nice segue to the question to the Impact Assessment Agency, and I believe we've got representatives here from there.

This will likely be the first nuclear project undergoing an impact assessment. From what you know of the NWMO's and the CNSC's activities in readiness for this, any comments, any concerns that you have?

And I'm particularly interested around the transportation element of this project, and does that get factored into the impact assessment, or how does it?

**MR. CARRIERE:** Good afternoon. Sean Carrier. I am the Acting Director for the Ontario regional office of the Impact Assessment Agency.

Yes. So at this stage, we are still -- so we are working with the NWMO on -- through the site selection process. We are in the pre-planning phase, so the proponent has not submitted their initial project description as required. So we are participating in these pre-planning activities recognizing their importance and their value in setting up an effective impact assessment process once it's formally engaged.

So as we are looking at the transportation elements, those will be -- we currently do not have any

information on the transportation, but we will be looking to the proponent to include that kind of information in the initial project description as they scope out what the proposed activity is as part of the initiation of the impact assessment.

**THE PRESIDENT:** Okay. Thank you very much.

Let's see if there's a second round of questions.

Dr. Berube?

**MEMBER BERUBE:** Yes. My question's got to do with actual site selection and design and integration of those two factors.

I'm going to start with NWMO and then I want to hear a little bit from the impact assessment people on their perspective on this.

Looking from the NWMO perspective, I would think at this point they're moving towards a more solidified design for the facility since that's going to obviously be a critical part of the impact assessment. And that, of course, is going to be based on the type of rock you have and the things that you've mentioned at this point.

Could you just elaborate where you are in that design process? How flexible is that and how are you

feeding information from other bodies that would actually inform your design process at this time, and where do you think that's going to lead?

**MR. WILSON:** Derek Wilson, for the record.

It's a good question, and it's something that we've -- we're turning our attention to now that we have the two siting areas identified and the locations of potential repositories identified as well.

You know, we've had the opportunity to advance our conceptual design over the last, you know, two decades in terms of what a deep geological repository can look like and we've evolved that design based on, you know, looking at innovations such as in the latest update in 2016 moving to our engineered barrier system as we have it now as compared to more the international approach to large container placement.

So you know, we've been doing this evolution of the conceptual design. Now that we're getting site-specific information, we're able to now look at each of those areas specifically as it relates to the layout of the underground facilities, the depth and so on.

You know, from an operating experience perspective, we have very close connections with Finland and Loviisa. You know, they are -- they're implementing now their construction for the repository. They're looking

to be in operation by 2025. And with that, you know, we're getting very good operating experience for their learnings.

There are also other countries internationally that are making progress in the implementation, Sweden being another.

So we're now moving to, still at a conceptual level, at the design but from a site-specific perspective, and moving that design into preliminary engineering.

And so that by the time that we make our site selection decision, moving those -- you know, we're trying to be careful not to advance designs at two facilities to a great extent to move forward with one, so we're looking at the areas that are most important to the design and supporting our site selection decision from a safety perspective, and then we'll move into, in parallel with the detailed site characterization, more preliminary designs to support our licence -- application for construction licence later, you know, closer to the end of the 2020s.

So the design is progressing, you know, commensurate with the decisions that we have in front of us, and we're incorporating the lessons learned from our international partners and our expert reviews that we do, you know, such as the geoscience review group and others.

We have a series of experts that are supporting us in their review of our activities and, of course, we're incorporating innovation as we go forward.

**THE PRESIDENT:** Dr. McKinnon...?

**MEMBER MCKINNON:** Yes, thank you.

I also have a question related to the design and the question is for NWMO. It is in connection with ongoing research. So I am curious to know, is the ongoing research related to the DGR, is it part of solving remaining critical unknowns for the design or improvements or detailed aspects of the performance of each of the potential sites and is that research selected on the basis of any process such as risk assessment for repository performance?

**MR. WILSON:** Derek Wilson, for the record.

So our research program at the beginning of the organization's existence was really to build a level of knowledge around the various material sciences and the aspects of a deep geologic repository in a variety of settings, both in crystal and in sedimentary, and that has really helped us establish our methodology for our safety case and supporting our design decisions as well.

We are starting to see now our R&D activities are now transitioning into our practice. So in some cases we are developing new methods in terms of

testing such as core water extraction from both crystal and sedimentary core samples. Other practical methodologies and modelling that we have been refining over a number of years with industry partners and academic partners, again, for the application now that we are actually getting into, site-specific information and transitioning that from research into practice.

We do have an R&D steering committee which represents a cross-section of our organization in different lines of business, including our safety assessment, our engineering, regulatory and indigenous teams, and so we look at research going forward in terms of the -- I wouldn't suggest that there are a lot of areas of gaps that we need to fill, it is really just improving our understanding and improving our confidence in the safety statements and material expectations that we have.

Natural analogues is one that we have. You heard quite a bit from the CNSC staff in terms of the natural analogues. We are looking at natural analogues from the use of bentonite, copper, as well as, from a safety case perspective, the Cigar Lake scenario as well. So these are all complementing our work. I wouldn't suggest that we are pinpointing them based on fatal flaws or anything that is coming forward.

And again, we are collaborating very well

with our international colleagues and utilizing their underground research facilities to be able to join on things that are of interest to us collectively from a deep geologic perspective.

We have also updated, in part of the design review that we did with the CNSC, the vendor design review, you know, really identified a need for us to improve our linkages between R&D and design through our management system and we undertook that as part of that design review, which was very helpful for us. So again, we are showing linkages of how R&D is actually contributing into design.

**MEMBER MCKINNON:** Okay. That is very helpful. Thank you very much.

**THE PRESIDENT:** Following up on the R&D question. From what you have described, most of the focus is very much on the scientific, you know, the geotechnical aspects of it. Is there any social science R&D being done, whether it is national or international, with your collaborative efforts on -- you know, how does one communicate the existence of hazards centuries from now in languages that don't exist? Is there work along those lines being done? NWMO?

**MR. WILSON:** Derek Wilson, for the record. We are undertaking, you know,

participation in many of the NEA and IAEA initiatives specifically related to the institutional controls, the preservation of records and information as we go forward. So we have been participating in those forums now for probably the last seven years and we continue to participate in that forum.

That really is -- you know, speaking to a project to this multigenerational, in a 175-year timeframe, is important to us and is a question that obviously arises from a closure perspective in institutional control requirements.

From a social science perspective maybe, I don't know if Dr. Mahrez Ben Belfadhel would like to comment or Lise Morton...?

**MS. MORTON:** Lise Morton, for the record. Yes, go ahead, Ben.

**DR. BELFADHEL:** Yes, certainly. Also on the social side we are also involved internationally. For example, the NWMO has representation on the NEA Forum for Stakeholder Confidence, the FSA, and we are actively involved. Actually for a certain period we have been co-chairing that committee, working with other countries designing approaches, engagement approaches on how to build confidence on deep geological repositories.

**THE PRESIDENT:** Thank you.



Given that we have some other folks who have come here today, I would like to give them an opportunity to see if they have any issues they want to raise, any advice they would want to give to the Commission based on what they know about the APM and what they have heard today, and maybe I will start with the representative from the Independent Advisory Group, Mr. Van Geel.

Any advice around the research program or anything else?

**MR. VAN GEEL:** Hi. Paul Van Geel, I am the current Chair of the Independent Advisory Group. I am a Professor at Carleton University in the Department of Civil and Environmental Engineering.

The mandate of our group is to oversee or to review the research activities at both the NWMO and at the CNSC in terms of their supporting research for the DGR and I would just like to echo the two presentations.

The NWMO is clearly engaged with numerous high-quality researchers across Canada in terms of forwarding and improving their understanding of both crystal and sedimentary rock and aspects of the engineered barrier. Both the NWMO and the CNSC are engaged with a lot of international projects to again strengthen their abilities to support that safety case and I mean we are just -- you know, as we get closer and closer to

identifying a site, I know the NWMO is keen to identify a site and to apply a lot of their techniques that they have developed, et cetera, to an actual site. So it is a huge undertaking and the research is at the leading edge.

I mean we always are trying to push our understanding more and more as we go forward, but at this point there is nothing that I would like to highlight other than that I concur with the two presentations that have been given today.

**THE PRESIDENT:** Thank you. Thanks very much for that reassurance.

And maybe I will ask Mr. Delaney from NRCan if he would like to add anything in particular to do with the Waste Policy Modernization Review and public engagement that is underway. Any early findings from that that may have an impact on the APM?

**MR. DELANEY:** Jim Delaney, Director of the Uranium and Radioactive Waste Division at Natural Resources Canada, for the record.

Yes. In terms of our role with respect to the *Nuclear Fuel Waste Act*, it establishes the oversight that the Government of Canada provides in terms of the Minister of Natural Resources for the long-term management of nuclear fuel waste in Canada. So we continue to provide oversight, reviewing NWMO annual reports and the progress

that they are making, and every year that an annual report is submitted our Minister does provide a statement on the progress that the NWMO is making.

And they have made significant progress over the years, as you have heard here today, particularly in terms of advancing the Adaptive Phased Management project, but also in terms of the approach that they are taking in terms of engaging or consulting with local communities as well as indigenous peoples.

In terms of the policy review that we have underway, it continues to be underway and I think the last time that we had updated the Commission on the policy review we hadn't launched. So we did launch the policy review on November 16th of 2020. The policy review continues to be underway until May 31st in terms of engagement that we are undertaking. It won't end there. We will be preparing a what we heard report and a draft policy that will go out for further public comment later on. Either late summer or early fall is the target for that.

So we are continuing to engage broadly. We have a web portal that has been launched to support the initiative with online forums, forums that can be provided. We are also engaging with indigenous communities, interested Canadians, environmental groups.

So that process remains underway and I think in terms of where the policy may land at this time I think it is too early to presume what that might look like, but in terms of project reviews that are underway, those project reviews and the processes that are underway are recognized as continuing through. You know, we do have a plan for nuclear fuel waste and the NWMO is advancing that plan, so the NWMO project itself would not be impacted necessarily by the policy review and the strategy that is underway at this time.

