

Canadian Nuclear  
Safety Commission

Commission canadienne de  
sûreté nucléaire

Public meeting

Réunion publique

September 30<sup>th</sup>, 2015

Le 30 septembre 2015

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

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

Commission Members present

Commissaires présents

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

M. Michael Binder  
M. Dan Tolgyesi  
D<sup>r</sup> Sandy McEwan  
M<sup>me</sup> Rumina Velshi  
M. André Harvey

Secretary:

Secrétaire:

Mr. Marc Leblanc

M. Marc Leblanc

General Counsel:

Avocate générale :

Mr. Denis Saumure

M<sup>e</sup> Denis Saumure

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Ottawa, Ontario / Ottawa (Ontario)

--- Upon commencing on Wednesday, September 30, 2015  
at 9:05 a.m. / L'audience débute le mercredi  
30 septembre 2015 à 9 h 05

**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.

We would ask that you 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 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 morning 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 those joining us via videoconferencing and webcast.

I would like to begin by introducing the Members of the Commission.

On my right is Monsieur Dan Tolgyesi; to my left are Dr. Sandy McEwan, Ms Rumina Velshi and Monsieur André Harvey.

We have already heard from our Secretary Marc Leblanc. We also have with us here today Monsieur Denis Saumure, Senior 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 updated agenda published on September 24th for the complete list of items to be presented today as well as tomorrow.

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 all the items before us today.

Mr. President...?

**CMD 15-M38.A**

**Adoption of Agenda**

**THE PRESIDENT:** I would like to now call for the adoption of the agenda by the Commission Members, as outlined in Commission Member Document CMD 15-M38.A.

Do we have concurrence?

**UNIDENTIFIED SPEAKER:** Yes.

**THE PRESIDENT:** For the record, the agenda is adopted.

**CMD 15-M40**

**Approval of Minutes of Commission Meeting held  
August 20, 2015**

**THE PRESIDENT:** I would like now to seek approval of the Minutes of the Commission meeting held on August 20, 2015. The minutes are outlined in CMD 15-M40.

Any comments, additions, omissions?

**UNIDENTIFIED SPEAKER:** No.

**THE PRESIDENT:** Okay. Therefore, I guess -- do we have concurrence?

**UNIDENTIFIED SPEAKER:** Yes.

**THE PRESIDENT:** So for the record, the Minutes are approved.

**CMD 15-M42**

**Status Report on Power Reactors**

**THE PRESIDENT:** So the first item on the agenda for today is the Status Report on Power Reactors, which is under CMD 15-M42.

I understand that there are representatives from industry here. I will recognize them later but first I understand that staff will make a presentation.

Mr. Howden, the floor is yours.

**MR. HOWDEN:** Thank you.

Good morning, Mr. President and Members of the Commission. My name is Barclay Howden, I am the Director General of the Directorate of Power Reactor Regulation.

With me today are our Power Reactor

Program Division Directors plus technical support staff who are available to respond to questions on the Status Report on Power Reactors, which is presented in CMD 15-M42.

**THE PRESIDENT:** I'm sorry to interrupt but I'm told that we have some people online and I always like to test technology.

So do we have NB Power online?

**MR. NOUWENS:** We do. It's Jason Nouwens, Regulatory Affairs Manager. I'm online.

**THE PRESIDENT:** Thank you.

**MR. NOUWENS:** Thank you.

**THE PRESIDENT:** And do we have OPG online?

**MR. GILBERT:** We have Ken Gilbert, Director of Operations Maintenance, Pickering.

**THE PRESIDENT:** Okay.

**MR. DEHDASHTIAN:** Kamyar Dehdashtian, Manager of Regulatory Affairs. I'm online.

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

**MR. GREGORIS:** And it's Steve Gregoris here, Director of Operations and Maintenance at Darlington.

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

Mr. Howden...?

**MR. HOWDEN:** Thank you.

The document was finalized on September 28th, 2015 and I would like to provide an update on the

Status Report as presented in the CMD.

As indicated in the CMD, all units at the Darlington Nuclear Generating Station are currently shut down and in a guaranteed shutdown state for the planned Vacuum Building Outage which began on September 11th.

On Monday, September 28th, 2015, CNSC staff were notified of a partial loss of power which occurred in Unit 1 at Darlington.

