Canadian Nuclear Safety Commission

Commission canadienne de sûreté nucléaire

Public meeting

Réunion publique

February 4th, 2015

Le 4 février 2014

Public Hearing Room
14th floor
280 Slater Street
Ottawa, Ontario

Salle des audiences publiques
14e étage
280, rue Slater
Ottawa (Ontario)

Commission Members present

Dr. Michael Binder
Mr. Dan Tolgyesi
Ms Rumina Velshi
Mr. André Harvey

Commissaires présents

M. Michael Binder
M. Dan Tolgyesi
Mme Rumina Velshi
M. André Harvey

Secretary:

Mr. Marc Leblanc

Secrétaire:

M. Marc Leblanc

General Counsel:

Ms Lisa Thiele

Avocate générale :

Me Lisa Thiele

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Ottawa, Ontario

--- Upon commencing on Wednesday, February 4, 2015
at 2:07 p.m. / La réunion débute le mercredi
4 février 2015 à 14 h 07

CMD 15-M1

Opening Remarks

M. LEBLANC : Bonjour, Mesdames et Messieurs. Bienvenue à la réunion publique de la Commission canadienne de sûreté nucléaire.

We have simultaneous translation. Please keep the pace of speech relatively slow so that the translators have a chance to keep up.

Des appareils de traduction sont disponibles à la réception. La version française est au poste 2 and the English version is on channel 1.

Please identify yourself before speaking so that the transcripts are as complete and clear as possible.

La transcription sera disponible sur le site Web de la Commission dès la semaine prochaine.

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.

Please silence your cell phones and other electronic devices.

Monsieur Binder, président et premier dirigeant de la CCSN, va présider la réunion publique d'aujourd'hui.

President Binder...?

LE PRÉSIDENT : Merci, Marc.

Good afternoon and welcome to the meeting of the Canadian Nuclear Safety Commission.

Mon nom est Michael Binder. Je suis le président de la Commission canadienne de sûreté nucléaire.

Je vous souhaite la bienvenue and welcome to all of you joining us via the webcast.

I would like to start by introducing the Members of the Commission that are here with us today.

On my right is Monsieur Dan Tolgyesi;

On my left are Ms Rumina Velshi and Monsieur André Harvey.

We have already heard from our Secretary Marc Leblanc.

We also have with us Ms Lisa Thiele, Acting Senior General Counsel to the Commission.

MR. LEBLANC: The *Nuclear Safety and Control Act* authorizes the Commission to hold meetings for

the conduct of its business.

Please refer to the agenda that was published on January 22nd, 2015 for the complete list of items to be presented today.

In addition to the written documents reviewed by the Commission for this meeting, CNSC staff will have an opportunity to make presentations and Commission Members will be afforded an opportunity to ask questions on the items before them.

I would also like to note that we don't have a full Commission today but we do have a quorum of the Commission.

And also, finally, for the record, it is noted that following a discussion of the so-called bystander effect at the October 1st, 2014 Commission Public Meeting the Commission received further information from CNSC staff on this topic.

The Commission Members have requested that a further discussion of this matter take place at a future public proceeding of the Commission with more detailed elaboration of the distinctions on the four main radiation risk models -- the Hypersensitivity Model, the Linear-Non-Threshold Model, the Threshold Model and the Hormesis Model -- and the relationship to the bystander effect.

The Commission has tentatively scheduled this presentation to take place during the planned June 17-18 Commission proceedings but it is for staff to identify a specific date once they are ready to present.

Mr. President.

THE PRESIDENT: Just if I may add colour to this file comment.

I found the actual briefing note very interesting. It's the first time in which I've seen all those models in one place. So we would like some more information in there and I think this is kind of information that we may want to consider to actually put on our website, explaining the various models that are running around internationally.

CMD 15-M2

Adoption of Agenda

THE PRESIDENT: Okay. With this information, I would like to call for the adoption of the agenda by the Commission Members, as outlined in Commission Member Document CMD 15-M2.

Do we have concurrence?

For the record, the agenda is adopted.

CMD 15-M5

Approval of Minutes of Commission Meeting

held December 17-18, 2014

THE PRESIDENT: Next, I would like to call for the approval of the Minutes of the Commission Meeting held on December 17 and 18, 2014, as outlined in CMD 15-M5.

Any comments, additions, deletions?

I note that there are no changes. Therefore, for the record, first of all, do we have concurrence?

Okay. So for the record, the Minutes are approved.

CMD 15-M3

Status Report on Power Reactors

THE PRESIDENT: We'll move on to the Agenda and the first item for today is the Status Report on Power Reactors, which is under CMD 15-M3.

I understand that we have a representative from OPG online.

Mr. Gregoris, can you hear us?

MR. GREGORIS: Yes. This is Steve Gregoris here, Director of Operations and Maintenance at

Darlington.

THE PRESIDENT: Thank you.

I understand that Mr. Jammal, you will start the update.

M. JAMMAL : Bonjour, Monsieur le Président.

For the record, it's Ramzi Jammal, Executive Vice-President and Chief Regulatory Operations Officer.

Alors, premièrement, bonjour, Monsieur le Président, Membres de la Commission. Je voudrais vous signaler un changement de personnel au sein de la Commission, surtout dans la Direction de la réglementation des centrales nucléaires.

Mr. Barclay Howden, who is in the front seat, has been appointed as the Director General to lead the Directorate of Power Reactor Regulations.

So we welcome back Barclay and especially for him to be in front of the Commission presenting multiple upcoming important files. And Barclay, Mr. Howden, is no stranger of being in front of the Commission.

Mr. Howden is replacing Dr. Rzentkowski, who will be leaving us on March 15th to take a post at the International Atomic Energy Agency, the IAEA. Dr. Rzentkowski has been appointed by the Director General of

the IAEA as the Director of Nuclear Safety, which is one of the key divisions at the IAEA. He will lead the international nuclear community, through the IAEA, for the enhancement of global nuclear safety regimes around the world.

So I would like to formally thank Dr. Rzentkowski for his leadership in DPRR and his exemplary service at the Commission. So all of us as Canadians, we are proud of Greg's appointment. We will miss him and I will personally miss my technical debates, sometimes heated, with him, but we wish him all the best in his new endeavour and challenges.

Maintenant, je cède la parole à monsieur Howden to provide you with the status report on power reactors.

Thank you, Mr. President.

THE PRESIDENT: Well, on behalf of all of us here at the Commission, we wish all the best to Dr. Rzentkowski. We will continue to have heated debates with him. We expect big things to happen in the IAEA with all the things that you learned in Canada. I'm being obviously sarcastic a bit. So all the best to you.

And welcome to Mr. Barclay Howden. You are a veteran of this craft, so we're looking forward again to interesting new presentations.

Over to you.

MR. HOWDEN: Thank you very much.

Good afternoon, Mr. President, Members of the Commission. For the record, my name is Barclay Howden.

I would like to update the Commission on developments pertaining to CMD 15-M3 that have occurred since this CMD was submitted on February 2, 2015.

There is an update to section 1.1, Bruce A. Bruce A Unit 3 is now operating at 87 percent of Full Power.

We also have an update to section 1.2, Bruce B. Bruce B Unit 6 is now operating at 93 percent of Full Power.

I will now ask Daniel Desjardins, Acting Director, Darlington Regulatory Program Division, to provide two updates to you on section 1.3, Darlington.

MR. DESJARDINS: Thank you, Mr. Howden.

Daniel Desjardins for the record.

The first Darlington update is that Unit 4 is now at Full Power.

The second Darlington update concerns the worker injury that occurred on January 30, 2015 and involved work on the piping for the auxiliary heating system.

OPG promptly notified CNSC staff and the

Ontario Ministry of Labour.

OPG submitted a preliminary written report to CNSC staff on February 2, 2015.

OPG is conducting a root cause investigation and will submit a detailed event report to CNSC staff.

CNSC staff continue to be in communication with OPG and the Ontario Ministry of Labour regarding this event.

Information has been posted on the licensee's and CNSC's Web sites. OPG staff is connected to provide additional details.

This concludes the Darlington updates.

MR. HOWDEN: Thank you, Mr. Desjardins.

We also have an update on section 1.6, Point Lepreau.

As Commission Members may be aware, the area surrounding the Point Lepreau Generating Station is experiencing a series of severe winter storms.

CNSC staff has confirmed that New Brunswick Power has implemented appropriate measures to deal with severe winter weather. These measures include provisions to maintain access to the site in order to ensure appropriate staffing levels are maintained. The station has continued safe operation throughout this series

of severe winter storms.

This concludes the Status Report on Power Reactors. CNSC staff are now available to answer any questions the Commission Members may have.

Thank you.

THE PRESIDENT: Thank you.

So let's start with the question period with Ms Velshi.

MEMBER VELSHI: Thank you, Mr. President.

I have a question on the Darlington event and I don't know whether staff or OPG can provide more details on the injury and exactly how did the worker suffer the broken arm incident.

MR. HOWDEN: Barclay Howden speaking.

I suggest that our OPG representative provide that information.

MR. GREGORIS: This is Steve Gregoris, Director of Operations and Maintenance at Darlington.

For the record, the Auxiliary Heating Steam Project is a new installation onsite. It's done by contract partners through E.S. Fox.

A large pipe, so a 12-inch diameter pipe, 25 feet in length, was lifted and installed on hangers in the lower elevation, 92.5 elevation, of the plant and was sitting on hangers in an installed position. That pipe

needed to be rotated to mate up with an existing pipe and then welded into position.

The pipe was being rotated using rigging. It was not supported in any way because it was on its -- it was supported by its hangers. And as that pipe was rotated into the position from a six o'clock to a three o'clock position one of the two hangers supporting the pipe broke and one end of the pipe fell and swung and, as it came to a resting position, pinned an individual, their right arm between the pipe and an adjacent support beam for the station structure.

The individual suffered 13 stitches due to a laceration to their bicep. The individual did not have any significant blood loss and was conscious and taken to hospital. At the time they were diagnosed with a broken arm between the elbow and the shoulder and the individual went home the same evening to recover with his family.

The individual has come back to work, returned to work yesterday, so on Tuesday, February the 3rd, and is on light duties. The individual does not have a cast and follow-up visits with the doctor are occurring to further diagnose and confirm a break actually occurred. For now, we've reported it as a broken arm between the elbow and the shoulder.

MEMBER VELSHI: Thank you.

And is the Ministry of Labour also conducting an investigation into this incident?

MR. GREGORIS: Again, for the record, the Ministry of Labour is conducting an investigation. Unfortunately, with the weather that we've seen this week and also a large accident that happened this morning, they've been delayed coming to site but they are pursuing an investigation.

MEMBER VELSHI: Thank you. Thank you.

THE PRESIDENT: How heavy was this pipe? How heavy is this pipe and could it have been a much more serious accident if it fell directly on the individual?

MR. GREGORIS: Again, Steve Gregoris for the record.

So I don't have an exact weight for the pipe. It was of significant weight and depending on circumstances, it could have been a worse situation, you know. What I will say is this is a significant event for the site. We are taking the event very seriously and, as indicated earlier, there's a full root cause to understand what happened.

There's also a -- there's been a stand-down with the contract group to understand worker practices, supervisory oversight, and we are letting that work group go back to site with compensating measures in

place on a graded approach and we'll track performance to ensure that they can continue to work on the site.

THE PRESIDENT: Okay. Thank you.

Ms Velshi?

Monsieur Harvey?

MEMBRE HARVEY : Merci, Monsieur le Président.

Juste une question à propos de Bruce B.

We can see that Bruce B is -- there is some limitation to the nominal output design, design output to maintain safety analysis, which is not the case for Bruce B.

My question is how and when are established such limitations and how do they evolve with time? I mean we have 93 percent now for Bruce B. How was it 10 years ago and how will it be in five years or...?

MR. LAFRENIÈRE: Ken Lafrenière for the record.

So the question is how does the power evolve with time?

Essentially, the reactors are licensed for 100 percent full power. One hundred percent full power is a number that represents the thermal output of the core.

As time passes, various components in the reactor age and become gummed up. So, for instance, steam

generator fouling would limit the capacity of the heat transport system to remove that full 100-percent power.

So therefore, at Bruce Power, specifically for Bruce B, over time you get inefficiencies in various systems that limit your ability to withdraw the heat from the heat transport system.

Specifically, at Bruce B they also have an issue with an accident analysis, so the 93 percent full power actually represents the original licensing limits of the reactor that have been reduced because of the so-called large LOCA issue associated with that reactor.

MEMBER HARVEY: But this 93 percent is for now, but that could change with time I suppose. You are talking of aging, so --

MR. LAFRENIÈRE: So you are correct. With time if they don't, for instance, clean the steam generators they could also have to take penalties because of the inefficiency of the system.

The 93 percent full power limit, though, is a safety analysis limit for thermal to make sure the system can meet the licensing limits at the original licensing time and that is more of a step change that was taken due to that analysis. So what -- I guess the message I'm trying to say is there are a lot of competing factors that would reduce the net electrical output of a CANDU

station, some being safety analysis driven, others being efficiency driven, which you can recover if you clean components. For instance, if they go through an outage and decide to clean the boilers they will be able to recapture that margin; in other words, the systems become more efficient.

MEMBER HARVEY: And this is the same process for all the reactors?

MR. LAFRENIÈRE: That is correct, yes, it is the same process.

MEMBER HARVEY: At the moment there is no limitation for Bruce A; is that right?

MR. LAFRENIÈRE: Bruce A limitations are actually --

MEMBER HARVEY: It's for other things.

MR. LAFRENIÈRE: The Bruce A limitations are actually the opposite. The reactor is more efficient than the secondary side so they have limitations on -- for instance, their main transformer cannot handle the power output from the station. The generators cannot handle the power from the turbines which have been improved. So you will see the Bruce A operating at lower power levels, in the 88 percent range, simply because they are more efficient than the Bruce B reactors.

MEMBER HARVEY: Okay, I understand.

Merci.

THE PRESIDENT: Okay, I am a bit confused. I thought that the 92 or the 93 was nothing to do with safety. It had to do with the way the thing was designed to provide steam heat at one time and therefore the 93 is fully operational, fully safe, fully functional, no safety issue. That's the limit. It's 93. It's not 100. Am I missing something?

MR. LAFRENIÈRE: Ken Lafrenière, for the record.

No, you're not missing anything, Mr. President. The steam limitation applies to the Bruce A reactors, which were originally designed to provide steam to the main steam plant and therefore the output of the Bruce A reactors is essentially designed for 10 percent steam output, 90 percent electrical output.

At the Bruce B reactors there are no safety concerns. The outputs are within the original licensing envelope. The point that I was making is that there are several drivers of why those limits, percentage limits are different than 100 percent, but there is no safety issue. So 100 percent --

THE PRESIDENT: About in Bruce B, Bruce B is not designed to -- was not designed also to provide steam --

MR. LAFRENIÈRE: No, Bruce B --

THE PRESIDENT: -- thermal --

MR. LAFRENIÈRE: No, Bruce B --

THE PRESIDENT: -- bbecause they are running at full power. I thought that 93 is full power for Bruce B.