**THE PRESIDENT:** Great. Thank you very much.

Thank you to NWMO, CNSC staff and the other representatives for the very informative presentations and discussions on the APM. You have clearly demonstrated to us how robust, thorough, inclusive and collaborative the process is, so we very much appreciate that.

We will take a break for lunch and we will reconvene at 1:35 p.m. Thank you all.

--- Upon recessing at 12:35 p.m. /

Suspension à 12 h 35

--- Upon resuming at 1:35 p.m. /

Reprise à 13 h 35

**THE PRESIDENT:** Good afternoon and welcome back.

The next item on the agenda is the presentation from CNSC staff on the Pilot Approach for Periodic Environmental Protection Review Reports, as outlined in CMD 21-M18.

I will turn it to CNSC staff for the presentation.

Ms. Tadros, over to you, please.

**CMD 21-M18**

**Oral presentation by CNSC staff**

**MS. TADROS:** Thank you, President Velshi, and good afternoon, Members of the Commission.

For the record, my name is Haidy Tadros, I am the Director General of the Directorate of Environmental and Radiation Protection and Assessment at the CNSC.

Joining me today for the presentation are Dr. Nana Kwamena, Director of the Environmental Assessment Division, and Mr. Doug Wylie, Environmental Assessment Officer and Lead Technical Expert on this initiative.

Online we also have other CNSC colleagues involved in this initiative who are available should you have any questions.

We are pleased to be with you here today to present a new approach that we are implementing with respect to publishing Environmental Protection Reviews under the *Nuclear Safety and Control Act*. This new approach aligns with CNSC's priorities of being a modern, trusted and agile regulator by providing more transparency of the technical assessments that CNSC staff conduct of a licensee's environmental protection measures.

This presentation is divided into two parts.

In the first part we will provide some context to the different environmental reviews in Canadian legislation. We will also outline the Environmental Protection Reviews conducted by CNSC staff, which is the focus of this meeting item, as well as describe the new approach in some detail and the changes this initiative may have for the Commission Members.

The second part of the presentation will cover what went into the development of this new approach by describing the pilot project for the Blind River Refinery environmental review report, a CNSC-licensed facility with an upcoming relicensing hearing. We will

also provide an overview of the initial outreach and consultation activities that have been completed to support the implementation of this new approach. Lastly, we will go over how this pilot project and the feedback received will inform future reports.

I would now like to turn the presentation to Dr. Nana Kwamena to walk you through the proposed approach.

**DR. KWAMENA:** Good afternoon. My name is Dr. Nana Kwamena and I am the Director of the Environmental Assessment Division at the CNSC.

The Environmental Assessment Division is the lead division responsible for coordinating and leading environmental reviews at the CNSC.

The CNSC assesses the environmental effects of all nuclear facilities or activities at every phase of the lifecycle. Early in the process CNSC staff determine which type of environmental review applies by reviewing the information submitted by the licensee or applicant. This slide lists the different types of environmental reviews based on the current regulatory framework. I will briefly describe the different types of environmental reviews before highlighting the one that will be the focus of today's presentation.

The *Impact Assessment Act* introduced in

August 2019 applies to designated projects as defined by the *Physical Activities Regulations*. The Impact Assessment Agency of Canada is the lead agency for impact assessments of nuclear designated projects. There are also ongoing projects with environmental assessments initiated under the *Canadian Environmental Assessment Act, 2012*. These environmental assessments are led by the CNSC and continue under the current processes due to transitional provisions under the *Impact Assessment Act*.

If no impact assessment is required, the next potential review would be if the project falls under the Federal Lands Review provisions of the *Impact Assessment Act*. This would be a process led by the CNSC.

In some scenarios there may be applicable processes for provincial, territorial or land claim agreement reviews, which depends on the type of project and its geographic location.

The CNSC also conducts Environmental Protection Reviews as part of its licensing framework for all licence applications with potential environmental interactions in accordance with its mandate under the *Nuclear Safety and Control Act*. Today's presentation will focus on this particular type of environmental review and how staff's assessment is presented to the Commission, Indigenous groups and members of the public.



An Environmental Protection Review under the *Nuclear Safety and Control Act*, also known as an EPR under the NSCA, is primarily based on information that an applicant or licensee is required to submit to the CNSC through the established licensing process. This information includes the licence application and its supporting documentation and information on environmental protection measures.

As illustrated by the figure on this slide, an EPR under the NSCA is also based on compliance and technical assessment activities completed by CNSC staff. For example, this could include reviews of annual environmental monitoring or compliance reports, as shown by the blue square in the upper right corner of the slide, and environmental risk assessments, as indicated by the grey box in the middle of the slide.

An EPR under the NSCA may also be supported by independent verification activities such as the CNSC's Independent Environmental Monitoring Program, or IEMP, as well as relevant regional health studies, other environmental monitoring programs and Indigenous knowledge studies, as shown by the upper left corner of the slide.

This feedback mechanism and CNSC staff's assessment through its compliance verification activities inform and improve a licensee's environmental protection

measures.

The Environmental Protection Review serves to assess whether the applicant or licensee will, in carrying out a licensed activity, make adequate provision for the protection of the environment and the health and safety of persons. An EPR under the NSCA is conducted for projects that are not subject to impact assessments or for projects previously assessed through an environmental assessment under federal environmental assessment legislation.

An EPR report is an approximately 70-page document written by CNSC staff that focuses on items that are of Indigenous, public and regulatory interest. The report documents CNSC staff's scientific, evidence-based findings from CNSC staff's technical assessment of a licensee's environmental protection measures and it is meant to be a stand-alone document.

EPR reports are informed by CNSC staff's ongoing compliance verification work of a licensee's environmental protection measures, including monitoring. EPR reports are meant to summarize this ongoing work as a snapshot in time.

This slide provides an example of a table of contents from an EPR report. Subsections can differ from one report to the next, depending on applicability,

but the main sections remain largely the same.

As previously mentioned, the majority of the report speaks to compliance verification of a licensee's environmental protection measures but also includes other independent inputs such as the CNSC's Independent Environmental Monitoring Program, relevant health studies and other environmental monitoring programs.

CNSC staff have heard repeatedly from members of the public and Indigenous groups that there is insufficient time prior to Commission proceedings to review CNSC staff's submissions. To address this concern, CNSC staff are piloting a new approach to posting Environmental Protection Review reports online separately and in advance of Commission Member Documents. It is anticipated that this approach would provide additional time to review the environmental and health information found in EPR reports.

In support of the CNSC's mandate not only to ensure protection of the environment and human health, this new approach also serves to disseminate the objective and scientific information. Furthermore, the purpose of CNSC's approach is:

- to increase transparency of CNSC staff's Environmental Protection Reviews and to build trust with the public and Indigenous groups by providing periodic updates on CNSC staff's assessment of environmental

protection measures and make this easily accessible online throughout a licensing term;

- to provide more time to interested parties with the environmental and health information found in these reports; and

- to better highlight CNSC staff's technical assessments as presented in the EPR reports outside of a CMD and licensing action.

This table presents a comparison of the current process for EPR reports and the new approach. EPR reports are currently prepared for specific licensing hearings where a Commission decision is being requested. However, CNSC staff's compliance and technical work is done on an ongoing basis every day throughout a licence term. This new approach decouples the EPR report from licensing. Further, this approach better reflects staff's ongoing work by keeping the EPR reports updated based on a licensee's Environmental Risk Assessment, which previously could be updated during the licensing cycle with no Commission proceeding to highlight staff's assessment.

As for the main inputs for the EPR report, these will largely remain the same and include staff's assessment of the licensee's environmental protection measures and other relevant environmental and health information. However, as the EPR report will not be linked

to a licensing decision, the licence application will no longer be one of the main inputs for drafting the reports.

Currently, EPR reports are appended to CNSC staff's Commission Member Documents, or CMDs, and support CNSC staff's recommendations and conclusions. With the new approach, the EPR report will not speak to a specific licensing decision for existing facilities and instead be more compliance-focused.

According to CSA Standard N288.6 Environmental Risk Assessments for Class 1 Facilities and Uranium Mines and Mills, ERAs are to be updated at a minimum of every five years or if there is a significant change in the facility or transition to a new phase of the facility's lifecycle. As per CNSC REGDOC-2.9.1

*Environmental Principles Assessment and Protection Measures, Class 1 facilities and Uranium Mines and Mills* are required to conduct an ERA. The ERA must be posted on the licensee's website according to CNSC REGDOC-3.2.1 *Public Information and Disclosure*.

As previously illustrated, environmental risk assessments are one of the main inputs of CNSC staff's technical assessments for environmental protection and are the basis for writing the environmental protection review reports. Therefore, the EPR reports would be updated periodically based on staff assessments of the revisions to

the facility's ERA at a minimum of every five years.

The periodic posting of a facility's EPR report would increase access to CNSC staff's assessment of the ERA and other environmental protection measures. For example, if a facility is granted a 10-year licence, the EPR report would be updated at least twice during the licence period based on the five-year review of its ERA. This would provide more transparency to staff's regulatory oversight in this area by allowing access to the reports in between Commission proceedings for licensing actions.

This slide summarizes how this approach will affect the Commission and its decisions. The majority of the content of the EPR reports will remain the same, though as mentioned earlier, they will no longer speak to specific licensing decisions. We acknowledge there may be some revisions based on the feedback that we receive through this pilot project.

The EPR reports will continue to be available for the Commission's licensing decision through direct reference in the environmental protection safety and control area of CNSC staff's CMD.

If there are updates to a licensee's environmental protection program that is not covered in the EPR report, the CMD will cover any updated environmental protection information that is not found in the report.

For applications for new facilities that do not trigger the *Impact Assessment Act*, the EPR reports will continue to be appended to the CMD as is current practice.

I will now pass the presentation to Mr. Doug Wylie, who will outline how this approach is being implemented as part of the pilot project.