A fire alarm sounded and the Emergency Response Team, or ERT, was immediately dispatched to the affected room. The ERT confirmed the presence of smoke but no fire in the room. The Offsite Fire Response Team was called and arrived as a precaution.

The smoke was the result of an electrical fault which caused the automatic electrical protection system to operate per design. The fault caused the loss of some electrical loads and potentially damaged some electrical buses and associated equipment. Effective cooling of the Unit 1 reactor was maintained at all times.

Operators responded to the event in a timely fashion and in accordance with established procedures, which were found to be effective.

The fire detection and electrical protection systems operated as expected and per design.

OPG identified the direct cause as being a



pinhole leak, due to fretting with an adjacent component, in a copper service water line providing cooling to an air conditioning unit above the affected room. Water from the leak pooled and leaked, causing the electrical fault.

OPG advised CNSC staff that information about this event would be posted on their external website. CNSC will also do the same on our website.

OPG is investigating for damage to electrical buses and associated equipment. If any damage is found, it will be repaired and loads re-established prior to unit start-up, following the Vacuum Building Outage, expected to take place around October 8th.

CNSC staff have been monitoring the situation in the field and will follow up on aspects of this incident as information becomes available. In particular, CNSC will be looking at why water was able to find its way into this room and to the extent of condition across the plant. The Commission will be updated if matters of interest become apparent.

There was no threat to the safety of the public, employees or the environment as a result of this occurrence.

I would also like to emphasize that the Pickering Comments section references to Units 4 and 6 are presented for information purposes due to media interest on

the supply shortage in the Province of Ontario. We have no safety concerns.

And with Point Lepreau, reactor power is now at 35 percent of full power. Synchronization to the grid is pending calibration of a level control valve on the non-nuclear condensate system. NB Power has tested the containment system and confirmed that it is available.

This concludes the Status Report on Power Reactors.

CNSC staff are now available to answer any questions the Commission Members may have. And, as you noted, Dr. Binder, industry reps are also available via telephone.

Thank you.

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

So let's jump to the question session and let me start with Dr. McEwan.

**MEMBER MCEWAN:** Thank you, Mr. President.

I really have one question which is simply to try and ensure that people who are not technically au fait with some of the language understand. Can you explain to me what a high generator stator is and what the implications are of an increase in the temperature from the Pickering report?

**MR. HOWDEN:** I will ask Mr. Santini to

respond and the licensee is available as well.

**MR. SANTINI:** Miguel Santini for the record.

This is a component related to the electrical generator. Perhaps to give you more details, I would like Mr. Ken Gilbert to provide them from OPG.

**MR. GILBERT:** Ken Gilbert for the record, Ontario Power Generation.

The stator bars are the stationary portion of the generator. They are cooled with water and circulated to the bars. You know, as we generate electricity there is some lost heat or some lost energy that comes out as heat in those bars. We have two heat exchangers in the system that transfer that heat to service water to maintain the generator cool.

In this case we have one of the heat exchangers out of service for maintenance and because of the time of year we are seeing fouling of the in-service heat exchanger. Today we are continuing our repair of the out-of-service heat exchanger and expect to return it to service.

So what this means is, as we can reject less heat to the in-service heat exchanger, we reduced power on the unit because the amount of heat that needs to be rejected is a function of the amount of electricity that

we do produce, and as well it gives us margin in case we saw either a swing in lake temperature, which could potentially, you know, once again increase temperatures, or if we were to see further fouling.

So this is an economic penalty to us. We expect to have this resolved by end of day Friday and have returned an in-service clean heat exchanger on Unit 1.

**MEMBER MCEWAN:** Thank you.

So this is really a very precautionary measure to ensure that there is no risk. Before you return it to service, it will be inspected by CNSC staff?

**MR. GILBERT:** It's Ken Gilbert for the record.

The heat exchanger we are working on is supported by the manufacturer. There would be no reason for the CNSC to inspect that heat exchanger. You know, that is a normal maintenance practice. We would swap between heat exchangers, ensuring that, you know, we have clean heat exchangers.

It is a cautionary piece around managing electricity production and at this point in time I would not be consulting with the regulator on that. There is no reason. It is strictly a conventional component.