MR. LAFRENIÈRE: You are correct, 93 percent is full power for Bruce B. It's just -- it's just not the original numbers that were used in the design, the original operation of the facility.

So as the reactor ages they have had to take compensatory measures, reduce percentage of power to maintain the same thermal -- the same limits, the design limits in the safety analysis. Is that --

THE PRESIDENT: Ms Velshi...?

MEMBER VELSHI: So I am still a little confused by this. Darlington at full power is at 100 percent, correct?

So when was the last time the Bruce B units were at 100 percent?

MR. LAFRENIÈRE: Ken Lafrenière, for the record.

The last times the Bruce units were at 100 percent was in the mid-'90s. So during that time they had this discovery of the large LOCA issue. So at that time

the licensees took some compensatory measures to make sure they are within the licensing envelope. So the licensing envelope that was originally approved by the Commission is now reflected in this 93 percent. That's a better way of saying it perhaps.

So that the original limits that translate into percentage output of a reactor are reflected as 93, as opposed to 100. Darlington has not had that reflection or that change in their output.

MEMBER VELSHI: Thank you.

MEMBER HARVEY: That's okay. I suppose that this 93 percent will be evaluated in coming years and might decrease if something happens or if they don't complain.

MR. LAFRENIÈRE: So let me be clear that these are electrical output numbers. Ken Lafrenière, for the record.

The Commission licenses the reactors on thermal outputs. Unfortunately, we measure electrical output which has to do with the efficiency of the machines. So the thermal outputs are within the same licensing limits originally given by the Commission to Bruce Power.

THE PRESIDENT: Okay. Monsieur Tolgyesi...?

MEMBRE TOLGYESI : Merci, Monsieur le

Président.

You were talking that Unit 4 was manually shut down because of repair to the demineralized water tank leak and it was manually shut down. It was proactive. If it's a leak, if there is a hole somewhere, it is something which is inspected, it is foreseen or it could be forecast or detected?

MR. HOWDEN: Barclay Howden speaking.

I will ask OPG to respond. I think the leak is from a gasket and so I think our OPG rep can describe the process for where the leak came from and what is their maintenance and inspection to try to detect these in advance

MR. GREGORIS: Yes, Steve Gregoris here.

So for the record the leak was from the flanged base of a valve on the reserve cooling water system. The flange is a bolted flange with a gasket. A leak had developed on that flanged connection and was being monitored and that leak worsened to the point where we proactively shutdown the unit to effect repairs.

The specific flange is on a preventative maintenance program. The inspection is every 15 years and when I will say is the analysis of what happened and the adequacy of our PM program specific to this one joint is being looked at by engineering right now through a formal

analysis in our corrective action program.

I will say that when the repairs were made there was no indication of any defects or abnormalities on the surface so it looked like, you know, initially that the gasket had failed. That does give us concern because this joint is a static joint. It doesn't have movement and it sees relatively low pressures, around 700 KPA and 60 degrees C temperature.

So I need engineering to look through that -- you know, the failure, analyse it and as part of that they will do an extended condition to understand if there are additional actions beyond this one joint.

MEMBER TOLGYESI: I have this worker who suffered a broken arm. Was it Darlington? Is he a Darlington employee or a contractor?

MR. GREGORIS: Again Steve Gregoris.

For the record, this was a contractor from E.S. Fox that was working through the projects and modifications organization, which is part of the Ontario Power Generation.

MEMBER TOLGYESI: And when contractors are working on the site, what is the involvement of Darlington supervision? Are you present? Do you inspect periodically how the work is done?

MR. GREGORIS: Again, Steve Gregoris for

the record.

So this is an owner/constructor project and with that we, through our Projects and Modifications Group have contract management oversight. And so OPG provides oversight to the work and we also of course expect the contractor to provide their oversight for the work.

MEMBER TOLGYESI: You said it was his right arm, there is no cast, it is between shoulder and elbow and he is on light duty. What can he do on light duty as a task?

MR. GREGORIS: Again, Steve Gregoris for the record.

So right now light duties would include being a spotter. That's one of the main duties that this individual would perform, which is basically ensuring clearances for movement of material for that worker.

MEMBER TOLGYESI: Okay. Merci.

THE PRESIDENT: Anybody else? Any other questions? I still would like to come back to the water leak.

And staff, it would be useful just to describe -- I have two comments.

First of all, shutting down the machine proactively means that somebody was really worried, even though it says there is no cooling issue. I don't know,

some bells and whistles would have gone so it would be interesting for you to describe where this leak happened and what is the purpose of this demineralized water and how does that fit into the whole -- just a little bit more information as to describe this.

But if it wasn't a safety issue, why did the operator feel that he needed to shut it down? Somebody please explain this to me.

MR. HOWDEN: Barclay Howden speaking. So I think from a -- so we have been very clear it's not a safety issue. It's an operations issue. However, it was leaking from a system that's being used within the plant.

From our view you have two choices. You let it continue to leak until you are forced into a shutdown, in which case the timing may not be good, or you can proactively look at it and take the planned shutdown. So in this case OPG was proactive to take the planned shutdown, probably with a lot of operational considerations being taken into place.

In terms of where and how the system is being used, I would like to -- I think OPG can answer that question more clearly.

MR. GREGORIS: Steve Gregoris here, for the record.

So the recirculating cooling water system

is a demineralized water system. It provides cooling to reactor side loads and systems that need cooling. The system supplies a couple of key components. It supplies cooling to the main circulating pumps for the heat transport system, the glands for those pumps. It also provides cooling for the bleed cooler. And those are two obviously key components that are required for full power operation and with regards to the bleed cooler for operation at temperature and pressure in the heat transport system.

The leak occurred downstream of the bleed cooler on an isolating valve, at the flange joint for that valve, and with the size of the leak the operational decision, as previously described, was to proactively shutdown the reactor because there would be no way to isolate and repair online. And so, you know, we wanted to ensure that we didn't in any way challenge cooling to either the main circulating pump for the transport system or the bleed cooler and we wanted to get to a state where we could effect repairs. So the decision was made proactively to shutdown the unit and cool it down and then isolate and repair.

THE PRESIDENT: So my final question on this, when you do your root cause, do you also assess whether -- I assume that this valve and the gasket and

everything are qualified material. Do you assess to make sure that the equipment was qualified?

MR. GREGORIS: So Steve Gregoris here, for the record.

So the material was qualified. We will, as part of the assessment, confirm material and look at other things such as preventative maintenance program and previous installation records and any time that flanged joint was worked on to gather all pertinent information to understand the failure.

THE PRESIDENT: Okay, thank you.

Monsieur Harvey...?

MEMBRE HARVEY : Merci.

I just wanted to come back to my first question just to test my comprehension is appropriate. That is a suggestion for the next presentation instead, for Bruce B for example.

To say that Bruce B is at full power and explain underneath that the full power for Bruce Power is such and such because Bruce B cannot operate more than that, so it is at full power. I don't know if anyone can --

MR. LAFRENIÈRE: Ken Lafrenière, for the record.

No, we struggle with this because we are

giving a percentage because the full power is a relative number and a percentage of full power is relative. For Bruce B, again, the licensing limits, the bundle powers, the channel powers, the overall thermal powers of the core and megawatts thermal wouldn't really mean anything to the Commission or to the public.

So I think we will go back and look at it and just put it down in a note so it doesn't confuse --

MEMBER HARVEY: Well, I just wanted to reverse it, to say that they are operating at full power, but full power for this installation.

MR. LAFRENIÈRE: Yes. Yeah. We --

MEMBER HARVEY: Well --

MR. LAFRENIÈRE: Thank you for the feedback, I think it applies. We thank you with the same question. Thank you.

MEMBER HARVEY: Merci.

MR. LAFRENIÈRE: Merci.

THE PRESIDENT: Anything else?

Okay, thank you. Thank you very much.

By the way, I should have said, I think it's one of the shortest event-free reports which to me means that it could be interpreted as a better safety report card in a long time. Thank you for that.

--- Pause

THE PRESIDENT: I'm told that there are no event initial reports listed on the agenda. However, I understand the CNSC staff intends to provide a verbal presentation regarding a recent report about an event at Cameco Corporation's Key Lake Mill.

I understand that we have a representative from Cameco online. Let's test the system here. Mr. Mooney, can you hear us?

MR. MOONEY: It's Liam Mooney for the record.

And yes, I can hear you, and I am joined here by Brett Moldovan, the GM of the Key Lake operation; by Kevin Himbeault, the Superintendent of Safety -- sorry, the Manager of Regulatory Affairs and SHEQ and the Director of Compliance and Licensing, Kevin Nagy, along with our Program Manager of Radiation Protection, Kari Toews.

THE PRESIDENT: Okay. I understand Dr. Newland will make the presentation.

DR. NEWLAND: Yes, thank you. For the record, my name is Dr. David Newland and I am the Acting Director General of the Directorate of Nuclear Cycle and Facilities Regulation.

With me today, on my left is Mr. Jean LeClair, Director of the Uranium Mines and Mills Division. That's the division that leads the regulatory oversight of

this particular facility for this verbal event report. We also have Cameco staff online to respond to any questions that you may have.

The timing of the event and the timing of the availability of key information was such that we did not provide a written EIR at this time. However, we do want to provide Commission Members with a verbal statement since this is reportable involving exposure of workers to uranium oxide. In preparing the verbal statement we realized that in order to help have you visualize what actually happened, we needed to provide a few graphics and so this is sort of like an informal presentation -- not -- we didn't put it on the record and I'm sorry if that has caused a bit of confusion.

So we could come back with a formal CMD and presentation in the future should you so wish.

The event occurred on January 14, 2015 at Cameco's Key Lake Mill. This facility processes uranium ore from the McArthur River Uranium Mine and we have a short presentation describing the event. So with that introduction, Mr. Jean LeClair will now briefly describe the event, actions taken by Cameco, actions taken by staff and future steps forward.

Thank you.

M. LeCLAIR : Bonjour, Monsieur le

Président et Membres de la Commission. Mon nom est Jean LeClair. Je suis directeur des Mines et Usines de concentration d'uranium.

So this afternoon I would like to briefly go over this recent event that occurred on January 14th. But before talking about the event, just to provide a bit of background or remind Commission Members, the Key Lake Mill is actually located in northern Saskatchewan where all the currently operating uranium mines and mills are located. It currently possesses a licence that was issued in October 2013 that expires at the end of October 2023. As Mr. Newland already mentioned, the mill processes uranium ore from McArthur River Mine to produce calcine yellowcake. So there are no mining operations at Key Lake. It's the mill only that's operating.

At the Key Lake Mill as part of the milling process there is a Calciner, which is a furnace that is used to dry and calcine the yellowcake that is produced in the milling process and this calciner is actually currently being replaced. There is a new calciner that is under construction that is quite a bit of a different design than the current calciner, so the event that I will be describing today is not something that we would expect could happen with the new calciner, but Cameco is online and certainly can describe that further if you

are interested to know more about the new calciner.

So the way the calciner or the current calciner operates, there is actually a heated air that comes from a shaft in the middle of the calciner that is actually used to dry ammonium sulphate, which is a by-product in the milling process. As we previously noted, this event occurred on January 14th, 2015.

So if we look very quickly at this diagram, it is a simple diagram to describe the operation of the calciner and the ammonium sulphate dryer. So the way the calciner operates is the wet yellowcake enters at the top of the calciner. There is a shaft in the middle of the calciner with arms. They are called rabble arms that rotate and move the yellowcake through the calciner and the calciner of course heats up the yellowcake and it raises it up to fairly high temperatures, around 850 degrees Celsius to calcine the yellowcake.

The calcine product that is blackish in colour comes out at the bottom of the calciner. So it comes in as a wet yellowcake, which is where it gets the name yellowcake, and at the bottom it comes out as calcined yellowcake, which is actually more of a blackish colour.

So with that shaft that is in the middle of the calciner that's rotating, part of the process has cooling air running up the middle of the shaft to cool that

shaft and the shaft is actually isolated from the calcine yellowcake so that the air is actually clean. It goes up through the middle of the shaft and then that heat that now is in the -- the warm air is actually used to dry the ammonium sulphate in a dryer.

So in this particular event what happened as a result of wear at the base of the shaft, at the seal that you see on the bottom of this figure, a hole actually developed in the shaft itself, which then allowed calcine yellowcake to enter into the shaft and the air that now was moving through the shaft carried some of that calcine yellowcake into the area of the ammonium sulphate dryer.

The ammonium sulphate dryer is an area that is generally clean. The presence of radiological contamination is very low, but in this particular circumstance because the air now has calcine yellowcake in it, it entered into the dryer and some of that calcine yellowcake also went into the work area.

This is a closed building, just to provide context, so the yellowcake was seen on the floor and on the process equipment and could be seen on the ammonium sulphate product itself. The ammonium sulphate product is a bright white and the calcine yellowcake, as I mentioned previously, is almost black, so it was quite visible.

So here in this picture you can actually

see a picture of the hole in the bottom of the shaft. Important to note that you would not have been able to see this because it was within the seal around the shaft, so it's only on removing the seal material around the base of the shaft that you could see the actual hole in the pipe. So it's not something that could have been discovered through visual observation alone.

So with regards to particularly the event itself, when Cameco discovered through routine inspections the presence of the calcine yellowcake that was confirmed through the Radiation Department, workers were safely removed from the area. This is an area that workers don't wear respirators because it is not expected. You are not expected to have yellowcake in the area.

The mill, the entire mill was safely shut down and we were notified of the event well within the 24 hours that is required by CNSC requirements. They then undertook enhanced bioassay sampling to verify for potentially affected workers. There were 13 workers that had worked in the area during that time period who were identified as potentially being exposed to the calcine yellowcake. So we are looking at an inhalation hazardous, is what we are looking at here.

The hole was subsequently repaired and the area of the contamination was decontaminated. The event

information was posted on the Cameco website in accordance with our proactive disclosure requirements and we then subsequently posted a notification event on our website with a link to the Cameco website as well.

Cameco submitted a start-up plan that included enhanced monitoring to us prior to restarting the mill operation and on January 22nd, 2015 the mill safely resumed full operation.

So since this event is particularly associated with potential for radiological exposure as a result of the uptake from the yellowcake -- again to remind the Commission, the regulatory limit is 50 mSv per year -- we require licensees to have a Radiation Protection Code of Practice that includes administrative and action levels. Where an action level is exceeded it becomes a reportable event and it also sets out requirements for the licensee to take corrective actions to re-establish proper conditions. So the licensees -- Cameco's weekly action level is actually 1 mSv.

In this particular case of the 13 workers that may have been exposed as a result of this enhanced monitoring, it was verified that five of the workers were at or above the action level. The highest exposure of one worker was 1.8 mSv as a result of this event.