**MR. WYLIE:** Thank you, Dr. Kwamena. And good afternoon, President Velshi and Members of the Commission.

My name is Doug Wylie and I am an environmental assessment officer within the CNSC's Environmental Assessment Division. And I'll be speaking in more detail to the pilot project and our new approach for releasing EPR reports.

CNSC staff considered two factors in choosing which facility would be the subject of the pilot project, such as having an existing and accepted environmental risk assessment, which Dr. Kwamena has mentioned forms the basis of the EPR report, and a relicensing hearing in the near future so that the new process could be tested in short order and with sufficient time to allow for drafting and publishing the report to provide Indigenous groups and members of the public with increased time with the information prior to a hearing.

Based on these factors and the upcoming calendar of Commission proceedings, the Blind River Refinery was selected as the first report under this new process.

The pilot EPR report for the Blind River Refinery was published in English and in French online on April 21st, 2021, to the CNSC website and the Open Government portal. The Open Government portal was chosen because it is searchable and easy to use and is a suitable platform for hosting documents and data. It is anticipated that future reports will be also posted in this way.

This new approach connects with a broader government initiative to make governmental information and data more available to those interested in it in an easy-to-find and centralized way.

CNSC staff chose to use the Let's Talk Nuclear Safety platform to gather feedback on the new approach for posting these reports online ahead of a licensing decision. CNSC has successfully used this approach for consultation on regulatory documents and want to test consultation on other CNSC documents. The consultation period for the approach closes on July 16, 2021, before the posting of CNSC staff's CMD.

On this slide, we see an outline of the timeline for posting the Blind River EPR report, which was drafted over the summer of 2020 based on the existing



environmental risk assessment for the facility at the time. It was later updated over the fall and winter months based on an environmental risk assessment update that was submitted by Cameco at the end of September 2020. Under this new approach, the environmental and human health information is being provided approximately four months ahead of when it would have been published under the old process.

Ideally, future reports would be decoupled from the licensing process and published even earlier. However, staff acknowledge a transition period may be required as staff implement this approach. Time will be needed for CNSC staff to produce the catalogue of EPR reports, with the report being published somewhere between the beginning and middle of the licensing review process.

Aside from the Let's Talk Nuclear Safety platform, which is only planned to seek feedback for the pilot project, CNSC staff have also used a number of communication methods to inform Indigenous groups and members of the public of this new approach. These methods include updates to a number of different pages of the CNSC website, such as the homepage Latest News and the Blind River Refinery facility page.

CNSC staff also identified Indigenous groups nearby the facility and notification emails were

sent directly, similar to what is done currently for CNSC-led environmental assessments. Social media platforms were also used to promote the new approach and release of the Blind River Refinery report, and an email to the info-subscriber list was sent to reach a broader audience of those previously interested in CNSC activities.

Guidance is provided on the Let's Talk Nuclear Safety site to explain the purpose of the approach and the type of feedback CNSC staff are seeking. For this consultation period, we are seeking comments on the process rather than the content of the report and sample questions have been provided for consideration to help guide respondents.

CNSC staff have also listed the EA inbox, an email address directly managed by staff in the Environmental Assessment Division at the CNSC, as an additional method of communication for this approach.

In general, all comments received on the new approach will be considered for future improvements to the process. Comments received on the content of the report as part of this pilot will be considered for future updates to the EPR report, and CNSC staff will include details of the comments received directly in the Blind River Refinery licence renewal supplemental Commission Member Document.

Some feedback on this approach may note that the information in these reports may become outdated based on when they were written. In the scenario where there is a licensing decision to be made and the EPR report was not updated, the environmental protection section of a Commission Member Document will speak to any new information. It is CNSC staff's opinion that the benefits of the approach of being more transparent and providing more opportunity to review staff's assessment outweigh the negative aspects.

Furthermore, formal opportunities to comment on the reports' content will continue to exist via the annual regulatory oversight reports and Commission hearings. Regulatory oversight reports will allow for the year-to-year discussions regarding the compliance activities that may not be updated in the EPR reports each year but are being done on an ongoing basis by CNSC staff.

CNSC staff developed this rubric which outlines three categories of anticipated comments, the first being IT or procedural questions, which can be handled directly by the Environmental Assessment Division. The second is errata or corrections, which again will be dealt with by the same division and noted for future report updates. Lastly, comments related to technical matters, safety significance, and difference of scientific opinion

will be managed directly through the Environmental Assessment Division working with the appropriate subject matter experts, licensing officers, and also Secretariat, as necessary.

As outlined on the previous slide, comments and how they were addressed would be summarized in a CMD for the next licensing hearing or regulatory oversight report, whichever is sooner, for the Commission's information.

CNSC staff have been monitoring the Let's Talk Nuclear Safety platform for feedback and will continue to do so until the window closes in July. Feedback will be tracked for future EPR reports for continuous improvement of this new process.

The main criteria for assessing whether the project achieved its objective will be the comments received on the report. CNSC staff will be monitoring access to the report as well as the number and quality of comments we receive. We note that one pilot project may not be enough to assess how this approach is received and that an acclimation period may be required.

In addition, following the Blind River Refinery licence renewal hearing, CNSC staff will request feedback from the Commission through Secretariat on whether the Commission felt it was beneficial or heard directly

from intervenors regarding this approach.

Thank you. And I will now pass the presentation back to Ms. Haidy Tadros to conclude.

**MS. TADROS:** Thank you.

In summary, the proposed approach would add more transparency to CNSC staff's assessment of a licensee's environmental protection measures and aims to build trust with the public and Indigenous groups.

Aside from being available online between licensing decisions, EPR reports will continue to be a part of the Commission's licensing decision-making basis by being directly referenced in CNSC staff's Commission Member Documents. If there is new information related to the protection of the environment, and the EPR report has not been updated before a Commission proceeding, then the EP -- environmental protection safety and control area in the CMD would reflect these updates as necessary.

Lastly, as part of CNSC's commitment to continuous improvement, feedback from this pilot project will be incorporated into future reports where possible.

This concludes our presentation, and we welcome any questions or comments you may have.

**THE PRESIDENT:** Thank you very much for the presentation.

And let's start with Dr. McKinnon.

**MEMBER MCKINNON:** Yeah, thank you for that presentation. I think this is a really excellent initiative. We often hear of the frustration of the intervenors with timely access to information.

I have a related question, and it's perhaps -- well, it's connected to the information inside the reports. There's often questions about the availability and access to data from environmental monitoring. These EPR reports will be updated every five years or so and perhaps referred to in the RORs. But is it possible to release the data from environmental monitoring on a more short-term basis for access to the public?

**MS. TADROS:** Haidy Tadros, for the record. And thank you for that question.

Perhaps I'll start and perhaps Dr. Kwamena can supplement my answer.

Absolutely, I think it is important. And in parallel, CNSC staff have been working as part of a task group that we have with Environment and Climate Change Canada where we're looking at uploading a lot of the data sets that we receive from our Class I facilities onto the Open Government platform. And that is not necessarily linked to the EPR report. It is data when it is available from our licensees.

In addition, our Independent Environmental

Monitoring Program, as the Commission is aware, these reports are provided and uploaded to the CNSC website regularly once a campaign has been completed and the sample results have been analyzed and measured.

So there are several points within our regulatory activities that allow for data sets that do form the basis of much of CNSC staff's review and evaluation in the EPR reports but other areas as well to be uploaded and available.

There's always a drive to ensure more data is made available. So we are working on that as well with regards to the licensees' data sets through their compliance reports.

I'm not sure if Dr. Kwamena would like to add anything further.

**DR. KWAMENA:** Dr. Nana Kwamena, for the record.

Ms. Tadros adequately summarized how the information is currently available.

I'll just reiterate that the licensee is required to post their Environmental Risk Assessment, as we said in our presentation. And there is also a requirement to post their annual compliance report, so that is another mechanism to have some of that data that's available. And of course, if there is a request for additional data that

is not provided, we would work with the licensee, as Ms. Tadros indicated, to see if some of that data could be released to the person or the group that is requesting it.

**MEMBER MCKINNON:** Okay, that's great to hear that. Thank you very much.

**THE PRESIDENT:** Ms. Tadros, I had the benefit last week of getting a demonstration of the Open Government portal, and it is highly impressive not only on how easy it is to use but the richness of the data that's in there. And once we get some of the CNSC and licensee information on that portal, I think a demonstration for Commission Members would be extremely helpful for us to appreciate, as I said, both the usability and accessibility that this will provide and address the long-standing concerns that we hear from intervenors about that.

So if you can take that as an action, that would be great, please.

**MS. TADROS:** Haidy Tadros, for the record. Absolutely. Thank you.

**THE PRESIDENT:** Dr. Lacroix?

**MEMBER LACROIX:** Yes, thank you very much for this presentation.

I must say that when I read your submissions and I went through the slides, I didn't take your word for it, so I went to check the site itself. And



I must say that I was impressed by the EPR report on the Blind River Refinery. I found it very helpful in the sense that the summary that is provided with four bullets about the facility, about the report, about the environmental monitoring, and about the human health was very useful. It provides a clear and concise picture of the whole report and for once I was not buried in too many data. So thank you very much for this improvement.

I only have two clerical questions. The first one, is it possible to download the report in a PDF file? And the second question, is it possible to have the date of the latest update of the report itself? An easy check for this. You need not answer these questions right away. If there is a PDF file, I'll find out, but if it's yes, okay. If it's no, well, that's fine with me anyway.

**MS. TADROS:** Haidy Tadros, for the record.

And thank you for those comments. It's very important to have an independent verification of work and activities that we conduct to ensure that it is verifiable of some of the claims that we are making. So thank you for that comment.

Currently on our website, as you've noted, the report is not available on PDF. So I think that might be something that we would strive to ensure again from accessibility perspective that information is provided in

formats that can be easily retrieved. So that is definitely something that we are going to be looking at.