**MR. SANTINI:** Miguel Santini for the record.

Thanks, Mr. Gilbert, for answering the question for us.

But yes, we will not be involved in an inspection because risk-wise this is an insignificant event for us.

**MEMBER MCEWAN:** Thank you.

**THE PRESIDENT:** Thank you.

Ms Velshi...?

**MEMBER VELSHI:** Thank you, Mr. President.

Two questions. The first one on the lost time injury that has been reported for Pickering, how long was the employee off work for that one?

**MR. GILBERT:** It's Ken Gilbert for the record.

So for this event, this is a pre-existing condition for the worker. It's a knee injury. The worker had previously had surgery to make repairs to their knee. When they did trip and fall, we didn't have indication that there was a problem with the knee, but about approximately a week later complications associated with that surgical procedure were evident.

That worker has not returned to full duties as of yet but we continue to work with them and the medical practitioners to return them to full duties as a maintenance worker at the power plant.

**MEMBER VELSHI:** Thank you.

My second question, and I know it's not necessarily safety-related, is this delay of outages as a result of electricity supply needs. Does that happen often and what are the implications, if any, from nuclear safety or a safety perspective?

Maybe OPG can answer the first part and staff the second part. So do you get requests from IESO often to change your timing of outages?

**MR. GILBERT:** Ken Gilbert for the record.

It is not common. The issue at this time was the significant reduction in available generation with Darlington in the vacuum building outage and specifically generation available in this portion of the province in the area of the Pickering Power Plant and the Darlington Power Plant. That coupled with the unusually high September temperatures we experienced that week led the province essentially to cautiously ask for a delay to make sure that we had margin for generation.

**MEMBER VELSHI:** Thank you.

**MR. HOWDEN:** Barclay Howden speaking.

From a nuclear safety perspective, normally there wouldn't be an impact. In this case it was a planned outage, so obviously there was some flexibility in being able to move it.

The issue from nuclear safety would be whether they were in a situation where they had to take a forced outage because of -- to do repairs. At that time our expectation would be they would take the forced outage and then the province would have to deal with any loss of electricity.

**MEMBER VELSHI:** But even in a planned outage there may be some regulatory testing that needs to be done and I guess you would need to weigh the implications of delaying those?

**MR. HOWDEN:** Absolutely for sure, yes.

**MEMBER VELSHI:** Thank you.

**THE PRESIDENT:** Thank you.

Monsieur Harvey...?

**MEMBER HARVEY:** One question about Darlington. What is the nature of the work being done in the vacuum building and are you just working in the vacuum building but you are also working on the reactor at the same time?

**MR. GREGORIS:** It's Steve Gregoris here from Darlington Nuclear Generating Station for the record.

So nature of work for the vacuum building outage, right now we are into a phase, we call it Phase 3 of the work, so emergency service water is unavailable and we are replacing both piping and valves on that system.

It's a system that clearly needs all units shut down and a lot of different constraints put in place to allow us to do that, but it is a piping replacement, valve replacement happening with that system.

In parallel with that, the vacuum building structure is unavailable, containment unavailable to the -- is available, sorry, to the units, but the vacuum building is unavailable. That is for inspections of concrete and for specific work on valves associated with the containment that connect the unit containment to the vacuum building. So we call those the pressure relief valves. Those are the main items being worked on in the vacuum building.

**MEMBER HARVEY:** Thank you.

Staff, I suppose you are following that work and having some inspections too?

**MR. RINFRET:** Yes. François Rinfret for the Darlington Regulatory Program.

Indeed, we are monitoring the inspection like we do at most outages. The vacuum building outage is interesting because it allows entry into areas that are normally inaccessible. The vacuum building, for example, is a component that serves all the reactors. So having all reactors offline allows entry to do these inspections of concrete and other components within the structure. We have actually an inspection team there as we speak.



It also allows for the licensee to validate the assumptions that were made about the quality and the status of components before they enter into the refurbishment and start putting dollar figures. There is an element of verification of status of components. That was already planned from the many years of planning pre-refurbishment unit.

One example is allowing divers to go into the intake channel. This channel would normally not be interesting and available to go in as it takes water and sucks it in for the cooling of the four reactors. The reactors being down from power, it allows us this inspection of the structures in that part of the plant.