So there are no exceedances of the

regulatory limits. We don't expect, based on these numbers and based on operational results from the past that the quarterly action levels will be exceeded, and these workers can resume their normal work activities. There is no requirement for any specific restrictions for workers.

With regard to CNSC staff, I noted some of the things throughout the presentation, but we conducted -- we actually had an inspection that was already planned for the week of January 19th to the 22nd. So as a result of the event we actually continued on with that inspection but changed it, included some verification observations of the actual area that had been contaminated, interviews of employees and some verification of the records.

One correction I would like to make to the presentation here is the inspection actually was completed on the 21st of January and not the 22nd as shown on the slide.

Based on that review, the CNSC inspector was satisfied that the immediate response and actions taken by Cameco were in compliance with the programs and the programs that we had verified as part of licensing. We have reviewed the initial reports and part of, again, the Project Officer, part of his inspection was to request a copy of the start-up plan and this enhanced monitoring plan prior to restart of the mill and we reviewed that and we

were satisfied immediately with what they were proposing.

As you can see, with the event occurring on January 14th, where really it is three weeks since the event, we have a number of reports that we are still reviewing. We may have some further questions of Cameco once we have had an opportunity to look at those further.

At this time if we –- the way I saw it is, if we had any significant findings as a result of our more detailed review, we would come back to the Commission. Otherwise, I believe Mr. Newland had mentioned we can come back with EIR and a CMD. The alternative is we could come back with a final results.

We will be coming back to the Commission this year with our CNSC staff annual performance report for the Uranium Mines and Mills where we can provide further details on this event, if that meets with the Commission's requirements.

That ends my presentation. I will pass it over back to Mr. Newland.

DR. NEWLAND: Thank you, Mr. LeClair.

That completes our presentation and staff is available for questions. Thank you.

THE PRESIDENT: Okay. Let's start the questions with Monsieur Harvey.

MEMBRE HARVEY : Merci, Monsieur le

Président.

You mentioned that you found a hole and what surprises me is -- could you be more explicit about the event? If there is a hole like this, was the event a slow leak event? I mean you mentioned that it was black so it was visible. So how did that happen? It's a sudden cloud fog in the building and things like that or the hole could have been, well, evolved with time, like with corrosion and there could have been pollution without being so visible in the building before?

MR. LeCLAIR: Jean LeClair, for the record.

I would recommend perhaps Cameco might be in a better position to elaborate a bit further on the event, provide more details on the event itself.

THE PRESIDENT: Okay. Cameco...?

MR. MOONEY: Good afternoon, it's Liam Mooney for the record.

I'm going to ask Brett Moldovan as General Manager of the Key Lake Facility to give some background on the monitoring and sampling that's taken of the ammonium sulphate crystals to provide the confidence about the time interval that we are talking about.

MR. MOLDOVAN: Thank you, Liam.

Good afternoon. For the record, Brett

Moldovan.

I guess what I would like to start with this afternoon is just a brief overview of the monitoring and operator care rounds that exist at the Key Lake operation. From a monitoring perspective, samples of the ammonium sulphate crystals are collected on a six-hour routine and at 6:47 on January 14th, the day of the event, a routine sample of ammonium sulphate crystals were collected. The samples came back at around 9:00 a.m. that morning, results back to the operations team. The results of the crystals came back at 20 parts per million, which is right within the normal operating range, so 20 parts per million of uranium in the ammonium sulphate crystals.

Carrying on with the chronological series of events, at around 10:15 the operator began to experience what he identified as some operational difficulties in the crystallization circuit and began to troubleshoot. He went out and did a flush of the system, an inspection, and at around 10:30 the operator had identified through his normal operator rounds that the crystallization circuit appeared to be normal and no discolouration of crystals in the fluid bed dryer was noted.

And then at 12 o'clock the operator continued to do another care around and that is when the off-coloured crystals within the dryer were notified or

noticed. The operator immediately notified his foreman and around 12:10 the foreman arrived and continued to investigate. That is when they observed the black calcine on the floor around the dryer and at that point the mill general foreman, along with our radiation department were contacted.

The radiation department showed up immediately thereafter, collected a swipe sample of the area of the observed dust, and by 13:10 we had identified that that material was in fact calcine material, and by 1315 we had all workers removed from the area.

The access to the area was restricted and designated as a respirator use only to enter that area. So the question was, you know, was this leak occurring for several hours, several days or several weeks before we identified the issue and the answer would have to be know, based on our routine monitoring of the circuit and a routine monitoring of these ammonium sulphate crystals. We are quite confident that the incident probably occurred right around that 10:15 in the morning and by 1315 we had the area completely shut down from workers and the area access restricted.

So it was -- it was a very prompt response by our operations and radiation team that prevented this incident from being any worse than it actually was.

Thank you.

MEMBER HARVEY: Thank you. What is the size of the hole and do you have any idea of the cause of such a hole?

MR. MOLDOVAN: Just so I understand the question, the first question was the size of the hole and the second question, if you can repeat that, please?

MEMBER HARVEY: Well, the first question you are right and the second one was how that hole could have been produced. Is it corrosion? Do you have any idea of the problem that caused the hole?

MR. MOLDOVAN: Sure. Sure. So I can answer that. The size of the hole was around 10 cm by about 3 cm. So you can see it's an oval shaped or egg shaped-type hole in the shaft.

And when we looked with our maintenance engineering team, the failure mode was identified as wear on the shaft from calcine material getting into that area. Normally we have a field. That area around the shaft is completely enclosed, keeping it isolated from the process area.

And the challenge is is that that area is very hard to inspect because it is enclosed and what we identified after the failure was that small amounts of calcine were making their way into that centre shaft seal.

It is a sand seal actually and what we saw there was small amounts of calcine getting into that area and the calcine is a fairly gritty material and started to cause the wear on that centre shaft.

So just to further speak to that, the area where the erosion on the shaft occurred is outside of the normal process area. Where the shaft would come in contact with the calcine material we have a refractory encapsulating around -- a refractory material encapsulating around the centre shaft, thereby protecting it from the calcine and the heat within the calciner.

MEMBER HARVEY: You said there was no inspection done in the past on that part of the shaft?

MR. MOLDOVAN: We do inspect that part of the shaft on an annual basis during our annual maintenance shutdown and the last time that the shaft was inspected was May of 2014.

THE PRESIDENT: But when you are talking about an inspection you are talking about visual inspection. Would visual inspection measure thinning of walls and things of that nature? I mean this kind of size of a hole, I just don't see how it can happen that quickly in one year. If you do an annual inspection then you would have detected a very much thinning of walls.

Do I understand this correctly?

MR. MOLDOVAN: I guess -- it's Brett Moldovan for the record.

Do you want to answer?

MR. MOONEY: Yes. It's Liam Mooney, for the record.

I think the visual inspection is part of the controls that are in place. One of the other pieces that Brett touched on was that sampling program in the ammonium sulphate area. So there is the sensitivity around that and there is the sampling program to catch it if it does arise.

So the quick actions of the operator in identifying it and then the team to act upon that instant are a big part of the controls that were in place. I think the other piece that Mr. LeClair alluded to was the efforts underway to replace the current calciner with a different design at the Key Lake operation and have that operational in the nearer term.

THE PRESIDENT: Thank you.

Monsieur Harvey...?

MEMBER HARVEY: Was it the first time you expected such a problem with the shaft or were there other similar events in the past?

MR. MOLDOVAN: Brett Moldovan, for the record.

That calciner has been in operation and maintained since 1983 and this is the first type of event that we have witnessed with the calciner of this magnitude.

MEMBER HARVEY: So you have an idea of the expected life of such equipment? Merci.

MR. MOONEY: It's Liam Mooney, for the record.

Yes, we do. I think the other piece I probably skipped over was that robust preventative maintenance program that the Key Lake operation has in place and that would include during the annual mill shutdown, taking steps to look at the various pieces of equipment. Again to Brett's point that this was an unexpected failure having regard for the previous operation of the facility.

You know, I don't want to leave you with the impression that the calciner wasn't touched since 1983. It was. Work was done on it on a regular basis as far as that annual mill maintenance and scheduled maintenance program.

MEMBER HARVEY: What has been done since to restart the production? Have you changed the shaft or what has been done? What correlated -- what corrections have been made to the shaft to restart the process?

MR. MOONEY: We seem to have lost audio.

Can you hear us still?

MEMBER HARVEY: Yes.

THE PRESIDENT: Yes, we can hear you. Can you hear us? Hello?

--- Technical difficulties / Problèmes techniques

THE PRESIDENT: I guess we got disconnected.

MR. LEBLANC: I will try to establish a new connection.

THE PRESIDENT: A new connection?

MR. LEBLANC: Yes.

THE PRESIDENT: So in the meantime we can actually --

MEMBER HARVEY: Well, I can ask the question to the staff, because they have -- the operation has been resumed since that time and they are now operating. So what has been done? What had been done to the shaft? Did they change it?

MR. LeCLAIR: This is Jean LeClair, for the record.

So what they did is they did a welding of a series of pipes around the shaft to repair it. They did not replace the shaft. They used piping around the base of the shaft to then close it off and seal it off and weld it on to the shaft.

One thing I should mention on the new calciner that hasn't been mentioned is the commissioning of that calciner's plan for this fall. It's not something that gets commissioned overnight. It will take some time for them to get to full operation and with our communications with Cameco the expectation is that in 2016 the new calciner will be fully operating. It is a horizontal electric calciner so it doesn't have this rotating shaft. It doesn't have the same kind of operation and there isn't this recycling of heated air to dry the ammonium sulphate, which is why we don't anticipate or expect having these similar issues.

One other comment if I could, Mr. Harvey, is with regards to the replacement of the calciner.

We certainly recognize and are anxious for them to replace it because the calciner -- there were incidents with -- because it's getting old things wear down and things do need to be repaired and when they do repair it operators have to go into the calciner. It is a respirator area and we generally prefer to reduce the amount of maintenance that needs to be done on these equipment to avoid potential uptake of contamination. So the calciner is up for replacement and we certainly are anxious for them to get it up and running.

MEMBER HARVEY: Will you request a root

cause analysis on that to know how that a hole did develop? Because to have such a hole it could have been there for a longer time than has been mentioned.

MR. LeCLAIR: Yes. Jean LeClair, for the record.

So as I mentioned before, we have the reports. We will further the review. And certainly that is an important part of that review, is the extent of the root cause analysis and whether it is sufficiently robust.

MEMBER HARVEY: And you are confident that --

THE PRESIDENT: Hello. Are you with us, Cameco?

MR. MOONEY: Yes. We were back and then it clicked again and we thought we had dropped off. But we are online right now, Mr. President.

THE PRESIDENT: Okay, great. So we are now in the process of staff explaining to us the process on getting the new equipment.

Go ahead, Mr. LeClair.

MR. LeCLAIR: So perhaps just to help Cameco along, because I'm not sure what part they got or they didn't get, I believe Mr. Harvey asked two questions. One actually was specifics with regards to how it was actually repaired, what repairs were done to the shaft.

Monsieur Harvey also asked about the root cause analysis on the even. And, finally, the last part is, I had mentioned your plans to replace the existing calciner with a new calciner and I believe Dr. Binder was asking what your plans are and when you expect to have the new calciner up and running.

MR. MOONEY: It's Liam Mooney for the record, and I am going to ask Brett Moldovan to answer the questions on the repair, the specifics of the repair and to the plan to replace the new calciner.

On the investigation we did conduct an initial investigation into the event which drove the repair that Brett will describe to you. We followed our corrective action process and the corrective actions that were entered into our Cameco incident reporting system and we implemented the corrective actions prior to the safe restart of the facility.

In addition to that, there are some enhanced monitoring that Brett outlaid -- laid out for you in the previous answer and also the enhanced bioassay program that was put in place in relation to the workers who were identified as being in the area at the time of the incident.

MR. MOLDOVAN: Okay. Thank you, Liam.

For the record, Brett Moldovan.

So I will speak first of all to the repair plan and then a follow-up with the schedule for replacement of the existing calciner with the new one.

So first of all, the hole itself was repaired by welding a 16-inch diameter stainless steel pipe around the shaft, sealing the upper and lower sections with weld repairs. Following the welding repairs, our maintenance team conducted a final smoke test by putting smoke through the centre shaft to confirm that there were no leaks detected in the repair area.

In addition to that, repairs to the sand seals and the lute seals were completed to ensure that the shaft does in fact remain isolated from the calciner process.

Following the repairs the area with cleaned up, contamination swipe and air sampling was completed to confirm the condition of the area. So even in advance of doing the repairs we safely shut down the Key Lake Uranium Mill, we developed a safe repair plan, conducted the repairs and then we had a safe start-up plan that was reviewed by the CNSC prior to starting up. In regards to the new calciner, construction activities continue as of today.

We anticipate final construction to be in and around June or July of this year with

commissioning happening shortly thereafter.

We anticipate, if all goes well, that commissioning will take three to four months. And then we hope to be fully online at that point.

We do plan to have a 2014 shutdown in the mill happening in May of this year. And our intention at that time is to do our normal routine maintenance on the existing calciner so that we have that as a mainline backup should commissioning not go as well as we anticipate.

THE PRESIDENT: Thank you.

Monsieur Harvey? Fini?

Monsieur Tolgyesi?

MEMBER TOLGYESI: Merci, Monsieur le Président.

You were saying that the preventative maintenance on this is done on an annual basis, last time May 2014.

Now, when you do inspection you do that -- because the hole is quite big, 10 cm by 3 cm. As Mr. President said, it is not in last hour it has happened.

That means, do you do the inspection with seal removed or seal in space. Because if seal is in the place you cannot see the hole.

MR. MOONEY: So I will ask Brett Moldovan.

But before we get to that, I think it is important to come back to that question that has arisen a couple of times. And that is when this hole appeared.

And again, there is regular monitoring every six hours of the product that is on that fluid bed dryer that this waste heat is circulated through. And there is a range over the course of the years that the facility has been operated, and it was within that normal range.

So the bump that we saw, irrespective of the size of the hole, only occurred on January 14th. And the upset condition, as best we can tell, started post-10:30. So that fits with the dose modelling that has been done, but it also fits with the analysis of the product in question over the period of time.

So we are quite confident that the issue that lead to the current appearance was brief in time and likely less than three hours in entirety.

MR. MOLDOVAN: Sure. So Brett Moldovan, for the record. I will carryon with some of the comments that Liam had noted.

Just to come back to the timeline, first of all, at 6:47 that morning we did collect a sample. As I mentioned earlier, the results came back at 20 ppm.

When we collected the sample following the identification of the discolouration of the crystals, just from a quantitative perspective, the results that came back at around 1:00 p.m. that afternoon, the results of the ammonium sulphate crystals, the uranium concentration was considerably elevated and the results came back at 247 ppm.

In the 20 years that I have worked at Key Lake and the 30 years plus of operational experience, we have never seen uranium concentrations like that or observed uranium concentrations that high in the ammonium sulphate crystals.