And with regards to the dates, just with regards to your question for my clarity, you were asking about dates when future EPR reports would be available?

**MEMBER LACROIX:** Exactly. Precisely. You know, not to confuse the old report with the new report with the update.

**MS. TADROS:** Thank you for that clarification. Haidy Tadros, for the record.

So what we've currently done, and maybe Dr. Kwamena can speak to it, is we do have a plan for future EPR reports on which ones are coming out. So I would ask Dr. Kwamena perhaps to take that question.

**DR. KWAMENA:** Dr. Nana Kwamena, for the record.

I think I understood your question slightly differently. So there is at the beginning of the report an indication of the report version. So that would indicate when this was last updated.

But as Ms. Tadros indicated, we do have a plan for future reports to be updated based on the upcoming Commission proceedings. So that is how we're going to plan to unroll this initiative moving forward.

**MEMBER LACROIX:** Thank you. Thank you

very much.

**THE PRESIDENT:** Ms. Maharaj.

**MEMBER MAHARAJ:** Thank you very much.

This is a very interesting process change, and I'm excited to see how it works out.

I do have one small question, though, with respect to the timing. So you've indicated that the reports will be filed onto the website, but that if there is a gap between the last update and an actual proceeding, that staff will speak to the developments or updates at the actual hearing.

Is there any contemplation in your process for a filing as of the date it would normally be filed in the current process? So immediately prior to the proceedings so that somebody who might want to ask a question or intervene about that differential point would have advance notice of the content of that update?

**MS. TADROS:** Haidy Tadros, for the record. And thank you.

Yes. The timing I think will be an area of focus for CNSC staff as we launch this pilot. And as you've rightly noted, we are in the process of looking at how the EPR reports as currently planned in this new approach, as a stand-alone report to be posted and uploaded every time we receive an Environmental Risk Assessment from

the licensees.

For those situations where there is a large time period between when the last EPR report was posted to the Commission proceeding, as mentioned, what we're aiming to do -- and this is all dependent on the time frame -- we are aiming to ensure that we reference the EPR report that was recently done and include any updates that potentially may be of importance or of significance for the licensing decision in the environmental protection section of the safety and control areas.

So at no time will there not be a reference in the CMD to an EPR report. The updated information will be provided in the EP section of the safety and control area.

So what I'd like to do maybe is Dr. Kwamena can go over the different time frames and options that we were looking at in terms of how close are we to an actual Commission proceeding and what the process is for updating the EPR report that would already be available to the public.

**DR. KWAMENA:** Dr. Nana Kwamena, for the record.

I think this is a challenging question to answer in the sense that, you know, we have the best-laid plans to get these EPR reports out in advance of a

Commission proceeding. But as we've noted, they're also dependent on having an updated Environmental Risk Assessment. So we're doing our best to get those reports out in advance based on the reports that we have and the risk assessments that our staff have looked at.

So if there is a gap in between when we have a report published and when there's going to be a hearing, that information will be provided in the report.

In terms of providing precise timing for that, that's really hard to do at this particular stage, but we are trying to provide our interested parties with as much time as we can to look at this information, because that is what we've been hearing and that's something that we're really trying to address through this initiative.

**THE PRESIDENT:** And Ms. Maharaj, maybe I can add, in the event that there is another small piece that may help, is that what if this gap is from the last update of the EPR to the Commission proceeding coming up? That would be in a CMD that would be posted on the website and available to the public well in advance of the Commission proceeding. It happens right now. So they wouldn't hear about it for the first time at the proceeding.

**MEMBER MAHARAJ:** Excellent. Thank you very much, Madam Velshi.

**THE PRESIDENT:** Okay.

Dr. Demeter?

**MEMBER DEMETER:** Thank you for this report. I'm quite reassured with the statement that the CMD would reflect updates as necessary from the disconnect of the timing between the EPR and the hearings.

I applaud that this gets disseminated perhaps earlier to the public, as that's one of the, you know, most common criticisms of time to prepare and review the documents.

And I guess I have a broader question. Does this lead to a broader look at other information that CNSC may have that may get posted earlier? Like are there other -- this is the pilot for environment, but you know, the intervenors talk about a bunch of other information that comes. So is there a look or an opportunity to look at what other types of information might have the same structure to serve? I'm not sure who should answer that question or -- I just bring it up as a thought. I thought, you know, this is great. What else can we do this with?

**MS. TADROS:** Thank you. Haidy Tadros, for the record.

And I think that's absolutely correct. I think this pilot has allowed us to open up an opportunity where CNSC staff on a day-to-day basis go through a lot of

information. We do a lot of verification. We do a lot of assessments and a lot of evaluations. And I think one thing that we've learned over and over again is the public and Indigenous groups would like to see what exactly it is that CNSC staff are looking at, what our reviews come up with.

So any activity that we are currently -- regulatory activity that we're currently implementing would benefit from taking a look whether this approach is meaningful for that.

The ease to choose the EPR report is that it is already a very well-informed and very well-structured stand-alone report, as the Commission Members noted, that is typically appended to CMDs. So that was a quick way of being able to use this EPR report and try something different with the objective that I think if this works well and we can modify it, depending on the comments that we receive, we would pursue potentially other areas.

One thing I would note, though, is our initiative to try to put more information up for the public doesn't really start with just the EPR report. Some time ago for one of our power plant relicensing, we had a registry. We tried to post the back-and-forth that goes on between CNSC staff and the licensees to assure and provide some level of confidence that CNSC staff are going through

a very rigorous verification process as information gets submitted for licensing proceedings.

So we will continue to look for those opportunities. I think what the EPR report and this new approach affords us is that extra time as well, so everything is not linked solely to a Commission proceeding. The conversation starts any time CNSC staff have done verification and evaluation of a licensee's information and can, to a certain extent, put that information together, make it accessible, and put it out there for us to have a conversation on, whether it be through webinars or other outreach mechanisms that we currently have.

So a longwinded answer to say we are definitely going to be looking at other opportunities within the CNSC for how we put our information out. And we would hope that this pilot is successful, and that way we can continue this work of opening up what we do more so.

**MEMBER DEMETER:** Thank you very much.

**THE PRESIDENT:** Dr. Berube?

**MEMBER BERUBE:** Well, I'm a big fan of this approach. And I think that I want to see success in this, because it just speaks to the benefit of being able to electronically publish and distribute material, getting away more again from the paper form that we're used to, and still in this transitional process of actually moving in



this direction makes a lot of sense to me. And I think people are going to appreciate it.

The one question I do have is, because this is a pilot program, I just want to make sure that we're checking all our Web stats on a regular basis, you know, unique IP addresses, downloads, basically see if we're getting eyeballs on the sites. Because it's pointless to put it up if nobody's looking at it. So at this point, I mean, we really want to gather as much data as we can to see where it is.

Is there any kind of an idea as to what standardization you're going to get to in terms of how much in advance of a hearing are you going to start putting up this kind of thing, the ERP. Because you know, the complaint has been two months is not enough, but I mean like two years is crazy too, too in advance. So I mean there's got to be some sense of what is a reasonable approach here. I guess you're looking for that too.

**MS. TADROS:** Haidy Tadros, for the record.

Yes. And I think this pilot will help us get to what that looks like within the parameters of making sure that most updated information is available. Again, we don't want to get ahead of us ourselves and put information that is not updated on a regular basis. So we would be looking for those metrics.

As it currently stands, and as per our presentation, we have posted the EPR report. It was posted last week. We have it opened until July. The Commission Member Documents that will be available to the public and Indigenous groups is going to be coming out in I believe in September. And then the Commission proceedings will be in November. So when we look at that time frame, we'll have an EPR report that's been out from April to when the interventions are due for the Blind River Refinery, with the recognition that there will be more information and updated information if need be in staff CMD that will be available to the public as part of the Commission Member Documents that we posted.

So we're trying to use this pilot for a variety of different indicators to help sort of navigate the parameters we need to ensure are in place and successful for everyone. Obviously, our focus is the public and Indigenous groups.

The other aspect of our work that I neglected to mention is also the Independent Environmental Monitoring Program. Those reports are published at the end of each campaign, and they have been published for, well, some time now, since the IEMP program has been in place. So that again is another source of information that will be tied in to the EPR reports.

And it's all in hopes of getting more information out there and finding that right balance between getting all the information out there and as up to date as possible before the Commission proceedings so that the information can be used as the public and the Indigenous groups would like.

**THE PRESIDENT:** Okay, thank you, Commission Members. Any more questions?

And while we're waiting to give others a chance, so Ms. Tadros, are there any downsides with going ahead with this? Everything seems very positive. Any risks? Any extra level of effort that may question whether it's justified?

**MS. TADROS:** Haidy Tadros, for the record. I'd ask Dr. Nana Kwamena to outline some of the challenges that we were maybe foreseeing.

**DR. KWAMENA:** Dr. Nana Kwamena, for the record.

So one of the risks or challenges that we highlighted in our presentation was maybe the data being a bit stale, so as noted, that the report may have been published, you know, a year or so in advance, and so it might be viewed that the data inside is stale. But as we noted in our presentation, we think the benefits of providing this information and staff's assessment, well,

you know, is worth that risk or that challenge. And so we think it's worth proceeding with.

From a staff perspective, initially there will be a bit of additional work to get these reports written and posted online. We do have a catalogue of previous reports, so we're not starting from scratch for most facilities, but again, it will take some time to bring some of those up to speed and to get those posted online.

But again, this is something that we've been hearing from members of the public and Indigenous groups and other stakeholders, and so this is something we want to address. And so that extra effort of getting these reports written and posted I think again far outweighs the negative aspects in terms of some of that work.

So yes, there are going to be some negatives, but when we, you know, did that cost-benefit analysis, if you will, we felt that it was definitely worth pursuing and addressing this comment that we continually hear from our intervenors and stakeholders.

**THE PRESIDENT:** Excellent.

**DR. KWAMENA:** And also, I'd just like to make one small correction. The CMD for the Blind River Refinery will be posted in August 20th, not in September, so just wanted to make sure that was on the record.