**MEMBER HARVEY:** Okay. Thank you.

**THE PRESIDENT:** Monsieur Tolgyesi...?

**MEMBRE TOLGYESI :** Merci, Monsieur le Président.

I'm going back a little bit to Unit 1. When you are talking that high generator status temperature rise, what is the potential consequence of this?

**MR. SANTINI:** Miguel Santini for the record.

Well, the function of the cooling system of the generator is to keep the temperatures within the design parameters by the manufacturer. So I guess one of

the potential consequences is damage to the equipment if the temperature is not maintained below those margins.

**MEMBER TOLGYESI:** And you were saying that this heat build-up was due to heat exchanger maintenance, one of two heat exchanger maintenances. Did you experience kind of heat-ups in the past? Because usually you have heat exchangers maintenance, one or the other one? So did you experience those kind of heat-ups building?

**MR. GILBERT:** Ken Gilbert, Ontario Power Generation, for the record.

This is a system that we closely monitor. We have had to reduce power on units in the past at Pickering and at other power plants for, you know, reduced cooling capability on the system.

You know clearly it's a function of -- lake temperature is one of the important ones and lake temperature is at its highest in September. There is a sort of thermal lag as the lake warms up. So September is a month where we do, in fact, see a higher number of times when we would need to de-rate units for not being able to reject all the heat either from the stator cooling system or for potentially other systems that rely on lake temperature.

So you know we do monitor it. The normal practice, the operating manuals direct the operator to

reduce power and to limit power manoeuvres on units as the temperature does rise on these systems. That's the normal way to manage this kind of reduction or degradation of cooling capability.

And in parallel with that, you know, we would move to expedite maintenance on paired heat exchangers.

**MEMBER TOLGYESI:** My last, sorry, is regarding Point Lepreau.

You are saying that in accordance with licence requirements the unit must be placed in a shutdown and depressurized state. So what governs the limit of eight hours? Because here it was 10 hours and the shutdown is kind of a major consequence. So what governs the limit of eight hours the unit must be placed in the shutdown for the repair? Why not 10, 12, eight or six?

**MR. POULET:** Thank you. Ben Poulet for the record.

The limits vary depending on the safety system and they are based on the amount of time that the -- it's based essentially on risk, on the amount of time the system can be considered unavailable with the probability of an accident or an initiator occurring, an initiating event occurring. So the licensees are required to -- the CNSC requires licensees to have testing programs to ensure

the systems are available to meet the safety functions and the program is built so that they can detect malfunctions or impairments within certain predetermined limits.

So this is what happened here. This was a routine test and it's based on the testing program for Point Lepreau and for the containment system. It detected the failure and proceeded according to the limits that are specified in the licence.

**THE PRESIDENT:** I would like to piggyback on this. So any time you shut down the plant that is a serious malfunction. Isn't it a bit premature to have a defective valve for a relatively new refurbished plant?

I mean I am trying to understand why was this -- why was the valve malfunctioning and why did it take eight hours to fix it? I thought replacing -- I thought replacing a valve is relatively simple.

**MR. POULET:** These valves are not as simple as they may appear. They are fairly large valves. There are -- and also the limits on leakage are also quite low, meaning that for the valve to be considered available it has to essentially be perfectly tight. In this particular case the leak rate was slightly above the acceptable limits and so it was deemed -- considered to be unable to meet its function.

In terms of the maintenance on these

valves it has been done on a regular basis. It is not necessarily a refurbishment item and I can let the people at -- Mr. Jason Nouwens from NB Power can maybe elaborate on the maintenance programs for these valves.

But essentially the limits on these valves are quite strict. They are -- they require a shutdown because essentially they are part of the containment envelope which in the event of a severe accident would be absolutely required to be leak-tight. In this particular case it was found to be slightly above the limit and so the shutdown and cool down of the reactor was required.

The specific wording of the limit is that when the unavailability of the component or the valve is detected, the licensee has to come up with a viable executable maintenance strategy within a period of four hours and must be able to complete that strategy within eight hours. That's the limit that is specified or imposed by the CNSC.