So that suggests, and further confirms, that that hole developed relatively quickly and the upset condition happened quickly and was identified in a quick manner as well.

THE PRESIDENT: I don't think we are questioning the detection. I think what the question is, do you have age-management process? Maybe you should talk to our NPP friends. Your machine ran for 30 years with no incident. That would have worried

me, that when is something likely to happen?

And I think Mr. Tolgyesi is asking what kind of inspection do you do to verify whether this particular pipe, I assume it is a steep pipe, is now thinning and going past its effectiveness date?

MR. MOONEY: Liam Mooney, for the record.

We do have a robust preventative maintenance program at the Key Lake operation. The replacement of the calciner is one of the outcomes of the analysis of the different pieces of equipment and the revitalization of that facility. So I think the overarching piece would be the plan to pull in the new calciner.

But in the interim, the inspections that were taking place previously on an annual basis during the annual mill shutdown, they've been challenged by this event, and we look for some opportunities in the 2015 shutdown to do something better, albeit recognizing that new calciner is scheduled to be coming online.

THE PRESIDENT: Okay, thank you.

Mr. Tolgyesi?

MEMBER TOLGYESI: Because what I understand, that there is no connection between the

calciner as such, whereas the process is happening in a seal space.

Now, because your yellowcake was going through this hole to the air, that means that if it is no connection between those two, it is how it get into. And what is the pressure or suction, I suppose pressure, in the shaft-cooling air?

Because that means it develops a suction, which is bringing the yellowcake powder, dry powder, up to the ammonium sulphate dryer.

So if it was only a hole in the shaft which is closed or, I don't say airtight because it was not airtight because we lost the yellowcake -- but normally that means that the seal also, it is not just the hole, the seal also veered down totally because that gives you that opportunity for yellowcake powder to get into the cooling gear shaft.

MR. LeCLAIR: I think Cameco will be able to speak to it better. But you are correct, in that the seal itself is a sand seal, and part of that seal of course would had to have freed up to make the space for the yellowcake to then come through the hole and into the air.

But perhaps Cameco can better describe the seal itself, the design of that seal, to perhaps

better answer your question.

MR. MOONEY: Sure. Liam Mooney, for the record again.

I will ask Kevin Himbeault to provide you some further details on the relationship between the seal and the incident.

MR. HIMBEAULT: All right thanks, Liam. Kevin Himbeault, for the record.

Certainly in order for the calcine material to get in contact with the rotating shaft it needs to get by a seal. And what we found is there is a metal plate that blocks over a metal seal that is in front of this rotating shaft. And it is those two things that keep the calcine from getting in contact and dropping into that space where the sand seal is and coming in contact with the shaft.

So certainly what we had was a failure of that upper seal which allowed calcine material to basically make its way into that cavity where the shaft rotates.

As it made its way in there and accumulated in that area, it basically -- the shaft rotates around and the calcine material would grind into that shaft and slow wore and put a wear pattern all the way around that shaft, almost making that

shaft much like an hourglass shape and eventually broke through in that hole material there.

So, you know, how that calcine got down there is through a seal that separates that clean or that non-calcine contained area from the upper component of the calciner where the calcine material resides.

MEMBER TOLGYESI: You know, what you are saying, that the hole was developing really fast, according to you, between 10:30 and 1:00 in the afternoon, which is about 3 hours. That is very fast.

So have you adjusted your inspection frequency now? Because you know that it could develop so fast. So how will you control that you will be on top of that and it will not happen?

MR. MOLDOVAN: Sure. It is Brett Moldovan, for the record.

As we had mentioned earlier, we do an annual inspection of the calciner, and then a routine monitoring within the process is what we rely upon to identify issues within the calciner.

The area, as Mr. LeClair identified, the calciner temperature is 850 degrees Celsius, and that seal that is around that shaft does not enable us to do routine monitoring in that area.

So what we do is we rely on other means to be able to identify issues within that cooling airshaft and that was what we had used to identify the problem that we had at this particular time with the off-spec ammonium sulphate crystals.

MEMBER TOLGYESI: You were saying that the sampling at 6:47, you get back at 9:00 it was 20 ppm, and the next one --

MR. MOLDOVAN: That is correct, yes.

MEMBER TOLGYESI: -- and the next one you measured at 13:10 that it was 247 ppm. That means, you do a sampling every hour or more frequently, because you cannot get to that seal part and detect a hole, which means that you should have another preventative measure which will be probably install a monitor or detector which will detect on a continuous basis what is the yellowcake in the ammonium sulphate dryer outtake of air.

MR. MOONEY: It is Liam Mooney, for the record.

And part of the story on this Mr. LeClair alluded to, and that is that the calcine produce is a very dark black material.

And it is part of the Key Lake practice to have these operator care rounds whereby

the operator, on essentially an hourly basis, takes a turn through the plant, including looking at, in this instance, the fluid bed dryer at 10:15. Noticed a bit of hiccups in relation to the operation of that dryer, started to do some troubleshooting.

Came back again for one of those regular operator care rounds and identified at that point some odour and some discolouration.

So in that context, in addition to the monitoring of the ammonium sulphate crystals, the operator care rounds provided some additional assurances that if there were to be an event such as this can trigger the actions that the Key Lake operation took subsequently to remove people from the building and isolate the cause of the concern.

MEMBER TOLGYESI: My last one is that -- I understand what you are saying, it is a human observation. But if for any reasons the operator cannot go back or it is a perception, for me it could be blacker than for, I don't know, Mr. Harvey. So it is a human perception of probably how much of dark yellowcake was there.

That is why I am talking about probably install a monitor which will, on an continuous basis, detect and it will prevent you.

That is it, Mr. President.

MR. MOONEY: It is Liam Mooney again.

And on that, the ammonium sulphate crystals, Mr. LeClair referenced them as they are essentially snow white. So shades of grey, there are none in the circumstances. That if there is a dusting or any -- the calcine product being black, it is a pretty obvious visual cue if there is an issue.

So the operator, if he saw some discolouration, and by some discolouration I mean taking it off the pretty pure white that the crystals are, then the discretion or the subjectivity that you referenced to is eliminated in those circumstances.

THE PRESIDENT: Okay. Ms Velshi?

MEMBER VELSHI: Thank you, Mr. President.

This is for Cameco. Have you made an estimate of how much volume of this calcine yellowcake may have been released from this hole through the shaft?

MR. MOONEY: Liam Mooney, for the record.

We have not. We have been focused on the enhanced bioassay of the individuals potentially affected and getting an understanding on the dose that

they may have received.

And then the other area of focus in addition to the repair and corrective actions was cleanup and getting the facility cleaned and back to its state before the event occurred.

MEMBER VELSHI: Are you planning on making an estimate?

MR. MOONEY: Liam Mooney, for the record.

We can. We were really focused, again, on the radiation and sorting that out as well as making sure that the area was safe to restart the plant in a safe manner.

MEMBER VELSHI: My next question is around the in-service date of the new calciner. And if all goes well, likely before year end. Have you looked at opportunities of expediting that in-service date? Is that even possible?

MR. MOLDOVAN: For the record, Brett Moldovan.

We are working 24 hours a day, around the clock, with a full service crew of contractors at site. We are very excited to have a new calciner at Cameco as well.

And our major projects group is

working very diligently, as I mentioned around the clock, to make sure that the project is delivered in a safe and reliable manner.

MEMBER VELSHI: So is the answer to that the current schedule is the best possible schedule then?

MR. MOLDOVAN: For the record, Brett Moldovan.

That is correct.

MEMBER VELSHI: Thank you.

Are there any other facilities that use a similar calciner who need to be notified of this event? And, if so, have they been? This is for staff.

MR. LeCLAIR: We have Rabbit Lake, McClean Lake and Key Lake that are all producing yellowcake. McClean Lake is a calcine yellowcake mill. They are aware of the incident. Cameco and AREVA do communicate quite regularly.

One of the follow-ups for us in fact was -- as I mentioned, the event is three weeks old -- one of the follow-ups was in fact to meet with the licensees as part of lessons learned.

We even look at the response itself from the event. And we will have communications with

the other sites as well even in that regard. So it is not only the event itself, but the response to the event and the entire process around it will be followed up with the other licensees.

MEMBER VELSHI: But do the other licensees need to take any immediate action or have they had to do any inspections or anything of that kind?

MR. LeCLAIR: We have not, at this time, required the other licensees to take any immediate verification activities. But I certainly will follow-up with them after the meeting.

MEMBER VELSHI: And my next set of questions is really around public disclosure. The first I heard of this incident is when they got this slide deck. And I went on both the CNSC website and the Cameco website to see what was available on this incident.

And clearly, I wasn't looking at the right place because the CNSC website, when I looked under latest news, it wasn't on that. And when I looked on the Cameco website on the Key Lake page I couldn't find it there either.

So you don't have to tell me now, but I would appreciate if you can let the Secretariat know

where that information is, more for future, that I am looking at the right place for incidents like this.

MR. LeCLAIR: Jean LeClair, for the record.

I definitely will provide the links to both, the CNSC website portion as well as the Cameco website portion.

MEMBER VELSHI: Thank you.

THE PRESIDENT: So it is posted?

MR. LeCLAIR: Yes, that is correct. In fact, I verified that yesterday to make absolutely sure, and went and looked at both the links. And this is why it would be very straightforward, because I just looked at it very recently.

MEMBER VELSHI: Yes. It is just not under latest news, so I should be looking elsewhere.

And my last question is for Cameco. How often, or if you were to look at the last year or so, do you exceed your action levels?

MR. MOONEY: Liam Mooney, for the record.

We are quite proud to say that we don't exceed our action levels. Over the past year I don't think we had an exceedance at any of our Northern Saskatchewan operations. And if we did, it

might have been maybe one. So strong radiation performance has sort of been a hallmark of the facilities in Northern Saskatchewan for Cameco facilities for a long period of time.

MEMBER VELSHI: So of these five workers who have exceeded the action level has there been concern and, if so, can you share with us what has been done to allay or address their concerns?

MR. MOONEY: Liam Mooney, for the record.

Maybe I will hand it over to Kevin Himbeault to talk about the efforts that were made with the employees who are on the enhanced monitoring program and the discussions that he had with other stakeholders at the Key Lake operation.

MR. HIMBEAULT: Thanks, Liam. Kevin Himbeault, for the record.

Certainly upon this event occurring we began putting people on to the enhanced bioassay program. And certainly once you do that the questions start to arise.

So certainly initially some concern from some of the workers in the area. We did meet with all the workers involved in this incident, including both Cameco workers and contract workers.

We sat down with the contractors as a group and had a group discussion as well as individual discussions as we started to get some of the results in from the bioassay analysis results.

I think overall there was, you know, certainly initially a little bit of excitement. But as we talked about it, everybody was feeling quite comfortable and we are very appreciative of the dialogue that we did have with them.

We also met with our OHC members that were on site and had a dialogue with them to keep them informed of what was going on. And, you know, many of them were actually involved in the investigation or in the repair planning and the repairs that were made in that area too. So they had a good understanding of what was going on there.

Our general manager sent out a site-wide email to all of our staff informing them of what took place and what actions we were undertaking and that the, you know, appropriate regulators were informed and that we were, you know, diligently working on resolving the issue.

MR. MOONEY: Liam Mooney, for the record.

I would only add at the end that part

of the response that Kevin outlined is a direct by-product of the radiation training that takes place. So the familiarization with the hazards and an understanding of the different protective measures that are in place, and monitoring that takes place to protect worker health in that respect.

MEMBER VELSHI: Thank you.

My last question --

THE PRESIDENT: Before you leave that particular question, I want somebody to tell me -- I know that the dose results are very low. But I thought with this kind of material it is not the dose we are worried about, it is the toxicity.

So somebody, you know, you do the test on inhalation and internal doses. Am I right, first of all, is it the is toxicity is the issue we would worry about? And what was done to measure that?

MR. LeCLAIR: Jean LeClair, for the record.

So, Mr. President, in fact you are correct. Kidney toxicity is the issue that we are looking at as well at uranium. So the uranium in urine analysis was what the bioassy sampling is.

So they actually take urine samples and check for uranium. And because it is in the

urine, of course it means it would have come through the kidneys. So the kidneys is the issue of concern.

Based on the numbers that we see, based on the dose results and the uranium and urine results that we see, we don't envision any issues from a kidney toxicity point of view.

Again though, I don't want to put our specialists on the spot. We just have the results now. We want to look at them more closely, look at the dose results, check the U&U results as well --

THE PRESIDENT: But you have a specialist right behind you. Why don't you hear from the specialist?

MR. LeCLAIR: Certainly, we can. Caroline I am sure would be happy to reply as well.

MS PURVIS: Thanks, Jean. Caroline Purvis, Director of the Radiation Protection Division, for the record.

So certainly the exposure we are talking about here is long-lived radioactive dust. And depending on the physical form and the solubility of that material, there is different critical organs.

So certainly for a fast-clearing type of material, a fast-clearing yellowcake, which his a non-calcine type product, then the critical organ of

concern is the kidneys. And in those cases, the primary concern when you have a large intake is toxicity to the kidneys.

In this particular event the exposure was to calcine long-lived radioactive dust in the form of yellowcake. So in that case it is a much slower-clearing type of material, it resides in the lungs longer. And in this case, there is not as much of a risk of kidney toxicity, it is more of a dose consequence.

That being said, the exposures that are being estimated and reported by Cameco are relatively low. And based on their protocols for an abnormal intake of material, there is no indications that there is any concern from a kidney point of view.

THE PRESIDENT: Ms Velshi?

MEMBER VELSHI: That was my question.

THE PRESIDENT: Anybody else? An other particular question?

So you saw with a keen interest this should definitely be an event reporting. We will obviously look forward to an update at the annual report on uranium mines and mills, particularly as to what has been done, root cause, and all this, and the way ahead.

And to compliment you, I always like diagrams. Thank you for this diagram, it simplifies the understanding of what was going on. So thank you for that.

Okay.

DR. NEWLAND: Noted, thank you.

THE PRESIDENT: Thank you.

Anything else? Are we going to move? Yes, we are going to move to the next item?

Okay, we will take -- we never do a five-minute break, I think 10-minute break is more likely. So we will reconvene at 3:45.

Thank you.

--- Upon recessing at 3:38 p.m. /
Suspension à 15 h 38
--- Upon resuming at 3:51 p.m. /
Reprise à 15 h 51

CMD 15-M4

CNSC's Early Role in an Initiative for a Deep Geological Repository for the Long-Term Management of Canada's Used Nuclear Fuel

THE PRESIDENT: We're back and the next

item on the agenda is a presentation by CNSC staff on CNSC's Early Role in an Initiative for a Deep Geological Repository for the Long-Term Management of Canada's Used Nuclear Fuel, as outlined in CMD 15-M4.

Dr. Newland, I think you still have the floor.

DR. NEWLAND: I do indeed. Thank you.