**THE PRESIDENT:** Okay. Well, thank you.

Thank you very much for the presentation. Thank you for this most welcome initiative, and we look forward to hearing about the results of the pilot.

Before we move to our last agenda item for the day, let's take a short stretch break and resume at 2:30.

We'll see you shortly. Thank you.

--- Upon recessing at 2:20 p.m. /  
Suspension à 14 h 20

--- Upon resuming at 2:30 p.m. /  
Reprise à 14 h 30

**THE PRESIDENT:** Welcome back.

The last item for today is a preliminary report from CNSC Staff on a potential exceedance of the annual dose limit for a nuclear energy worker at Jubilant DraxImage.

I note that a representative from the licensee is expected to be joining us and should be available for questions.

Let me turn the floor over to CNSC.  
Ms. Owen-Whitred, over to you, please.

**Preliminary Report from CNSC Staff on a Potential  
Exceedance of the Annual Dose Limit for a  
Nuclear Energy Worker**

**MS. OWEN-WHITRED:** Thank you.

Good afternoon, Madam Velshi and Members of the Commission. My name is Karen Owen-Whitred. I'm the Director-General of the Directorate of Nuclear Substances Regulations.

With me are other CNSC staff who will be available to answer questions after this statement.

We are here today to provide a preliminary verbal report of an event recently reported to the CNSC.

In the morning of April 20th, 2021, the CNSC duty officer received a call from the Radiation Safety Officer, or RSO, from Jubilant DraxImage, a nuclear substance processing facility that makes iodine and other radio-isotopes for medical application, and which is located in Montreal, Quebec.

The RSO informed the duty officer that a vial containing iodine-131 was spilled inside a ventilated radiation-shielded box on April 19th. All staff wear personal protective equipment as required by the licensee's procedures, including respirators with charcoal-filtered masks, during the processing of this product.

The RSO was able to remove the vial and most of the contents of the vial in a lead pot. The lead pot was then transferred to the licensee's waste room for storage.

As a consequence of this spill and the nature of the nuclear substance, the ambient concentration of iodine-131 in the room quickly became elevated and all workers were evacuated. A portable iodine filtration unit was brought into the room to reduce the levels.

Two hours later, staff returned wearing personal protective equipment to perform the final clean-up.

All three of the workers involved in this event are nuclear energy workers.

Once clean-up was completed, all but one staff member involved in the clean-up had their thyroid screened to detect any intakes of radio iodine, and all results were below the instrument's detection limit.

The following morning of April 20th, the worker that did not conduct thyroid monitoring on the 19th underwent this monitoring. The worker's initial monitoring results were reported to be approximately 501 kBq of Iodine-131 in the thyroid. Based on this first monitoring result, this intake would equate to an effective dose of approximately 47 mSv.

There were seven additional thyroid monitoring results taken up to April 25th. From these results, the effective dose estimate by the licensee is currently 33 mSv.

The other two workers had their thyroids monitored after 24 hours, and their results were below the instrument's detection limit.

For context, the annual effective dose limit for a nuclear energy worker is 50 mSv. That's five zero.

CNSC Staff have been in daily communication with the licensee and are reviewing the preliminary information provided by the licensee. The worker is being monitored on a daily basis to refine the dose estimate, and the licensee has committed to provide daily results to the CNSC until April 29th.

Additional thyroid monitoring was scheduled on Monday, April 26th at Health Canada's Radiation Protection Bureau in Ottawa to confirm the licensee's dose estimate.

Due to the nature of the event and the magnitude of the intake, there is some concern that this exposure has the potential to cause future health effects to the worker. The licensee has also advised the employee to consult a physician to monitor their thyroid function.



Once the licensee has completed its investigation into this event and has submitted its final report to the CNSC, CNSC staff will then provide a full event report to the Commission.

This concludes our update on this event. CNSC Staff are now ready to answer any questions the Commission may have.

**THE PRESIDENT:** Thank you very much for that update. Let me open it up for questions, and we'll start with Dr. Lacroix.

**MEMBER LACROIX:** Thank you very much for this update.

Well, I have two obvious questions right now. The first question is, what was the rush to clean the room two hours after the incident?

And the second question, why was one of the nuclear energy workers was not checked on the day of the incident? What went wrong?

**THE PRESIDENT:** Who wants to answer?

**DR. LaFRANCE:** Yeah, this is Dr. LaFrance. Is Kamel Chettah on there? I think this is best responded by him.

**M. CHETTAH:** Oui. Est-ce que vous m'entendez? Are you hearing me? Yes?

**THE PRESIDENT:** Yes, we can.

**MR. CHETTAH:** Okay. So the first question was why --

**MEMBER LACROIX:** What was the rush for cleaning the room two hours after the incident?

**M. CHETTAH :** En fait, une fois que je suis arrivé sur place justement, j'ai évalué le risque d'émanation vers l'atmosphère à l'extérieur. J'ai d'abord mesuré... Nous avons (indiscernable) l'air dans la salle. Il y avait déjà un niveau relativement élevé de présence d'iode dans la salle, dans l'air de la salle, et donc, pour prévenir qu'il y ait un rejet dans l'atmosphère, j'ai pensé que... j'ai estimé que c'était plus judicieux de ramasser ça le plus rapidement possible et puis mettre tout confiner dans un sac pour empêcher justement qu'il y ait de la volatilité puis que ça arrive vers l'extérieur, vers (indiscernable).

Nous avons eu déjà un incident, pas similaire, mais un événement où on avait passé notre concentration de rejet dans l'atmosphère pour une semaine en 2019, vers la fin de novembre 2019, qui était dû justement au fait qu'il y avait une présence... il y avait un spill dans une boîte (indiscernable) ventilée, et ce spill-là, comme ça n'a pas été nettoyé rapidement, quoique dans le cas précédent on ne pouvait pas vraiment nettoyer, ça s'est retrouvé dans l'atmosphère à l'extérieur.

Donc, ma réponse c'est ça. C'est pour éviter qu'on contamine l'extérieur de la bâtisse.

**MEMBRE LACROIX** : Donc, cette salle n'est pas isolée?

**M. CHETTAH** : Si, elle est isolée. Elle est isolée.

**MEMBRE LACROIX** : Alors...

**M. CHETTAH** : Elle est fermée. La salle, elle est fermée.

Mais moi, ma réponse c'est pourquoi j'ai ramassé le pot avec le maximum d'activité, mis ça dans un sac rapidement, c'est pour éviter... parce que la boîte, elle est ventilée puis elle est reliée à des filtres, puis après ça va vers l'atmosphère, ça va vers l'extérieur.

**MEMBRE LACROIX** : D'accord.

**M. CHETTAH** : S'il y a une grosse activité à l'intérieur de la boîte, il y a un risque qu'on dépasse notre limite de rejet vers l'extérieur.

**MEMBRE LACROIX** : D'accord.

**M. CHETTAH** : C'est là que je me suis dit, il vaut mieux tout confiner tout de suite, mettre ça dans un sac, le fermer. Nous, de toute manière, pour ma part, j'étais bien protégé. C'est sûr qu'il y avait une exposition relativement acceptable par rapport à ça. C'est sûr que m'approcher ou rentrer mes mains dans cette boîte

pour faire cette manipulation qui a duré maximum moins d'une minute, à tout estimé là, mais vraiment, au moment où j'ai touché le pot et tout ça, c'était quelques secondes, mettre ça dans un sac et puis récupérer ça, mettre ça dans un chariot blindé, le pot, pour éventuellement le transporter vers une autre salle où on traite nos déchets.

**MEMBRE LACROIX** : Donc, il n'y aurait pas eu intérêt d'attendre quelques jours, le temps de la radioactivité...

**M. CHETTAH** : Non. Moi, si j'avais attendu, j'aurais eu un autre problème, j'aurais dépassé mes limites de rejet dans l'atmosphère. C'est certain que je l'aurais dépassé. C'est dans cet esprit-là.

**MEMBRE LACROIX** : D'accord.

**M. CHETTAH** : Pour la deuxième question, pour la prise de thyroïde là.

**MEMBRE LACROIX** : Oui.

**M. CHETTAH** : Oui.

**MEMBRE LACROIX** : Il y avait trois travailleurs?

**M. CHETTAH** : Oui.

**MEMBRE LACROIX** : Un travailleur n'a pas été testé.

**M. CHETTAH** : Oui, je crois qu'il y avait trois qui étaient directement impliqués dans cet événement.

Bon, le premier, c'est celui à qui est arrivé le spill. Donc, lui, il est sorti tout de suite de la salle. Il a averti son superviseur, qui m'a appelé. Lui, il a passé le test de thyroïde le jour même, parce que c'est arrivé comme le matin, avant-midi là. Donc, dans l'après-midi il a passé son test de thyroïde.

Moi aussi, à la fin de la journée, je l'ai passé.

Par contre, il y a un employé qui est mon assistant, lui, il l'a passé le lendemain uniquement.

Juste pour rappel, notre (indiscernable), la condition c'est de faire un test de thyroïde, un dépistage thyroïde 24 heures après un événement donné, après une situation où on suspecte qu'il y a quelque chose, entre 24 heures et moins de cinq jours. Nous, notre système est calibré pour trois jours. Alors, mettons que la dose qu'ils donnent là, c'est calculé comme trois jours auparavant. Mais dans un cas particulier comme ça où il y a un incident, on fait le test après 24 heures.

**MEMBRE LACROIX** : D'accord.

**M. CHETTAH** : Nos employés, ils ont pris cette habitude que... enfin, l'habitude. C'est une bonne pratique. À chaque fois qu'on suspecte qu'il y a un événement, qu'on est comme témoin d'un incident ou quelque chose, on prend la thyroïde dans la journée même, puis,

bien entendu, on le reprend (indiscernable). C'est-à-dire dans la journée même, ça donne quand même une indication. C'est sûr que la charge n'est pas maximale quelques heures après l'événement, mais on a déjà observé dans le passé des événements ou des situations où même une heure après on détecte déjà quelque chose dans la thyroïde.

**MEMBRE LACROIX** : D'accord.

**M. CHETTAH** : Le but de tout ça à l'origine c'était éventuellement d'administrer de l'iode stable. C'est-à-dire si on détecte quelque chose dès le départ là, on va administrer l'iode stable pour éventuellement bloquer la thyroïde. C'était ça l'idée. Mais pour nos calculs, pour nos procédures, c'est 24 heures après.

Donc, le travailleur qui n'a pas passé sa thyroïde le premier jour, bon, parce qu'il a fini vers 4 h de l'après-midi, il avait commencé assez tôt, il est parti directement. Lui, quand je l'ai questionné le lendemain, je lui ai dit : Pourquoi tu n'as pas fait la thyroïde? Il a dit que : Bon, parce que j'ai fini à ce temps, et puis, de toute manière, je devais le passer 24 heures après, le lendemain. C'est le lendemain matin qu'on a découvert qu'il était vraiment chargé.

**MEMBRE LACROIX** : D'accord. D'accord.

Donc, vous n'avez pas enfreint les règles de votre permis.

**M. CHETTAH** : Non.

**MEMBRE LACROIX** : D'accord. Je comprends.

**M. CHETTAH** : Non. C'est une bonne pratique de le faire le jour même.

**MEMBRE LACROIX** : D'accord. D'accord.

Thank you very much.

**MR. CHETTAH**: You're welcome.

**THE PRESIDENT**: Maybe we can get CNSC Staff to comment on this Licence Condition Handbook and why we would have that window for 24 hours and not require monitoring even when there could have been a potential uptake.

**MS. OWEN-WHITRED**: Karen Owen-Whitred, for the record.

I'd like to ask Mr. Sylvain Faille to provide some information about that particular licence condition.

**MR. FAILLE**: Sylvain Faille, for the record.

This licence condition is typically for normal operations where there's a suspicion there could be some uptake, but not for large emergency or advanced -- the nature that we'd seen yesterday -- or not yesterday, last week, sorry.

And right now, what we'll do, we'll look at clarifying that licence condition in the future, but

we'd like to pass the floor to Mr. Bertrand Theriault, who would have more information on the rationale for the 24-hour and immediate test on the thyroid.

**MR. THERIAULT:** Thank you. This is Bertrand Theriault, for the record.

So the reason for the timeframe of 24 hours to five days is -- really it's for routine monitoring, and this was chosen because the triggers in the licence, if a worker receives more than 10,000 Bq of I-131 in the thyroid, certain actions have to be taken.

This 10,000 Bq is related to a 1 mSv dose, but this is true only in the range of one to five days. Of course, it's a very good thing to monitor before a one-day timeframe has passed, but for routine monitoring the 10 kBq would not apply. They would have to be another number.

So this is the basis for the one to five days for routine monitoring of the thyroid.

**MEMBER LACROIX:** So from what I understand, the licence condition did not foresee such an event as far as testing is concerned. Am I right?

**MS. OWEN-WHITRED:** Karen Owen-Whitred, for the record.

So it is true that the licence condition is specifically focused on covering routine situations, and I'll just provide some opportunity in case colleagues in



radiation protection can speak to not the licence, but in terms of radiation protection regulations and the general coverage that we have for so-called non-routine situations.

**MS. PURVIS:** This is Caroline Purvis. I'm the Director of the Radiation Protection Division, for the record.

So I'd like to just complement the answers that have -- that have been provided.

So as Mr. Bertrand Theriault has indicated, the licence conditions is in place to detect sort of the small chronic intakes for workers under routine operation, so essentially it's done on a proactive and a precautionary basis. The objective is for timely detection and measurement of intakes that occur for workers that are exposed on an ongoing basis, but at low levels. It is not intended to be applied when there is an upset condition.

In those cases, the regulatory guidance is clear that a bio assay program should be triggered, and it would be -- the monitoring would be appropriate for the given type of intake.

These kind of non-routine bio assays would be done on a reactive basis when you suspect or you know that there's the potential for an intake that could result from, for example, an abnormal incident in the workplace, elevated airborne contamination such as occurred in this

instance.

I may just add that this licensee's radiation protection program, as I understand it, also calls for monitoring the same day, within two to four hours following a suspected intake.

So I hope that clarifies, and I'd be certainly happy to complement, if necessary.

**THE PRESIDENT:** Thank you.

Mr. Leblanc, did you want to say something? I saw your hand up momentarily.

**MR. LEBLANC:** Only just in case some of the participants were not aware, those Commission proceedings can be done in both official languages and you have an interpretation button as part of the Zoom session. It's the one at the right. That allows you to choose the language that you want to use.

I just wanted to clarify this for all participants. Thank you.

**THE PRESIDENT:** Thank you.

Dr. Demeter.

**MEMBER DEMETER:** Thank you. I had two questions.

One is more a clarification, and one is more something that I want to pursue.

But you've provided the effective dose of

47 going down to 33 mSv, and I think from a human health point of view, what is most important here is what is the actual thyroid dose, so what is the dosing grades to the thyroid or what is the equivalent dose.

The effective dose gives you a sense of dose limits, but the actual equivalent or dosing grades as well to the thyroid will be very helpful in prognosticating thyroid damage. So that would be a question I'd have.

The other one is, I'm a bit confused. You have a liquid iodine solution in a ventilated box and the concern was that it would -- the ventilation may go to the outer atmosphere. I still don't understand how the product got into the room if it's in a ventilated box that vents to the outside and, secondly, when we receive product from this company in my hospital, it is pH adjusted to significantly reduce volatilization.

It's not supposed to be volatile, so I don't -- was this product adequately pH adjusted and then how did it get out of the box into the room versus ventilating to the filters and maybe outside?

**M. CHETTAH** : Je peux répondre à ça, oui?

Alors, le produit, effectivement, le pH n'était pas encore stabilisé là. C'était quasiment de la matière première. Ça été transporté d'une salle de transfert vers une autre zone de production qui est classée

de grade C, mais c'est transporté dans une fiole fermée, dans un pot. L'incident qui est arrivé, en fait, c'est que dans une autre boîte où on effectue la mesure dans un dose calibrator, on mesure cette fiole-là. Au moment de mesurer la fiole, donc, on utilise des télémanipulateurs. En sortant la fiole, il y a un couvercle de plomb qui est tombé dessus puis il l'a brisée. C'est à ce moment-là qu'il y a eu toutes ces émanations. C'est à l'intérieur de la boîte. Mais ces boîtes-là, elles sont reliées à un système de ventilation qui est à part, qui a des filtres en haut là, puis après les filtres au charbon, ça va vers l'extérieur de la bâtisse. Donc, encore une fois, pour éviter qu'on dépasse la limite de rejet dans l'atmosphère à l'extérieur, on a préféré ramasser tout ça le plus vite possible. Mais la fiole était d'abord fermée. La fiole était scellée, puis elle a brisé suite, en fait, qu'il y a un pot de plomb qui est tombé dessus. Ça c'est... Est-ce que ça répond à la question?

**MEMBER DEMETER:** It does, in some sense.

And I guess the only other question I have right now is, there were three people involved and you said all wore PPE, including ventilatory protection.

**MR. CHETTAH:** M'hmm.

**MEMBER DEMETER:** In retrospect, how did this one person get contaminated and the other two not get

contaminated?

**M. CHETTAH** : O.K. Alors, ce qu'on suspecte, effectivement, c'est... Il y avait trois personnes directement impliquées. Tout le monde dans cette zone-là porte un respirateur avec une cagoule qui est munée de filtre au charbon. Ce qui est arrivé c'est que, bon, une fois qu'on a ramassé tous ces déchets-là, ces wastes-là, c'était autour de 1 300 millicuries, qui est quand même une activité considérable. Même si c'était dans un sac et puis dans un pot, il fallait transporter cette quantité de waste vers un autre endroit. Le problème qu'on a c'est qu'en sortant de cette zone, on enlève le respirateur. Parce que c'est une zone classée safe, donc, le respirateur, il reste à l'intérieur dans le gowning area pour entrer dans cette zone. Donc, la personne qui est allée se débarasser des wastes, des déchets dans la salle des wastes, elle a transporté le chariot des wastes. Ce n'est pas une grande distance là, c'est juste un petit corridor à traverser. Elle a transporté son masque et puis elle a transféré ces wastes-là vers le bunker où on stocke ces wastes, son masque, et c'est probablement à ce moment-là que c'est arrivé. Ça l'a duré... Toute cette opération, ça l'a duré une minute là, le temps de... avec le chariot, je veux dire là, le chariot, transporter et puis l'emmener dans une autre salle, prendre le sac et le

jeter dans le bunker. Puis après, il est revenu dans la zone où il faut porter le masque. Il a porté son masque. Donc, après investigation, je suis presque cent pour cent convaincu que c'est arrivé pendant le traitement des déchets, pendant le transfert des déchets dans la salle des wastes, parce que c'était le seul moment où il ne portait pas le respirateur, le masque. Puis tous les autres employés qui étaient à l'intérieur de la zone où ça s'est produit, où cet événement s'est produit, portaient le masque, puis ils n'ont pas eu de charge thyroïdienne.

**MEMBER DEMETER:** Okay. Thank you.

I'll probably have more questions when the detailed report comes in the next time around, including the actual thyroid dose, which I think is really important.

Thank you.

**MS. PURVIS:** Caroline Purvis, for the record.

Dr. Demeter, did you want us to give you a sense of what we see as the --

**THE PRESIDENT:** Dr. Berube, please.

**MEMBER BERUBE:** I'm going to hold my questions until the IR is complete so I have a better sense of what's going on for sure.

**MR. LEBLANC:** So Dr. Demeter, if you want staff to complete the answer, please, and also to take

over -- I think having some problem with the connection for some participants.