Good afternoon, Mr. President, Members of the Commission. My name is Dr. David Newland and I am the acting Director General of the Directorate of Nuclear Cycle and Facilities Regulation.

With me today are:

- Ms Karine Glenn, Director, Wastes and Decommissioning Division;

- Ms Julie Mecke, Senior Project Officer in the Wastes and Decommissioning Division;

- Dr. Julie Brown, Geoscience Specialist in the Environmental Risk Assessment Division;

- as well as other support staff.

CNSC staff are here to today to provide information to Commission Members on the CNSC's early role in an initiative for a deep geological repository for used nuclear fuel, specifically focusing on how we are explaining our regulatory role to communities who are in the learn more process and on how CNSC staff collaborate

internationally.

I will now turn the presentation over to Ms Mecke, who will deliver the first part of the presentation, and then Dr. Brown will deliver the second part and then we'll wrap up for questions.

Thank you.

MS MECKE: Good afternoon. My name is Julie Mecke. I'm a Senior Project Officer on the Wastes and Decommissioning Division.

CNSC's staff presentation will cover the following.

First, I'll provide some background information on the Nuclear Waste Management Organization, or NWMO.

Second, I'll provide some information on the status of NWMO's initiative for a deep geological repository, or DGR, for Canada's used nuclear fuel which the NWMO has called the Adaptive Phased Management approach, or APM.

Next, I'll explain CNSC staff's early involvement in the NWMO's APM initiative and I'll focus on our pre-licensing activities, specifically CNSC outreach activities with communities.

I'll talk about the CNSC/NWMO Service Agreement and CNSC's Independent advisory group. Then I'll

provide examples of CNSC Open Houses that we have conducted when requested by communities.

And finally, Dr. Brown will talk about how we collaborate internationally on DGRs and then I'll finish explaining the next steps.

The NWMO is a not-for-profit corporation established under the *Nuclear Fuel Waste Act* by Canada's current nuclear energy corporations, the three nuclear power reactor corporations who are Ontario Power Generation, Hydro-Québec and New Brunswick Power Corporation, and Canadian Nuclear Laboratories which was formerly AECL.

The NWMO is not a federal agency or Crown corporation.

The NWMO is responsible for implementing the Adaptive Phased Management approach accepted by the Government of Canada for the long-term management of Canada's used nuclear fuel. It is responsible for all used nuclear fuel in Canada.

To be clear, if an application were submitted to the CNSC in the future, the NWMO would be the licence applicant.

To be clear, at this time no site has been chosen.

However, this slide shows NWMO's

conceptual, not final, design for a deep geological repository for used nuclear fuel.

NWMO's most recent concept is that a DGR would be located at a depth of approximately 500 metres within bedrock. The host rock type has not yet been decided but will be located in either crystalline or sedimentary rock.

On the right-hand side, the conceptual illustration shows the surface facilities as (1), the shafts as (2), and the layout of the galleries underground as (3).

The centre illustration shows the potential orientations of the waste canisters in a hypothetical repository, so either vertically, horizontally or surrounded by bentonite clay as a sealing material.

And finally, the left-hand side shows a possible design of the used nuclear fuel canister, where the fuel bundles are encased in copper canisters with a steel liner.

Next, I'll provide a status update on the NWMO's APM initiative.

The NWMO states that the APM specifies that:

- Used nuclear fuel will be placed in a centralized repository, underground in a rock formation

that provides the required containment and isolation.

- Public engagement will occur at all stages, and the host community for the repository would be an informed and willing one.

- Furthermore, the NWMO has stated that this is a $16-to-$24-billion national infrastructure project.

While the NWMO has not established a fixed timetable for implementing the APM, the funding formula for contributions has been developed and that assumes a geological repository would be in operation by 2035.

In May 2010, the NWMO launched a 9-step site selection process to look for volunteer communities to host the repository. The Appendix of this presentation includes details of the NWMO's 9 steps.

In September 2012, the NWMO indicated that no more communities will be accepted into their learn more process.

The NWMO started with 22 communities; currently, as of January 22nd, 2015, 11 communities remain in the process.

This is NWMO's map showing the location of the communities involved in the process. There were initially 22 communities and as of January 22nd, 2015, there are now 11 communities, one in Saskatchewan and 10 in

Ontario.

The blue circles are communities that are still in the NWMO's learn more process and the light grey circles are communities that were originally in the NWMO's learn more process but have not been identified for further study by the NWMO.

As mentioned, there are 9 steps in the NWMO's site selection process. This slide will focus on steps 2, 3 and 4.

The first box is Step 2, which is an initial screening. At this stage the NWMO carries out a high-level screening with existing information.

The second box is Step 3, which is a preliminary assessment, and currently all 11 communities are in Step 3 of the process.

Step 3 has two sub-steps and I've called them Phase 1 and Phase 2.

In Phase 1, desktop feasibility studies are conducted and engagement activities are conducted by the NWMO. At this stage, Community Liaison Committees, or CLCs, are formed. And I will explain more about CNSC's outreach activities to the CLCs later in this presentation.

In Phase 2, this is where initial field work and broadened community engagement activities are carried out by the NWMO. Field work may consist of aerial

geophysical surveys and geological mapping. Depending on the results, deep boreholes may be drilled at selected sites. Currently, no boreholes have been drilled at any sites. They're still at the initial phases of Step 3, Phase 2.

Step 3 activities are designed to assess the potential suitability of communities to host a DGR for used nuclear fuel and possibly at the end identify one or two preferred sites for which they would move on to Step 4, which is detailed site characterization.

To be clear, no site has been identified to proceed to Step 4.

Now, I will discuss the role of the CNSC.

While no CNSC licence is being sought by the NWMO at this time, the early involvement of the CNSC in the NWMO's APM activities is important because:

- It helps to ensure that there is no misunderstanding of the NWMO's plans by the regulator, and vice versa. It also allows CNSC to engage early on with the public on our regulatory process and our regulatory role.

- In addition, international best practice supports the involvement of the regulator early in the process of siting a deep geological repository.

Therefore, CNSC staff's objectives for

this period are to:

- first, build our own independent knowledge;

- start a dialogue with a future applicant;

- communicate the CNSC's roles and responsibilities, and I'll explain how we are doing this with communities, specifically the CLCs;

- provide clear regulatory expectations, especially on key safety aspects;

- maximize national and international collaboration, and my colleague Dr. Brown will discuss this further; and

- review key research publications from proponents.

The CNSC's early involvement with the NWMO is formalized in a service agreement. This service agreement between the CNSC and NWMO is good until the end of March 2019 or until a licence application has been submitted, if one is. It identifies areas of CNSC possible involvement in the pre-licensing period prior to the submission of a licence application. The service agreement is posted on CNSC's website.

The areas of CNSC's involvement include:

- participating at public meetings to

explain our regulatory role;

- reviewing NWMO materials with respect to CNSC's regulatory role; and

- conducting pre-licensing reviews of the conceptual design and post-closure safety assessment for two hypothetical cases. One case is in a crystalline rock formation and the other case is in a sedimentary rock formation. Since no site has been selected, the review will be conducted at a fairly high level.

The CNSC recently signed a contribution agreement with Carleton University to fund an independent advisory group, or IAG. The IAG will provide independent geoscientific advice to CNSC staff as we prepare for the possible future licence application from the NWMO. The IAG will do this by reviewing key NWMO technical documents as well as the CNSC's own internal research program.

This approach is similar to that of the Finnish regulator, STUK, and the Swedish regulator, SSM.

Dr. Brown will discuss CNSC's meetings and visits with other regulators later in the presentation.

The CNSC's independent advisory group is comprised of Canadian experts in the geosciences who are independent from the NWMO. Members are geoscientists from Carleton University, Queen's University, McMaster University, the University of Manitoba and the Geological

Survey of Canada. Current membership is for a 3-year period and may be renewed.

In the future, the IAG may be requested to focus on one or more specific topics or to evaluate areas of investigation that may be included in an actual safety case and/or supporting safety assessment.

CNSC staff expect the group to continue until a licence application is submitted if the NWMO submits one in the future.

Next, I'll focus on CNSC pre-licensing outreach activities.

At this early stage before a licence application has been submitted, the CNSC staff outreach activities serve to explain our regulatory role as the independent watchdog. We also try to start to build our own relationships with communities.

CNSC is currently conducting outreach activities at the request of communities or CLCs in the NWMO's learn more process and we've also recently been expanding to Aboriginal groups.

CNSC meets with Communities or CLCs who have expressed interest in learning more about CNSC's regulatory role. The format and sequencing can be as follows:

- First typically is a day-long meeting in

Ottawa with representatives from the communities. Typically, this includes the mayor and council members. However, CLCs have also come to Ottawa to meet with CNSC staff.

- Second, CNSC staff have been invited into the community to present at community liaison meetings. This is an initial meet-and-greet with CLC members and CNSC staff make the offer to come back into the community if they wish to conduct further outreach activities. We also emphasize that there is no rush to meet with us. It's at the discretion of the CLC on whether they think the community is interested in learning more about our regulatory role at the appropriate time. For example, on two occasions, CNSC has been invited back by CLCs to give a similar presentation as there were new members or the CLCs thought that there was interest from the public in the community to hear about the regulator.

- Furthermore, at the request of CLCs, CNSC staff have held open houses in those communities.

- CNSC staff have also met with Aboriginal groups.

The CNSC can repeat the above-mentioned activities as there may be new people on the CLC or more interest from the community to hear from the regulator. In addition, there may be interest from regional groups or

Aboriginal groups.

Therefore, additional CNSC outreach activities are planned as the APM process unfolds.

CNSC staff have conducted over 35 outreach activities since May 2010.

This map displays two things:

– One, the status of each of the communities in the APM process. Again, as a reminder, the blue circles are the communities who are still in the NWMO's learn more process.

- Two, it outlines CNSC's outreach activities and these are shown by the purple-coloured squares.

The lightest purple-coloured square depicts the first step where it's typically the mayor and council travel to Ottawa, so before CLCs are formed, for a day-long meeting with CNSC staff. CNSC staff have conducted 18 sessions. And again, some of them have occurred twice. For example, in Ignace we had one in May 2010 and another in November 2011 due to council member changes.

The medium purple square. As follow-up to the initial meeting or at the request of the CLC, CNSC staff have been invited into the communities to give a presentation to the communities' CLCs. Members of the

public are often present at these meetings. CNSC has conducted 14 of these activities.

The dark purple squares show where the CNSC has been requested to conduct open houses. To date, five open houses have been carried out in the communities of Ignace, Ear Falls, Hornepayne, Huron-Kinloss, Elliot Lake and Spanish, and all of those are located in Ontario. CNSC anticipates future open houses in the spring of 2015, starting with Blind River, Ontario.

In addition, there have been recent requests from Aboriginal groups to meet with CNSC staff -- these are not shown on the map -- and CNSC anticipates requests from Aboriginal groups and regional communities in the next year. In addition, CNSC have combined outreach activities with existing facilities as sometimes there is overlap. For example, CNSC staff have met with Mississauga First Nation to talk about how we regulate the Blind River facility. However, the next meeting will focus on CNSC's early role in the APM initiative.

These are CNSC's key messages when conducting outreach:

- CNSC is an independent regulator.

- No licence application, and it is early in the process.

- We are clear that we do not promote the

APM program or nuclear energy.

- We do not create energy policy.

- CNSC's role is to ensure safety.

Messages emphasize who the CNSC is and our regulatory role. This was one of the key messages that was stressed as important to communicate to the public when we spoke with regulators in Sweden and Finland in June 2013, ensure that the roles are clear between the regulator and the implementer or the future licence applicant.

Now, I'm going to focus on CNSC open houses.

Open houses held at the request of the CLC typically as a follow-up to the day-long meeting in Ottawa or a CLC meeting.

First, CNSC starts by developing a logistics plan.

Second, we have at least one teleconference with the CLC Chair and their Project Administrator or Project Coordinator.

- The CLCs have been an excellent resource for CNSC staff. For example, they provide information on where to hold the open house, where to put public notices, they actually help with posting public notices in the community, they help us with who to invite and help with shipping and logistics.

- Based on the feedback from the CLC, CNSC typically holds one open house session in the afternoon and one in the evening. We have also held an open house on the weekend last summer at the request of the CLC so that cottagers could attend this open house.

The third step is public notices. We also obtain help from the CLC on how best to notify the public, for example, what radio station they suggest using, newspaper, even local advertisement bags and advising on the mail drop. At the open houses, staff have received good feedback from attendees on the public notices. So far, I think the mail drop has been the most successful. Even if people do not attend the open house, they have received our invitation through the mail.

The photos on the right-hand side are examples of CNSC Public Notices. The first photo is an example of a mail drop invitation and, in the foreground, is an example of a CLC, including the notice in their newsletter of CNSC's upcoming open house.

In addition, CNSC also sends invitations to the mayor and the mayors of surrounding communities and also Aboriginal groups in the area.

Again, the CLCs, we work with them to help indicate which surrounding communities they have

been communicating with and if they have been communicating with any Aboriginal groups as well.

So the following slides illustrate some of the outreach tools that CNSC staff use at open houses.

So first, CNSC staff have created eight panels of who the CNSC is, our early role in this initiative, how we regulate, how we inspect to ensure nuclear facilities are safe. We have a panel on Aboriginal consultation, transportation of used fuel and international collaboration and the photo at the top corner is an example.

One of the information panels actually explains the Commission. Members of the public often ask questions about the Commission and its independency and to help the CLCs learn more about the Commission, CNSC staff have notified the CLCs of this meeting presentation this afternoon so they can get further information about the Commission.

The second tool is the one-on-one discussions that members of the public have with CNSC staff and we found this to be the best outreach tool. For example, members of the public get to talk to an actual inspector, specialists in geology, environment and international relations.

This one-on-one format allows people to ask questions and also to voice their concerns. Staff can provide factual information or, if we don't know the answer, or if the question's beyond our mandate, we can help them to find the information.

There's also notification of CNSC open houses on CNSC Facebook account. We've also found it useful to have web accessibility so that we can show people our website or where to find information on our website.

We've also helped people subscribe to CNSC's e-mail notification. We've also used the CNSC online, but we found that members of the public were hesitant to touch the screen, so we typically have a staff member sit down with them and help them go through the online program.

And finally, at the bottom, we have CNSC hand-outs. We put a bunch of information on USB sticks. We also have our annual reports, fact sheets, FAQs on transportation, fact sheets on regulating repositories, so a lot of information if they want to know more about us.

So the following slides are examples of CNSC open houses.

These slides include a photo from

CNSC's two open houses in Ear Falls, Ontario which was held in April, 2013. An open house was held in the afternoon and as part of the evening open house, the Ear Falls' CLC specifically requested a presentation from CNSC staff. So a 10 to 15-minute presentation at the start of the open house in the evening and then the rest of the open house followed.