**MEMBER DEMETER:** I mean, if staff has a thyroid dose estimate, that would be great.

**MS. PURVIS:** Caroline Purvis, for the record.

So I'm going to start and then pass it to Bertrand Theriault.

So what the CNSC has been doing with the daily information that the licensee is providing is looking at ICRP curves and the expected excretion of this type of intake and then fitting the results on the curve.

As of today, the effective dose that we're looking at is approximately 30 mSv and the organ equivalent dose is approximately 590 mSv.

But I'll let Mr. Theriault, who's been doing the work, to maybe just elaborate a little bit and, if you wish, we can also just give you a confirmation of what Health Canada has seen.

**MEMBER DEMETER:** I'm actually good with that for now as a start and then, with the detail report. I'm just -- it just sort of sits in my mind what the risks of hypothyroidism is for this patient. And of course, it's a committed dose because of the residency time.

But that's good for now. Thank you.

**MR. LEBLANC:** So Dr. Berube, please.

**MEMBER BERUBE:** I'm just going to reserve my questions until the IR is finished and the full investigation is done and take a look at it then.

**MR. LEBLANC:** Okay, thank you.

Any questions from the other Members?

**THE PRESIDENT:** Marc, I have some questions, please.

**MR. LEBLANC:** Yes.

**THE PRESIDENT:** I'm back. I just had to switch my devices.

Maybe to ask DraxImage, how is the worker doing and what's his anxiety level and how are you providing him reassurance?

**M. CHETTAH :** Je n'ai pas compris la question.

**THE PRESIDENT:** How is the worker himself doing? You know, he's picked up this heavy dose.

In my last 10 years as a Commission Member, this is the most serious incident we have encountered of someone coming close to exceeding a dose limit, so I wanted to know how is the worker doing? Are you providing him reassurance? What's his mental state? Is he worried? Is he concerned about his health?

**M. CHETTAH :** Je pense qu'il est rassuré.



C'est quelqu'un quand même qui a un background en radioprotection. Il a une formation Health Physics. Donc, il comprend un petit peu le relativisme de la dose. Il fait, par exemple, que c'est moins qu'une dose pour une capsule diagnostique là pour un patient, pour quelqu'un qui subit un examen diagnostique. Il a pris... Comme j'ai dit, c'est quelqu'un qui est dans le domaine. Il connaît... Il comprend ce qui arrive là. Il sait aussi que c'est des limites beaucoup plus réglementaires. Ce n'est pas nécessairement des limites pour sa santé, sécurité. C'est sûr qu'il y a un risque qui est plus élevé du fait que sa dose thyroïde dépasse les 500 mSv, mais il est... moi, je pense qu'il est serein et puis il suit ça de près là, et puis il comprend cette dose-là. Ce n'est pas... L'avantage en fait dans cette malchance c'est que c'est quelqu'un qui comprend la radioprotection, Health Physics. Donc, il le prend quand même de façon assez sereine.

**THE PRESIDENT:** Merci. Thank you.

**MR. CHETTAH:** You're welcome.

**THE PRESIDENT:** Ms. Maharaj?

**MEMBER MAHARAJ:** Thank you, Madam Velshi.

It seems, I think, coincidental that this particular worker was the one who didn't get his thyroid test until the next day, but my question is, would his

treatment and the intervention on his behalf have been any different if he had been tested on the day of the incident rather than the day following?

**M. CHETTAH** : C'est sûr que si on a détecté quelque chose le premier jour, c'est sûr que ce ne serait pas le maximum, on n'aurait pas détecté ce qu'on a détecté 24 heures après. Si on avait vu qu'il y avait quelque chose dans sa thyroïde, si c'était à refaire, on aurait peut-être envisagé l'administration de l'iode stable pour bloquer la thyroïde et puis éviter qu'il ait comme une charge supplémentaire. Je pense que c'est ça qu'on aurait pu comme envisager.

Mais encore une fois, le premier jour il n'y avait pas d'évidence claire qu'il y avait une contamination de personne, surtout que la personne avec laquelle est arrivé le spill, c'est-à-dire quand la fiole a brisé, puis moi-même qui a fait comme le plus gros, j'ai ramassé le plus gros de l'activité, comme nous-mêmes, il n'y avait pas rien dans la thyroïde, il n'y avait aucune évidence qu'il y a quelque chose chez l'autre employé. C'est pour ça que suite à la réflexion, j'y ai pensé comme toute une journée, le jour d'après j'ai passé séquence par séquence, à quel moment ça aurait pu arriver, et c'est à ce moment-là que j'ai identifié que ça aurait pu arriver uniquement au moment où il est sorti, où il a enlevé le

masque. Mais encore une fois, la veille il n'y avait pas d'évidence qu'il y a eu comme une prise comme ça de charge.

Puis c'est sûr qu'on apprend de tout. Ça arrive... C'est arrivé probablement très, très vite là. C'est sûr qu'en prenant le sac, il y a, comme j'ai dit, plus d'un curie d'iode pas stabilisé là. C'est très, très volatile. Mettre ça... Même si on prend des pinces pour ça, le mettre dans un autre contenant c'était apparemment suffisant pour qu'il y ait comme une bouffée qui a fait que ça l'a chargé, ça pris quelques heures là puis ça s'est montré dans sa thyroïde.

**MEMBER MAHARAJ:** Thank you.

One follow-up question. Was there anybody else in the corridor door or in the vicinity of the sample when this particular worker took off his mask or was he totally alone? Is there any risk to anybody else?

**M. CHETTAH :** Non, il n'y avait pas nécessairement des gens autour. Mais juste pour complément de réponse, tous les employés ont passé le... même ceux qui étaient indirectement liés à cet événement, qui étaient loin de cet événement, tout le monde -- de toute façon, c'est nos procédures -- ils passent un test de thyroïde.

**MEMBER MAHARAJ:** Okay.

**M. CHETTAH :** Donc, cet événement, c'est arrivé le lundi. Le mercredi, tout le monde en production

passe le test de thyroïde. Puis, bon, ceux qui étaient impliqués c'était 24 heures après. Et puis le mercredi puis le vendredi. Ils passent deux tests par semaine, le mercredi et le vendredi, pour s'assurer de couvrir toujours comme trois jours en arrière. C'est ça un peu notre procédure. Et puis tout le monde a entendu qu'il y avait un spill. C'est sûr que ça va... on communique ce genre d'information. Donc, la majorité des employés ont passé le jour d'après leur thyroïde. C'était déjà négatif. Et puis ceux qui l'ont passé le mercredi c'était négatif aussi.

**MEMBRE MAHARAJ :** D'accord. Merci beaucoup.

**M. CHETTAH :** Je vous en prie.

**THE PRESIDENT:** Thank you.

Dr. McKinnon...?

**MEMBER MCKINNON:** Yes. Most of my questions have been answered, but I am just curious in general. This is a question for CNSC staff, would be that when there is a spill, in this case it is of iodine, does the procedure generally dictate a certain time for ventilation? I am just wondering about how the determination is made to reenter. Is there a requirement to monitor air concentrations by some instrument at all or is it, as in this case, a judgment call? How is that determination normally made?

**MS. OWEN-WHITRED:** Karen Owen-Whitred, for the record.

If you will just allow me a moment to consult with my colleagues and if you -- in the meantime if you are looking for some more specific details related to that procedure the licensee might be better placed to provide that information.

**THE PRESIDENT:** DraxImage, do you want to try --

**M. CHETTAH :** Oui. Alors, nous, pour l'échantillonnage de l'air, on ne le fait pas de façon systématique, on le fait suite à des événements, suite à des... Quand on suspecte qu'il y a un rejet à l'extérieur de boîte ventilée, on fait un échantillonnage d'air et puis on détermine la concentration d'iode dans l'air. Si ça dépasse nos procédures internes, si ça dépasse 1 DAC, on évacue la salle jusqu'à ce que ça baisse à moins que 1 DAC. Parce que ce n'est pas partout dans le laboratoire où il y a l'obligation de porter un masque, un masque au charbon. Il y a certains endroits où c'est obligatoire. D'autres endroits on peut circuler sans masque. Donc, c'est pour ça que si on suspecte quoi que ce soit, on fait un échantillonnage d'air. En dessous de 1 DAC... En fait, entre .01 et 1 DAC, on doit travailler avec un masque. Si c'est supérieur à 1 DAC, on évacue. Ça c'est nos

procédures à l'intérieur, internes. Dans ce cas-ci, c'est sûr que moi, j'ai... personnellement, j'ai fait l'intervention dans un environnement où il y avait plus que 1 DAC. C'était autour de 36 DAC qu'on a mesuré tout à fait au début là. Parce que la première chose que j'ai faite quand je suis arrivé là, j'ai mis l'échantillonneur à l'intérieur de cette salle, puis on est resté loin le temps d'échantillonner. On a eu le résultat, et puis ça révélé 36 DAC la première mesure. C'est à ce moment-là qu'on a apporté une unité de filtration qui est mobile. Donc, on l'a déplacée, on l'a installée là, et puis ça réduit au bout de quelque temps -- je pense c'est un peu plus d'une heure là, presque deux heures même -- ça réduit la concentration à un niveau qu'on a jugé acceptable, c'est-à-dire qui est de l'ordre de 5 DAC.

Tout ça étant, on porte quand même des masques. On porte... Donc, il n'y a pas... Dans des situations d'urgence, des situations d'intervention, il n'y a pas de limite pour la concentration d'iode dans l'air, mais en temps normal, en temps de routine, régulier, si ça dépasse 1 DAC, nous évacuons l'endroit jusqu'à ce que ça baisse à moins que 0,1 DAC. Parce qu'entre 0,1 et 1 DAC, dans nos procédures, on est tenu de porter un masque.

**MS. OWEN-WHITRED:** Karen Owen-Whitred, for the record.

If CNSC staff can assist in providing -- not adding to the detailed site-specific information that we have just received but more of a generic how would we expect a response to spills. I will turn to Ms. Caroline Purvis to see if she can offer anything further on that subject.

**MS. PURVIS:** Thank you.

Caroline Purvis, for the record.