This is an example of CNSC holding two open houses, again, in April, 2013 in Ignace, Ontario and this is a photo of CNSC staff having one-on-one discussions with members of the public. And we also offer to walk members of the public through the eight panel that we have, or they can also explore the panels on their own. However, typically members like CNSC staff to walk them through the panels, just explain them a bit further and they may have follow-up questions as we go through.

This photo is from CNSC open house in Elliot Lake on October 18th, 2014. Again, CNSC held two open houses; one in the afternoon and one in the evening. And this is just a photo of the outreach team. This was a larger community, so more staff were brought in to help with the open house and to help answer questions.

Also, the Elliot Lake CLC specifically

requested kind of a hands-on demonstration of what radiation is and how to detect it, so we brought a radiation protection specialist with us to provide that demonstration to members of the public.

And this photo is from two open houses in Spanish, Ontario in November and, again, this is a photo of members of the public exploring the panels up there, a local marina where we held the open house and our CNSC geologist discussing geology maps of the region.

And at the last open house that we held in Elliot Lake, so before this open house, the public was very interested in the maps of the area and the geology, so we decided to bring them with us to the next open house to show them.

So the following is just a snapshot of topics of questions. Members of the public at each of the open houses have asked us excellent questions and staff have had many in-depth discussions.

And please note, this is not an exhaustive list, but in general, just explaining the CNSC: who we are; how we ensure safety; our licensing process; so our life cycle from siting to closure, to operation, decommissioning, abandonment; the frequency of inspections. They were also curious about -- that

we can actually do unannounced inspections, that was of curiosity to them, and the independency of the Commission.

And general questions on repository safety. So what if something goes wrong? Could it affect my drinking water? What if there was an accident, if there was an earthquake? Basically, how will safety be ensured?

We've received questions on CNSC independent research and what's going on internationally and Dr. Brown will talk about that on upcoming slides.

Transportation comes up too, transportation of used nuclear fuel, sometimes emergency preparedness and the packaging of the used nuclear fuel.

Clarity on roles, basically clarifying that we are not the NWMO and we cannot answer questions on the site selection process, we are not here to promote and we do not choose the site, we're here basically to ensure safety.

So the following are examples of what we've learned from talking to communities and starting since May, 2010, so we have almost five years of experience.

Overall feedback has been very positive. People are happy to hear that someone is looking after safety and that we are here for a long time. So they may not realize that we are here for the life cycle of the nuclear facility and, if a licence is issued, that there are safety checks and rules that need to be followed.

It's been good to explain who we are and our early involvement. Some members of the public didn't know that there was an independent nuclear regulator, so this is new information for some of them.

Again I mention this, the importance of clarifying roles, you know, who's the regulator, who's the implementer, the future licence applicant.

Explaining our independence from the APM initiative. This also reinforces the importance of conducting our outreach activities separately from the NWMO and this was also emphasized by the Swedish regulator as something to do.

To be clear, we're not here to promote the project, but to ensure safety if an application were to be received in the future.

Again, to understand general concerns of the public and to establish a relationship with

people in these communities.

The communities like that they can meet subject matter experts; for example, inspectors on how they conduct compliance, enforcement measures and that we can have one-on-one discussions.

And taking in what we've learned so far, again, the importance of establishing a single point of contact so people know who to contact and have a face to put with it. This was also feedback we received from the Swedish regulator, SSM.

Seek feedback from the community liaison committees or the CLCs. This is kind of a new resource for us in the communities, so it's been a good resource to get information from and to get feedback from.

And again, we've established a communication assessment plan, and this is a living document and we are trying to be proactive and update as the project moves forward and we will re-visit ideas for future outreach with communities and CLCs this winter and also get feedback from them on what they want to hear from us as well.

So to assist the public, CNSC have included information on talking to communities on our external website. The site will be updated as the APM

initiative proceeds. CNSC are currently developing new content. The updated text will inform those interested about the CNSC role and our licensing process for a deep geological repository if we receive an application in the future.

Now I will turn the presentation over to Dr. Brown.

DR. BROWN: Thank you, Ms Mecke.

CNSC staff participate in several international projects and right now several other countries, particularly in the European Union, are ahead of us in terms of repositories.

So in terms of repository projects, we can learn from their experience and, in turn, they are interested to learn about the CNSC and how we regulate, how we carry out research and how we carry out our technical reviews.

Where possible, CNSC staff collaborate on research projects and a key point is that not every country researches everything, so these collaborations are one way to share knowledge and to pool resources on a global scale.

This slide highlights the diversity of CNSC's international collaborations.

CNSC is actively involved in several

groups in the International Atomic Energy Agency, IAEA, which in general have a regulatory focus.

The Waste Safety Standards Committee looks at what guidance documents are needed for radioactive waste and deep geological repository projects.

The International Project on Demonstrating the Safety of Geological Disposal, GEOSAF, aims to harmonize approaches for the development of the safety case.

HIDRA looks at human intrusion in the context of radioactive waste disposal, the focus is on clarifying IAEA requirements and guidance relevant to the assessment of future human actions and human intrusion.

The underground research facilities network is very important for us in Canada as there is currently no underground research laboratory or URL in Canada. So that program provides an overview of experimental programs at URLs that are in that network.

CNSC is also involved in two Nuclear Energy Agency committees which include industry participants.

CNSC staff have met with regulators

from other countries to talk about pre-licensing activities that they undertook and lessons they learned and also to visit underground research laboratories and other facilities.

Staff also actively participate in the Joint Convention on the Safety of Spent Fuel Management and on the Safety of Radioactive Waste Management.

This slide provides examples of international projects that CNSC staff are involved in.

I will speak first to what's called the SEALEX project.

So the CNSC collaborates with the IRSN, which is the French Institut de Radioprotection et de Surete Nucleaire, through a MOU to exchange information and to collaborate on technical, scientific and regulatory matters. And as part of this collaboration, the CNSC participates in this SEALEX project that is performed by the IRSN at their underground research laboratory in Tournemire.

The SEALEX project is an experimental program that investigates the long-term performance of bentonite seals. The top right photo shows the experimental set-up where bentonite is placed into

boreholes that have been drilled into the host rock. The hydraulic and mechanical evolution of the bentonite will be monitored for a period of approximately 10 years.

The CNSC contributes financially to the project for its experimental work, but also mathematically models the experimental data that is gathered from the SEALEX experiment.

So the project of the SEALEX modelling work that is done by the CNSC is periodically presented in a forum called DECOVALEX. So DECOVALEX is an internationally collaborative project to develop models to interpret experimental data from underground research laboratories from around the world and also from laboratory experiments.

Within DECOVALEX, CNSC also models a heating experiment that is called HE-E that is being carried out at Mont Terri which is Switzerland's underground research laboratory. It was set up to investigate the effect of heat generation from used nuclear fuel on the host rock and engineered barriers.

The set-up of the heating experiment is shown in the lower photo on the right-hand side and consists of two heaters inserted into bentonite blocks that are then emplaced into a tunnel that was

excavated into the host rock. The response of both the bentonite and the surrounding host rock to heating up to a temperature of 140 degrees is monitored.

So this slide is about SITEX. SITEX is the Sustainable Network for Independent Technical Expertise of Radioactive Waste Disposal. It was a European Commission project proposed and coordinated by the IRSN.

It began on January 1st of 2012 and it ran for two years. It consisted of 10 European Commission countries and Canada represented through the CNSC and it was a collaboration to address safety issues around the long-term management of used nuclear fuel, looking at what regulatory expectations should be, what are the main technical issues for safety, and how a technical review of a safety case should proceed.

A follow-up project has been proposed and, if accepted, would begin in May of 2015 and Canada's involvement would continue through the CNSC.

Contacts made through CNSC's international network made it possible for a small group of CNSC staff to meet with regulators from Finland and Sweden and to visit underground research laboratories and near surface disposal facilities in

those countries in June, 2013.

These types of activities are excellent for training. And we've also found that for outreach it's been extremely useful to tell members of the public that we work with other regulators around the world and visit facilities that are further along in the process from us of establishing a deep geological repository.

The next several slides will show photos of the facilities that we visited in Sweden and in Finland.

So this photo is of a CNSC staff member walking down the ramp at Sweden's underground research lab, called Aspo, which is used only for research purposes. It's located in a different area than the proposed location of the final repository for Sweden's used nuclear fuel.

In their outreach material the Aspo URL is referred to as a dress rehearsal, so it's where field tests are carried out and technical solutions to potential problems are investigated at the proposed host rock depth of around 500 metres.

So this is a photo from Sweden of a shallow repository that was excavated in bedrock to a depth of around 50 metres. In Sweden and Finland

shallow repositories are used for short-lived low and intermediate level radioactive waste from reactors from nuclear power plants.

This photo shows the rock vault that's used for low-level waste which, in this case, has been encased in concrete.

So a small correction for this slide, that it isn't staff photos, but it is from Sweden's waste management organization, SKB.

This is a photo from one of the two near surface repositories for low-level and short-lived intermediate level reactor wastes in Finland. So this site is excavated to a depth of around 60 metres and the photo shows one of the silos.

So this is a photo of ONKALO which is Finland's underground research laboratory for used nuclear fuel. In contrast to Sweden, it is also the site of the final repository but it's currently only used for research and characterization purposes.

The photo shows CNSC staff and representatives from nuclear power plant facilities, so waste producers, and from Finland's waste management organization called Posiva. The group is standing in a demonstration tunnel at a depth of around 420 metres, which I will point out in the

schematic of ONKALO on the next slide.

So this illustration shows the design of the ONKALO facility which is Finland's underground research laboratory where we participated on an inspection with the regulator. So far, it's used only for research and rock characterization and stores no used nuclear fuel.

You can see that the access tunnel is extended to the left and this was done to avoid a fracture zone which they didn't observe from the surface.

So the illustration shows the more than four kilometres of ramp that has been excavated to a depth of around 500 metres. And the characterization and demonstration tunnels are at a depth of around 420 metres and the next slide shows some photos from that level.

So these photos from ONKALO were taken while on a site visit with the regulator in Finland.

The left photo shows the group walking down the ramp and was taken at around 4,200 metres along the ramp at the demonstration level. So the fluorescent markings on the left that arc upward show the location of a planned demonstration tunnel that hasn't yet been excavated.

And on the right, you see the group is standing in a demonstration tunnel that has been excavated.

Now, both of these photos show cylindrical pilot disposal cells that were excavated vertically downward into the host rock for characterization purposes.

So the right photo shows a fracture going through one of the cells. It is actually a water conducting fracture and so that cell would not be used for disposal.

In summary, for the most part, this visit reinforced that CNSC's work in the pre-licensing stage is on par with what is being done internationally.

We were able to discuss activities that they carried out at the pre-licensing stage and what they wish they had done sooner. It reinforced for us the importance of our own pre-licensing activities such as outreach and the establishment of an independent advisory group.

Furthermore, both regulators emphasized the importance of having clear guidance and an ongoing review process in the pre-licensing phase.

It was advised that informal meetings

between CNSC and NWMO specialists should occur more frequently and that CNSC should consider carrying out informal inspections.

One of the things that CNSC staff are now planning for 2015 is a management system assessment of the NWMO's contractor procurement process.

In return, CNSC provided our hosts in Sweden and Finland with information on Canada's regulatory process and safety-focussed repository research program.

I will now hand the presentation back to Ms. Mecke.

MS MECKE: So in summary, CNSC's participation in the pre-licensing phase over the next several years will involve CNSC staff continuing to make presentations during this period on CNSC's roles and the requirements for long-term management of used nuclear fuel to various communities and Aboriginal groups participating in the NWMO's siting processes and may also include different provinces.

- Informing the NWMO of our regulatory requirements during conceptual reviews and during review of any future site evaluations that may be completed for interested communities.

- CNSC to conduct informal audit of NWMO's quality or management system of contractor procurement as this is something tangible that we can actually review, it's not conceptual, there's real information there.

- In the future, observe NWMO's outreach activity; basically how information is being communicated to the public as this we see as a large section of possible future licence application will be the public information program.

- CNSC's staff have been conducting independent research since 1978 starting the focus on crystalline.

- CNSC staff again will continue to have international collaboration and if the Commission is interested in learning more about CNSC's independent research program for our deep geological repositories, CNSC staff are able to return to give a briefing.

- The Contribution Agreement has been signed and the kickoff meeting will be in March 2015.

- CNSC staff are also working on the regulatory framework which will involve deep geological repositories for used nuclear fuel, for example, on the development of discussion paper that may lead to the development of radioactive waste and decommissioning

regulations, and again also looking at our existing and possible future regulatory guides.

Our community outreach is expected to expand to regional, aboriginal and even possible transportation hubs as this initiative progresses.

I will now turn it back to Dr. Newland.

DR. NEWLAND: Thank you. That includes staff's presentation, we are available for any questions that you may have. Thank you.

THE PRESIDENT: Thank you. There is a lot of material in here. I have long been waiting for this presentation so I am sure there are going to be lots of questions.

Let me start with Monsieur Tolgyesi.

MEMBRE TOLGYESI : Merci, Monsieur le Président.

To begin with, on your slide 9 you are talking about steps, Step 2, 3, 4. In the initial screening there was taking a few months. That initial selection, was it based on geology? That means that I know the geology is probably suitable for this kind of facilities, then I will look if communities there are interested. Or you go to the other side. We say who is interested? And they are -- or maybe they were 22 and then after we will go back and say, okay, you are interested but

your geology is not good, yours is potentially good, et cetera?

So how was it selected?

DR. NEWLAND: Ms Mecke will provide an answer.

MS MECKE: So just as a reminder, this is NWMO's process, so I will try my best to explain it.

So initially what NWMO has tried to do is to first look for a willing and informed host community, so my understanding from the initial 22 communities as they came forward

The other part that NWMO was also looking for is a willing and informed community, but also a suitable geological rock formation as well.

MEMBER TOLGYESI: Because it could, you know, there could be lots of communities or several communities interested, but not necessarily suitable and what has happened if eventually the interested communities are –- they don't have a suitable geology you should just disregard them, I expect.

DR. NEWLAND: Dave Newland, for the record.

If you refer to Appendix A right at the back of the presentation, it sets out the nine steps that the NWMO goes through in its process. And it is at the

beginning very broad engagement with any communities that might be considered. And as it goes through that process -- and part of it is building awareness amongst the communities -- and it is then later on that it then starts to look at other factors such as geology.

MEMBER TOLGYESI: If I am going to the last page, you know, there are nine steps, we are right now in Step number 3, Phase 2. So when you are looking at Steps 5, 6 and 7 involving many legal activities because we are negotiating and selecting, et cetera, so when will the detailed planning of a site will take place?

Because first we should have an interested community. Second, you know, we should have the geology. It takes some time.

And after when is the planning taking place? Because I don't see that in the Steps 5, 6 or 7.

And then 8 is a construction and operation of an underground demonstration facility. So maybe the planning or engineering and site planning is somewhere during the steps. I don't know, maybe 4, 5, 6, somewhere there, but it's unclear where it is.

And it could take place, because you don't know –- first, you don't know where you go. Second, you don't know what is the geology. And only when you know the geology you could say that, okay, what are the facilities?

What facility should we develop, et cetera?

MS MECKE: Julie Mecke, for the record.

So maybe I will start back again. NWMO site selection process, they are in charge of selecting the site. But basically it's kind of like a triaging of communities, so in the initial screening -- and I will ask Dr. Brown to step in after, but there's an initial screening just looking at the existing kind of geology of the area and if they see any red flags they kind of, you know, stop the clock.

The NWMO may invite communities with higher potential to go into the next phase and again they would conduct more detailed assessments, and that would include more in-depth looking at the geology of the site, kind of more desk paper review and if that community is still okay, there are no red flags with that and there are no red flags with the other parameters that they are looking at, the NWMO may ask the community if they want to proceed to the next phase.

In the next phase where four of the -- I'm sorry -- the majority of the communities are now, are a more detailed characterization so they are doing more. They have existing data but they have updated it. So they are doing aerial surveys, also walking the land. Dr. Brown can explain that more.

If they kind of pass those stages, there are no red flags technically and the community is still -- they want to proceed forward, the NWMO would then possibly invite them into Step 4, which is the detailed site characterization phase. And in that phase you would get, I think, more of the information that you are looking for, the details of the site.

Also, at the end of Step 3 there may be boreholes. So you get to really know the geology of the area, add more information, look for red flags.

And then Step 4, I think NWMO said this would be probably up to five years or something, really doing the detailed site characterization.

Steps 5 and 6, I say, are up to the NWMO and the community because they are the signing of agreements and what not.

And then according to their Step 7 is when they would submit an application to the CNSC, but we would be involved earlier with looking at the results and the site characterization phase.

So I will let Dr. Brown maybe explain how the geology is looked at.

THE PRESIDENT: Who is next?

MS GLENN: Karine Glenn, for the record.

This is just a reminder that the selection

process is actually NWMO's process. It is not the CNSC who will select the site or assess the geology.

Once a selection is made, then that is when the CNSC will come in and step in its role in the assessment of the application. But until that point this is NWMO's process and the focus of this presentation is to discuss CNSC's early role in engaging the potential communities.

DR. BROWN: Julie Brown, for the record.

Just to potentially give you some more information about the geology, it is a core piece of information during the site selection process, so for many of the -- all of those communities that signed up for the NWMO's process, they did learn more about the geology of their community and it started out with just desktop compilation. So using the, in some cases abundant, in some cases less abundant information that is available from industry and also from geological surveys and other publications and they do what's called a desktop compilation and from that they can tell a bit more about the geology. What they are trying to do is see if they can identify a favourable host rock at the proposed step.

So how they refer to it is if a site seems to to have more uncertainty associated with the geology of the site at the proposed repository depth, then it is seen

as having lower potential to be a potential good DGR, so it wouldn't be selected for further study.

So this Step 3 process, they are identifying sites -- you know, there is the social side which is very important, but for safety the technical side is -- the further studies that they are doing now, they are getting airborne geophysical surveys done to get more detail on narrowing down specific sites that they will investigate further. They are going to work on ground truthing the information that they gather from those surveys. So that is where they are at right now and, you know, we monitor those things for sure.

The other thing that the NWMO does that is sort of a parallel track --

THE PRESIDENT: Can I stop you here?

Listen, I don't think we should be discussing NWMO, what they do, what they don't do. That is not the function of what we need to do here.

What we need to do here as a regulator, what are we expecting for the next 20 years? The aim is for 2035, so what is the process for us, the regulator, from here on?

One of the questions will be, when are we asking the NWMO to come in front of us and give us the next status report as to how they are doing and then we can ask

all those questions about where are you in your research, in your planning, et cetera. I don't think this is the purpose of today.

Monsieur Tolgyesi...?

MEMBER TOLGYESI: You know, I didn't necessarily want to go through all these details because by experience I know how the mines are built and how it looks. It takes long.

But my question was that if -- by CNSC is still 2035 potentially feasible? Because on the technical side it is --

THE PRESIDENT: It's not our date.

MEMBER TOLGYESI: Yes.

THE PRESIDENT: It's their date. If they cannot make it they will tell us and they will come with the application. And it's not our concern whether it is feasible or not.

MEMBER TOLGYESI: And then I have one, is we visited Sweden and Finland. In Finland the demonstration facility became a part of the final facility; in Sweden not, it's one side and the final facility is somewhere else.

Is there some reason why it happened? I mean it's technical, yes, but we were there as the CNSC.

MS MECKE: So from what we learned in our

visits to Sweden and Finland -- we understand from the Sweden experience that the community -- there were two kind of communities narrowed down and the one community where it was in kind of the running, I guess, wanted the research laboratory there. And it wasn't known when the final location would be. But, as Dr. Brown explained, you can still use a lot of information, demonstration from that research laboratory and apply it to Forsmark, to that facility.

In Finland, they have decided to go with an underground research lab. Their licence -- both licensing applications for an actual construction of a repository are still under review, but the idea in Finland is to use that underground research lab as part of the final repository. And I don't know if they just decided that simply if we are going to build an underground research lab, we are going to put this ramp in and do all this stuff. We might as well make it part of the final repository.

But then also what we learned from their is that as the regulator, if you are going to put the URL as part of the final repository, then you are probably going to have a lot of oversight. So the regulator there has oversight over the URL there. So they look at the construction of that and also really look at the post

closure.

So you may be just constructing an underground research lab, but if that becomes your ramp for your final repository, you really need to look at the post-closure scenarios too really early at that stage.

MEMBER TOLGYESI: And my last one.

THE PRESIDENT: (Off microphone).

Monsieur Harvey...?

MEMBRE HARVEY : Merci, Monsieur le Président.

First I wanted to thank you for the presentation, which is quite complete. And there are so many answers in your presentation that I had difficulty finding questions. Despite that I have two questions. I will start by the second one, which is sort of a preamble to my first one.

Should I be a participant at one of your open houses or special meetings, my first question would be, what is the Commission's position vis-à-vis the radioactive waste disposal? Does the Commission support a deep repository solution?

MS MECKE: When members of the public ask me that question I say that as the regulator our role is to look after safety. So we kind of are more a non-prescriptive regulator and it's up to the licensee or

the future applicant to propose how it will be safe. So if they want to go with the deep geological repository for the long-term isolation and containment of waste that is their choice and they will have to make the accompanied safety case to back that up with the safety behind it.

On the international front, from the International Atomic Energy Agency, they have in their waste classification system that most countries are going -- with nuclear power plants are going to a deep geological repository for the long-term management of used nuclear fuel.

We are also -- as Julie mentioned, you know, we met with Finland and Sweden. Also, France is going this way. The United Kingdom is also going this way. So we are -- just internationally other countries are going that way.

MEMBER HARVEY: A sub-question would be --it's not my second one or my first one. It's just a sub-question. Do you have any other means to manage the radioactive waste? Is this the only solution that appears currently -- I mean now?

MS MECKE: Julie Mecke, for the record.

In Canada we have an open fuel cycle so that's what we've been going with. I guess the policy is up to the provinces and the nuclear -- the government of --

going back a little bit, under the *Nuclear Fuel Waste Act* which was enacted in 2002 and the Government of Canada enacted the *Act* for the utilities as the responsible owners and responsible for the long-term management of funding of the waste they produce, specifically the used fuel to come up with an organization that is going to implement a long-term management solution to the used nuclear fuel.

The NWMO made four recommendations to the Government of Canada. The Government of Canada chose the adaptive phase management approach, which at the end would result with a deep geological repository for used nuclear fuel.

MEMBER HARVEY: Okay. That's fine.

Now, my first question. During the next 20 years, 20 or 30 years, you already have an agreement with NWMO which will continue, I suppose, during all those years. You have had and you will have meetings with the liaison committee and you will have many other open houses and meetings on demand, et cetera, et cetera. You will have on the website of the Commission information about that process and you will continue to visit the experimental sites all over the world.

So during all those years, but at the end of the day doing all that and doing even some research, inside research and collaborating with other researchers,

at the end of the day how would it be possible for the Commission to claim that the Commission is completely independent of all that? And when will you receive the final solution of the project? You will say, okay, we are completely independent. We will do the environmental assessments and the license without any BA. This is the essence of my question, how?

DR. NEWLAND: Dave Newland, for the record.

MEMBER HARVEY: Well, I'm asking that question like being the public, seeing that and having that kind of collaboration and at the end we say, okay, we will receive the project and you say we are independent and you will repeat that the Commission is independent during 30 years. So what is your answer to that?

DR. NEWLAND: Dave Newland for the record.

So from time to time we enter into pre-licensing agreements with organizations like the NWMO, with designers for example for power reactors, with the purpose of, as Ms Mecke and others have explained, getting up to speed on the technologies, et cetera.

At the first time when an application is made, those agreements get set aside and we then go into the formal process of bringing forth to the Commission all the appropriate information at the time of licensing, at

the time of doing the environmental assessment. Does that answer your question?

THE PRESIDENT: Let me ask --

MEMBER HARVEY: Well, my point is, doing that those -- all those activities, aren't we participating -- is that sort of narrowing the solution, that bringing the people, wringing all the experts towards a specific -- because at the end it becomes with the project which is completely out of the range of our thinking, will we have to start again?

MS MECKE: Well, I guess that goes to -- Julie Mecke, for the record.

I will go back to the key messages that we give in outreach and that we are really clear upfront that we are not here to promote it. We are here to –- and the Commission as well is not here to promote the project. Our role is to ensure safety.

But we have also learned from other regulators as well. In Sweden and Finland, they were about 20 to 30 years before they received a license application as well so their, you know, advice to us was as a regulator make sure your role is clear, that people understand who you are and don't get you confused with the applicant.

But also our role is communicating to the public who we are as the watchdog, but we also have to

guide the future license applicant. As Dr. Newland has explained, that we do this for new power reactors, possible new reactors, but also for deep geological repositories as well. It's important. It's important for us to explain our regulatory expectations.

Also just even for the Commission, just even updating the Commission on what is going on, because it could be, you know, decades before an application is received, so just keeping that going as well.

THE PRESIDENT: So let me piggyback on this. So it's not only the reality, but the perception, you know, that the regulators are working with the NWMO on an ongoing basis for so many years, how could a regulator when the final application comes in say no? Can we still say no?

And that's the message we absolutely have to make sure everybody understands that, yes, we can, and we will. We may all get fired, but we will say no if it doesn't meet our safety criteria.

The other thing is -- and that's a little bit more practical question, you are going to do this outreach over 20 years, the next 20 years if they are going to meet their 2035 target date. Some of the people that you are reaching out now, afraid of touching a computer means to me that they are old. They are not going to be

around when this is going to come in front of us and we are not reaching the young kids who have no problem getting onto a computer and playing with CNSC online.

So really what it tells me is that we have to do some practical issue -- some practical milestones in this voyage to 2035 of getting a lot more public and periodic appearances in front of us. So rather than wait for the last one, this is my question, coming down to a question, should we summon them all to appear in front of us and say, "Tell us why the last five are okay, the last remaining five?" Tell me what -- because when you boil it down to five, then you have done some of the things Mr. Tolgyesi was talking about. You have done the geology. You have done al lot of -- you have the political support. You have all the support. So tell us that we are all onside moving forwards; these five are eligible.

We still haven't seen the safety case on construction and operation and all that, but at least the high-level regulatory requirements are okay. So what is that number? Is it five? Is it two, is it one?

Mr. Jammal wants to jump in.

MR. JAMMAL: It's Ramzi Jammal, for the record. I have to bail out my colleagues here.

Your question is --

THE PRESIDENT: You are not bailing out.

--- Laughter / Rires

MR. JAMMAL: -- is very valid, Mr. President.

In all seriousness, this is the -- to answer Mr. Harvey's question, an informed regulator is engaged with the research element on what is going on. So for us to be an informed regulator, as you mentioned, to establish the high-level requirements -- as we go closer and this is why -- this is one of the first public updates to the Commission that I have asked staff to present to the Commission, for us to show in a public domain what work is being done, because the final point is, as the President says, if the safety case does not meet our requirements we will not be recommending to the Commission to issue that license.

But to get there this is a very long process. And one of the elements in this process, so that the Commission is fully aware of -- as the communities become smaller in number, then my recommendation is to come before the Commission to say, here is the host community. Because the last thing you want us -- not us -- you want the industry to be in, NWMO and in regulatory to be in the bind right down to one site, one community. And then we say no. So now you go back and retract.

So we are informed and we have the

independent advisory committees which are being established through contributions in order to develop the research requirement and advise staff on what needs to be done towards the future. So the key elements here, we are looking at the pre-licensing design, but we have to make the decision so that the Commission is able to determine and for us to give a recommendation on what is the safety case being proposed by the proponent and the applicant. As the President mentioned, the dates and the timelines are the proponent's timelines.

We ensure safety is being maintained, but at the same time we will have to make a decision with respect to what we present to the Commission, two or three potential sites so that we make recommendations based on the best available safety case for the short-term and the long-term.

What I would like to add to your question, Mr. Harvey, is, in addition to the research and the plans of the utilities, Canada is one of the very few countries in the world where the operator is putting out funds with respect to long-term management of the waste. So the impact to the future generation, the new computer generation, or whoever it is going to be, the funds are already accumulated over the years in order to provide a solution, ongoing solution.

So I want to go back to the fact that the funds and the requirements are being put in place. But in specific the funds, there will be no impact on the next generations with respect to the fuel management.

THE PRESIDENT: Ms Velshi...?

MEMBER VELSHI: I want to follow-up on a comment that the President made that when it comes to the target date of 2035, that is really not our date and we don't particularly care. So who really does care that there is a solution by a certain date? Is this something mandated by the federal government? Because the operators don't really care. The more they are delayed the less their financial burden is.

So where does that imperative for having a solution by a certain date really come from?

MS MECKE: Julie Mecke, for the record.

The 2035, just to be clear, that's their date for the funding formula. There is no mandated stage in legislation, like Finland has mandated dates in their legislation.

If I just go back maybe in time, this is kind of Canada's second attempt at finding a deep geological repository for used nuclear fuel. This started in the late '70s and in the '90s there were public hearings and the recommendations from the Seaborne Panel was that,

you know, technically it could be feasible and they were looking at crystalline rock, but the social acceptability wasn't there. They went back to the Government of Canada who enacted the *Nuclear Fuel Waste Act* and my understanding is that there are no dates in that *Act* because it is really -- and what they have learned from other countries is you can't really put a date or you can't really force -- you don't want to force the public into a date, so there are no timelines on the project.

I have asked the question, you know, what if it doesn't work? What if it doesn't move forward? Then I guess they go back to square one again, but this is the process that the Government of Canada has accepted under the *Nuclear Fuel Waste Act* and the NWMO is implementing the process now.

THE PRESIDENT: Sorry, go ahead.

MR. NEWLAND: Dave Newland, for the record.