So the CNSC would expect as part of the licensee's Radiation Protection Program that they have responses for upset conditions, so that is actually prescribed in the Regulations. And what an upset condition would mean would be site-specific. It would depend on a spill of an open source material. There would be differences of course from nuclide to nuclide. In this case, because they are handling open-source iodine-131, which is, depending on what its form is, its chemical form, it can be quite volatile. What that means is it can disperse in the atmosphere quickly and be inhaled by a worker. So if we sort of keep this at a generic level, the expectation is if a licensee was handling this kind of material, they should have response protocols in place in the event of a spill. That would mean whether it would be air monitoring to determine the safety of entering the room, different personal protective equipment if it was

deemed necessary to enter the room, et cetera.

Going back to the earlier question about sort of why go in after two hours, the half-life of this particular nuclear substance is eight days. So what that means is it would take eight days for the initial amount of the spill to reduce by half. So given that it wasn't going to disperse quickly or decay quickly, the licensees presumably felt that it was necessary to go in and clean it up.

So at a general level that would be the expectations, licensees would set their program up and then ensure that the response is protective of worker health.

**MEMBER MCKINNON:** Yes. And CNSC reviews all of their proposed programs and the responses as part of the licence conditions?

**MS. OWEN-WHITRED:** Karen Owen-Whitred, for the record.

That is correct.

**MEMBER MCKINNON:** Yes. Yes.

**MS. OWEN-WHITRED:** We would review licensee procedures as part of our licence check.

**MEMBER MCKINNON:** Okay. Thank you very much.

**THE PRESIDENT:** I'm not sure if I missed this when I was having some technical issues, but what were



the results of the Health Canada monitoring of this leak?

**MS. OWEN-WHITRED:** Karen Owen-Whitred, for the record.

I am not sure that we have those results at present. I will maybe turn to the licensee to see if --

**M. CHETTAH :** J'ai reçu...

**MS. OWEN-WHITRED:** Please.

**M. CHETTAH :** J'ai reçu un résultat ce matin de l'analyse qui a été faite hier, et puis tout indique que nous avons overestimate... nous avons surestimé la dose de notre côté. Donc, j'ai refait les calculs avec l'activité qu'ils ont calculé, eux, pour la journée d'hier, le 26. Ça donnerait une dose autour de plus de 25 mSv, au lieu de 30. Mais ça c'est une... Santé Canada, ils ont demandé à ce que vendredi aussi, vendredi prochain que l'employé aille faire une autre mesure pour confirmer leur valeur. Mais il semble que nous avons surestimé la dose d'environ 10 pour cent.

**THE PRESIDENT:** Thank you.

And I recognize this is only an initial report of this event, so we do look forward to the full report after the investigation.

My question to staff, though, is given perhaps the lack of clarity or understanding around requirements for thyroid monitoring following an upset

condition, are there immediate actions that need to be taken?

**MS. OWEN-WHITRED:** Karen Owen-Whitred, for the record.

In a moment I will turn to Monsieur Faille for an additional response to this question. I would again reiterate that this is an initial report that we are providing to the Commission, so we don't yet have all of the facts.

We do believe that the licensee is in a safe state right now. If we did not believe that or if we believed that there were uncontrolled risks to the workers, we would absolutely take immediate action, but we don't feel that that was necessary at this time.

And if I could turn to Monsieur Faille to provide a little bit further context on that.

**MR. FAILLE:** Sylvain Faille, for the record.

As Mrs. Owen mentioned, we don't see an urgent need about the context of the licence condition, but we are certainly going to review the wording and make sure that it is clear. And if we need to add something, we will modify the licence condition and inform all the licensees that would be affected by the licence condition on their licence of the change to it. That would be something that

we would need to do in the next couple of weeks, to look at the wording and what happened with this event and see if there is any clarity that could be added to the licence condition.

**THE PRESIDENT:** Let me just share you my perspective. Here is the licensee, he is the RSO, he is the one that makes the decisions, he is the one who knows what their procedures are. They had an incident, a similar incident in 2019, they had one just a couple of weeks ago -- not even a couple of weeks ago, and he believes that their practice is you can wait 24 hours before you get your thyroid monitor, even in an upset condition. Do you not think that one should reiterate: No, until your investigation is over, here is the regulator's expectation, if there is an upset condition, thyroid screening immediately? Like is that unrealistic? Is that an expectation that one shouldn't be reinforcing?

**MS. OWEN-WHITRED:** Karen Owen-Whitred, for the record.

First of all, yes, that is an expectation that licensees -- of which licensees should be aware. I am not yet certain that with the response that we received from the licensee, I don't believe that there is a misunderstanding on that part. I believe that there was an understanding that this monitoring should have been done

sooner and, as we have heard, that the individual involved was following what they thought, you know, was the correct procedure for routine operation, but not for a spill condition. So because we don't yet have that full report, I don't know that we are dealing with in this case an RSO who does not understand the expectations or an individual who was not following those expectations.

**THE PRESIDENT:** Well, let me ask the RSO then.

This was an upset condition. Do you believe that your requirement is for the individual to have monitored the same day?

--- Pause

**THE PRESIDENT:** Mr. Chettah, are you there?

--- Pause

**THE PRESIDENT:** Oh, I don't know if we have lost him.

Is Dr. LaFrance there?

**DR. LaFRANCE:** Yes, I'm here.

Kamel, did you hear the question about the procedure in question?

It is my understanding it is very well understood at the site of the procedures necessary for monitoring under both routine conditions and under spill

conditions. I think the CNSC staff who have commented are correct in their observations. With any past audit reviews I believe we have earned their confidences for an operation that is very well conducted and our investigation is ongoing.

I'm not sure if Kamel, ma'am, heard your question. Perhaps repeat it and he could answer it in further detail or I will give you further detail.

**THE PRESIDENT:** Thank you.

**DR. LaFRANCE:** You're welcome.

**THE PRESIDENT:** Mr. Chettah, early on when you were asked about why this third worker who had the higher uptake did not monitor on the same day as the incident, you said that is consistent with your licence in that one is not expected to monitor for, you know, 24 hours after. But given that this was an upset condition, not routine, I was just questioning, does your procedure require the individual to monitor the same day and was this something that the individual didn't do because he either didn't think it was an upset condition, though clearly it was given the levels you had reached, but it was just wanting to make sure that you understood what the expectations are for thyroid monitoring if there has been a non-routine condition or an event?

**M. CHETTAH :** Quand il y a un événement non

routinier... Si un événement non routinier se produit, la pratique, les procédures à l'interne c'est de passer... bon, impliquant, bien sûr, de l'iode radioactif, on passe un examen de thyroïde une heure plus tard, dans l'heure qui suit ou les deux heures qui suivent, dans la même journée, disons. Mais systématiquement, on le passe le lendemain aussi, 24 heures après. C'est ça nos procédures à l'interne.

Encore une fois, dans le cas de cet événement, il y a deux personnes sur trois qui l'ont passé, puis la troisième ne l'a pas passé, prétextant qu'elle avait fini tard et puis que, de toute manière, elle devait passer le lendemain. C'est ça. Parce qu'on lui a posé la question : Pourquoi tu n'as pas passé l'examen le jour même? Il faut savoir que la machine thyroïde est située à un autre bout de l'usine. Ce n'est pas la même place. Ce n'est pas dans le laboratoire où ils font la production qu'il y a la machine thyroïde. Elle est située un peu plus loin pour des mesures... pour des raisons de background et tout ça là. Il faut vraiment un endroit où il n'y a pas de radioactivité. C'est là qu'on fait les examens pour la thyroïde. Donc, il n'est pas allé. Il n'est pas allé passer sa thyroïde à la fin de son quart, de son shift le premier jour, sachant que c'est le lendemain qu'il devait le faire.

Mais je suis entièrement d'accord que nous devons corriger cette situation. Nous devons mettre une procédure très claire que si on suspecte un événement particulier où il y a risque de rejet d'iode, nous devons absolument passer un examen de thyroïde dans les heures qui suivent l'événement, l'événement suspecté. Ça, ça va être définitivement clarifié.

**MS. OWEN-WHITRED:** So, Madam Velshi, if I may -- Karen Owen-Whitred, for the record.

To provide some assurance to the Commission, we are in daily communication with the licensee with respect to this event. We will validate the assumption that I mentioned earlier, that, you know, our understanding of the licensee's understanding of the approach of the seriousness of event or the procedures that are required and if we have any reason to believe that there is some doubt as to that assumption, we will take immediate action on behalf of CNSC staff.

**THE PRESIDENT:** I appreciate that. Thank you.

Dr. Demeter...?

**MEMBER DEMETER:** Thank you.

I just wanted to comment that this was an exceptional circumstance of a spill of very high activity of a volatile radionuclide which is breathable and the

opportunity to intervene with stable iodine, KI, after exposure is literally within hours of the exposure if you don't take it before. In this case that opportunity was missed and the worker left. So in this case his thyroid dose could have been totally prevented. So either you have a routine that anyone who gets in an ambient airborne radioiodine situation takes KI prophylactically and gets tested or you test them within an hour, because after an hour the protective measures of KI after the fact go down precipitously. So I am a bit concerned at the big picture here and hopefully we will hear more about it with the full -- but there was an opportunity missed to prevent a significant thyroid exposure. That is the comment and hopefully we will sort that out in the bigger picture.

**THE PRESIDENT:** Right. Thank you for that, Dr. Demeter.

So with that, staff, we look forward to the full report once the investigation is over and we get their findings and recommendations from that. Of particular concern is because this was an individual who has the appropriate background to appreciate not only the risks but what are some of the mitigation measures of extra concern and that there has been a previous incident as well. But thank you for the update and we look forward to getting more on this.



So this concludes the public meeting of the Commission. Thank you all for your participation.

Stay safe, stay well. Bonne fin de journée. Au revoir.

--- Whereupon the meeting concluded at 3:24 p.m. /

La réunion est terminée à 15 h 24