Just to broaden that question a little bit, I think there is a recognition that the longer that you leave waste as waste and you don't deal with it in a final repository, the price goes up. And that has been recognized in the U.S., the U.K., and European countries. Therefore, I think there is a broad incentive to deal with it as soon as you possibly can, rather than wait.

So it may not be stated as a formal requirement, if you like, but I think there is a broad recognition the sooner you deal with it the better, just in terms of the financial costs.

THE PRESIDENT: Well, let me pose the question slightly different. I think we all do care that we find a solution, including us, and if DGI is not the solution right now the only other solution, you store your -- you maintain it on-site. We have not done -- we are not sure what the safety case -- or on-site storage forever. That is a big debate. In fact, in the States there are some who believe that it is a feasible solution to waste.

But again, it is up to this organization to come to us and say we found a safe solution. We hope they do, but the key from our perspective is the safe. So we do care. I think everybody should care about what is the and result of storage for waste. The question is what is the modality of doing it?

Did I get it right?

DR. NEWLAND: Dave Newland for the record.

Yes. And I think the sooner the better. 2035 is there for planning purposes and it may be 2035, it may be 2040, but -- I will leave it there.

THE PRESIDENT: Ms Velshi...?

MEMBER VELSHI: You have talked a fair bit about research and international collaboration and I suspect that there are regulatory requirements that the NWMO has to undertake research to demonstrate that they are coming up with some solution. I didn't see in your next steps your review of their research activities underway. Is that something you do on an ongoing basis already?

DR. NEWLAND: Dr. Brown, please.

DR. BROWN: Julie Brown, for the record.

So one of the activities of the Independent Advisory Group that has been established, their first activity will be to carry out a review of the NWMO's research program.

MEMBER VELSHI: And I noticed that your Independent Advisory Group, the membership is primarily or almost exclusively geoscientists or people with a geotechnical background. Is that appropriate? Does it need to be broader in expertise?

DR. BROWN: Julie Brown, for the record.

So there are five members of the group right now and they do have actually a variety of background in the geosciences and engineering. So there is a regional geologist who is an expert on the geology of the Canadian Shield for example. There is a hydrogeologist and there is a contaminant transport engineer. There is a geo-mechanics

expert who is an engineer and there is also an isotope geochemist who has experience working with on the Yucca Mountain Project. So there is a variety, but that isn't to say that in the future that we would need different experts, so the demographic of the group might evolve with time.

And also, if we need to at this time access different areas of expertise, we would hold workshops and make sure that that expertise was accessed as needed.

THE PRESIDENT: Just to piggyback on this one, I assume that you are not closing the door for getting -- if Finland and Sweden actually build some of those things, some of those experts from those countries might be a useful addition.

DR. BROWN: Julie Brown, for the record.

Absolutely. We would definitely want to continue those collaborations and, in fact, those are some of those people in that network, the International network. Those are the people that we have as point of contacts that we would reach out to and invite to come and work with members of the IAG.

THE PRESIDENT: Okay, thank you.

Mr. Tolgyesi...?

MEMBER TOLGYESI: You know, you met the

Swedish and the Finnish regulators. You exchanged -- what was their advice to you, what you should -- what are constraints and challenges, where the regulators should pop in, where are the bells, which bells are ringing, you know, what you should watch or what you should push or from where you should stand?

MS MECKE: Okay, I will take the first step.

So one of the things that we learned when we went there, and we were actually in the initial phases of developing an Independent Advisory Group and then we found out that both regulators also have this. So it just gave us more backing that we were on the right track, so that they both have independent advisory groups.

It was also important to -- it's something that we will have to think about in the future but also keep in the back of our mind is the management change when you have kind of an organization doing research right now and then they are going to submit a license application. So that is something for us to keep on our mind as the regulator, but also as a possible future applicant that kind of shifts.

So they also really stressed the importance of really being clear about your role to the public, that you are the regulator and making sure that the

public or communities understand that.

Again, the visits to the underground research laboratories were very crucial for CNSC staff, again, just training, knowledge building, developing networks. Another thing that we learned is more about the research program and we can apply that to our research program, that they did put a lot of funds towards research. Some of them actually contracted out expertise and in hindsight they were like, we wish we developed our own in-house staff to look at that over the long through, over the long time.

From our point of view, what we learned is that as a regulator, like we require a license at siting, which is different from other countries. So we are involved pretty early in the process and we also have, you know, a clear mandate on health and safety during the construction phase.

So we have that expertise and we also have the expertise in that we also regulate operating uranium mines and we have those people who can help us as well. So there was a good feedback to that.

Dr. Brown, did you want to add anything?

DR. BROWN: No, I think you covered it.

MEMBER TOLGYESI: You know, we have a kind of -- you meet the communities. There are lots of native

populations also.

Did the Swedish and Finnish meet these kind of situations and how did they handle that and to what extent did they have the public involvement, the public promotion within the communities?

MS MECKE: Julie Mecke, for the record.

So in both countries the communities actually have a strong kind of power. They have the power to say no to the project. So just we focused a lot on what they kind of did after narrowing down the siting process, but they were really active in just focusing on the community and the surrounding communities as well.

STUK as a regulator is fairly well known in Finland, so they continued that knowledge and continued to talk to communities like we are doing right now. We have learned, but they were further away. Like they would attend, you know, community meetings or their CLC meetings in Canada, so continued to do that.

In Sweden again kind of the same process, really focusing on the community, maybe the surrounding communities. Further on in the process, again having a single point of contact, but really participating there to explain the role of the regulator and the licensing process and if an application were received, you know, what's the process that they could go through.

MEMBER TOLGYESI: My last. You know, in Finland we were saying that there was an experimental facility which will be part of the final. Well it is not the case in Sweden.

How would the population in both cases accept this experimental facility, because it means that it is going forward? You know, it is not only that we are talking about, but it's there.

So while there are some different challenges, when was this experimental facility constructed?

MS MECKE: Julie Mecke, for the record.

I really can't comment on that. I didn't ask them about, you know, did the community support an underground research laboratory. I do know in both Finland and Sweden both of the final proposals are in communities with already nuclear facilities, so people were already, what they said, familiar with that aspect.

And in Sweden where the underground facility is located, and you are right, it is not the final location, again that's in a community that has a nuclear reactor in there. They also have the club facility as well where they store all the used fuel for the reactors in that facility now.

So each of the communities, I guess,

already had a familiarity with the reactors being on-site, so the URL was not that, you know, different to them at all. But I can't comment on, you know, their feelings on the community on when they went ahead.

THE PRESIDENT: Thank you.

Monsieur Harvey...?

MEMBRE HARVEY : Merci. Just one question. On slide 15, which is the one with the map here, when you are talking of communities not identified for further study, is it not yet identified or they have been rejected and they are no more in the process?

MS MECKE: So again, according to NWMO's process, they are no longer in the process. So they have been, I guess, screened out or not asked to advance forward. I think that's how they say it.

MEMBER HARVEY: Thank you.

THE PRESIDENT: Just while we are on slide 15, and I assume we are going to post this -- you are going to post this deck somewhere -- if you are, please change the colour. I know you were trying to be subtle, but the difference between light purple and middle purple and this purple, it's pretty hard on my eyes and I'm still not sure I have it right.

You were going to say...?

DR. NEWLAND: Dave Newland, for the

record.

Yes, we do plan to post.

THE PRESIDENT: Okay.

DR. NEWLAND: And point noted. Thank you.

THE PRESIDENT: Ms Velshi...?

MEMBER VELSHI: What learnings from a regulatory perspective have you had from the DGR for low and intermediate waste licensing process? Is it "oops" or is it premature?

THE PRESIDENT: It's a bit dangerous to get into lessons learned now while the panel is in there.

MEMBER VELSHI: I understand, okay.

DR. NEWLAND: Thank you.

THE PRESIDENT: But if you want to do a general --

MEMBER VELSHI: No, I understand, that's fine. I just wondered if there were any that you had already addressed.

So your primary focus in this phase is really to make sure that the communities understand the role of the regulator and its independence. How are you measuring how successful and effective are you at that?

MS MECKE: I think right now we are at the start. Each of the meetings that we have we do try to take note of the questions. We don't identify anyone, but we do

take note of the questions that have been asked. I think we have about 540 questions right now kind of in a database and we use those to improve our outreach materials over time.

How we get feedback is again just talking to people at the open houses, talking to the CLC project administrator, talking to the CLCs and getting their feedback. Again, it is a work in progress. We will continue to -- you know, we think we know what the public wants to hear from us and at the end they will give us feedback.

And right now we are kind of looking at our communication assessment plan right now and taking in what we have done over the past five years and thinking about ideas on how to move forward.

But also we have these CLCs and also seeking feedback from the CLCs on, you know, what do you want to hear from the regulator? Like some of them for our open houses have said, "Can you come and do a demonstration on radiation protection?" So we can do that. Some of them have asked for a presentation during the open house. So we can do that as well. So it has really been a learning experience with actually each of the CLCs over the process and what has -- you know, their feedback from the community and what they feel that they would like to have a topic

from the CNSC.

But our first step, and I think just based on my experience over the past five years, it has been just to simply establish who we are as the CNSC and once we get that message in play then we can work on, you know, expending our outreach activities, getting feedback and expanding forward.

MEMBER VELSHI: What is the CNSC's budget, both as far as staffing and known labour dollars for this work?

MS MECKE: Just based on the planning that I did, last year I think we are at four fulltime employees. The team right now, it's mainly me fulltime and probably Dr. Brown half the time, but we have a team of about 20 to 30 experts from different disciplines, so about four FTEs total.

The budget, I think I budgeted for outreach activities maybe $75,000. So we do look at that and then Dave, Dr. Newland can talk to the management perspective on how we look at, you know, the funding and staffing as the project unfolds.

MS VELSHI: Yes. No, I was just more interested in getting a sense of the quantum of the level of effort and this is great. Thank you.

THE PRESIDENT: But I'm going to make sure

that there is no budgetary constraint and this is going to be high priority for this and it will increase in intensity as it becomes more and more real in a sense. So I'm not sure we were getting the full capability that you have in house to do the outreach.

MEMBER VELSHI: Well, it's more than outreach, too, I mean if you are doing your own independent research and technical work as well. So that's -- yes.

THE PRESIDENT: So that is the whole shot then, the whole nuclear waste division in there, so it's a lot more than the four FTEs.

DR. NEWLAND: Dave Newland, for the record.

So if you look across our total FTEs within the division, that would be around -- plus including specialist expertise, it would be 20 to 25 across all of the activities.

THE PRESIDENT: Right.

Ms Glenn...?

MS GLENN: This is Karine Glenn, for the record.

I just want to emphasize that actually the activities the CNSC conducts are actually cost recovered so NWMO is actually providing the funding. So whatever the amount of effort that we need to put out is ultimately

funded through cost recovery by NWMO and we plan accordingly on an annual basis in order to provide the outreach necessary for the phase and the demand that we receive and we can readjust as required.

THE PRESIDENT: Okay. Question? Some more questions?

I have a couple of quickies here. First of all, you know in Appendix A, it came before. The word "CNSC" is not mentioned. You know, it is a sore point, particularly when they talk about the regulatory approval and they actually mention the *Act*. Well, who is managing the *Act*? So this is for future reference.

I'm glad to hear that we are thinking about posting the deck, because some of the research activities that are outlined here, it will be really nice if it comes into our website in one place and continuously updated as more and more interesting research and experiences are being shared and posted, because there is a lot of material in there that really does not get in one place, the easy read about what is being done in all of this. So we have to find a way to actually post some of this, share the information.

I have only one question that I really would like somewhere an answer sometime. So what is the period of appearing in front of us on this subject?

When is the next time CNSC should do an update?

When is the next time NWMO should come here?

And when is the next time -- when are you going to start doing the pre-licensing generic studies, the two studies on the two different types of structures?

Does anybody want to give some dates?

MS MECKE: So I will start with the pre-licensing project reviews. We have already started to review those and we are actually -- I'm getting ready to submit the final comments on the sedimentary case study. So we reviewed both -- so those are conceptual design and post closure safety assessments for the two hypothetical sites.

What NWMO is going to do next is, they have dispositioned our comments, but they are going to create two additional studies; again, one on crystalline rock and one on sedimentary rock. And they will update those studies with our comments in them, but they will also update the studies based on, you know, the research that they have been doing since they have originally submitted those reports. They are doing a lot of international collaboration and their own research. So they will update those two reports. So those are kind of an ongoing

technical basis that we are looking at.

In terms of NWMO appearing before you, the last time they appeared was I think in December 2010. Staff have told them, you know, it is probably a good practice to come and talk to people who may be making the future licensing decisions. So it has been suggested on an annual basis that they come to talk to you and I believe that they will be coming to talk to you shortly. I unfortunately cannot give you any dates, but I can -- Dr. Newland can communicate that message to the NWMO.

In terms of staff appearing in front of the Commission again, we did offer if you would like to hear more about our independent research program that we are doing and we are more than happy to come and update you at a frequency that you would like.

THE PRESIDENT: Presumably in the annual report there will be some updates on an annual basis about some interesting new research activities, et cetera.

Mr. Jammal...?

MR. JAMMAL: It's Ramzi Jammal for the record. It's as Ms Mecke has indicated, we will be updating the Commission on a frequent basis.

Definitely the annual report with respect to the Directorate of Nuclear Facility, DNCFR itself, we will be indicating to you as an ongoing basis when we are

going to appear before you in order to provide you with a regulatory update or even provide the Commission and the public a dedicated technical session, as Ms Mecke mentioned, as a result of the research.

So in addition to the posting of the presentation there is going to be more engagement with the Commission and the public as a result of the research from our year two perspective and in the annual report we will be indicating to you on the next steps for us to come before you and provide you an update.

And there is a magnificent amount of information from us able to provide the information from the field itself. Some of the elements that NWMO is using, using those sites that our colleagues visited to perform an actual testing of the shielding, the containers themselves, so we are able to get the proper information. So all this information we will be updating to the Commission as we go along with this project to ensure two things, knowledge management is preserved and transparency with the public.

THE PRESIDENT: Okay, thank you. Anything else?

Okay, thank you. Thank you very much.

DR. NEWLAND: Thank you.

THE PRESIDENT: You wanted to say a final...?

DR. NEWLAND: Thank you.

THE PRESIDENT: This concludes the public meeting of the Commission. I think everybody for their participation.

Marc...?

MR. LEBLANC: Yes. So we will resume tomorrow. We will reconvene tomorrow morning at 9:00 a.m. for the public hearing on Bruce Power's application for the renewal of their operating license.

I don't think anybody in the room has interpretation devices, so I would ask you to please return them to the desk. Bonne fin de journée.

Merci.

--- Whereupon the hearing adjourned at 5:30 p.m.,
to resume on Thursday, February 5, 2015
at 9:00 a.m. / L'audience est ajournée à 17 h 30,
pour reprendre le jeudi 5 février 2015 à 9 h 00