**THE PRESIDENT:** Point Lepreau, do you want to comment?

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

I guess I would like to comment is that the requirements that are in our licence and that are -- as was already stated come from our safety analysis, are

prescriptive and conservative and the intent is to maintain defence in-depth with respect to nuclear safety.

So the requirements are quite strict and during our routine testing, as was mentioned, if we reach a situation where we can't confirm the leak tightness of these containment valves the requirements are quite prescriptive to put the plant in a safe state until those repairs can be completed. So we followed our governance, stayed within our process and completed those repairs.

It may seem like it is extreme to place a reactor in a shutdown state but it is, from a nuclear safety defence in-depth point of view, it is the correct and the proper thing to do.

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

Anybody else, any other questions?

Just one for Pickering again, the unplanned outage of September the 16th it states here that OPG has initiated a root cause assessment. Do we now, by now, know what the root cause is, OPG?

**MR. GILBERT:** Ken Gilbert, Ontario Power Generation, for the record.

We do not have a final answer for that. I can make that available.

We do know that we had a loss of power to the component. The components are designed to fail in a

safe way. Generally speaking, components at nuclear power plants are designed that way. They are a loss of power or a loss of instrument air or some other component that drives it.

In this case it was the governor valves which manage the flow of steam from the boilers to the turbine. If there is a detection of a high level in a boiler which could cause water to be carried over to the turbine, the governor valves detect that high level and close.

In this case the component that was designed to detect that had a loss of power so it went to its safe state. We did not have a high level in the boiler, but on loss of power to that component the governor valves came closed and we had a reduction of power on the unit and we went through a poison out.

Why we lost power is a piece we don't have final understanding on. It's important that we do a detailed review and critically examine the cause of loss of the power supply to this component. And we will continue to do that. It's a detailed technical investigation and when that information is available it will be shared with the regulator.

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

Anything else; any other incidents, events

to report?

**MR. HOWDEN:** Not that we are aware of.

Thank you.

**CMD 15-M39/15-M39.A**

**Oral Presentation by CNSC Staff**

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

I would like to move on to the next item on the agenda which is the *Regulatory Oversight Report for Uranium and Nuclear Substance Processing Facilities in Canada: 2014*. This is outlined in Commission Member Document CMDs 15-M39 and 15-M39.A.

A separate report will be presented later today on the Uranium Mine and Mills Facilities.

The public was invited to comment in writing. The Commission received two submissions from the public.

The report is separated in two components. The first part is on the Uranium Processing Facilities and the second part is on the Nuclear Substance Processing Facilities.

So we will discuss the first part and then have questions on that particular section and then move on to the second part.



Before starting let me test technology again.

I understand that we have Cameco online. Cameco...?

**MR. MOONEY:** Yes, President Binder, it's Liam Mooney, for the record.

**THE PRESIDENT:** Okay, welcome.

**MR. MOONEY:** And joined by Tom Smith.

**THE PRESIDENT:** Anybody else was there? Anybody -- okay, people from Saskatoon are you online? Can you hear us?

**MR. MOONEY:** Yes, it's Liam Mooney for Cameco Corporation and I have Tom Smith with me as well.

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

So I understand that staff will make their presentation. So Dr. Newland, the floor is yours.

**DR. NEWLAND:** Thank you.

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

With me today is Mr. Michael Rinker, Director of the Nuclear Processing Facilities Division; Robert Buhr and Robert Dwyer who are both project officers within the same division.

We also have licensing and compliance staff as well as subject matter experts with us to help answer any questions that the Commission may have.

We are here to present Commission Member Document CMD 15-M39 entitled, "*Regulatory Oversight Report for the Canadian Uranium and Nuclear Substance Processing Facilities: 2014.*"

I will now pass the presentation to Mr. Michael Rinker. Thank you.

**MR. RINKER:** Good Morning, Mr. President and Members of the Commission.

My name is Michael Rinker, and I am the director of the Nuclear Processing Facilities Division at the Canadian Nuclear Safety Commission.

Our presentation today starts with a brief overview on how the CNSC rates licensees' performance as well as an overview of how we provide risk-based compliance oversight.

This is followed by safety performance highlights of each facility which include updates on specific information that has been requested by the Commission.

Finally, we will provide CNSC staff's conclusions on the performance of both uranium and nuclear substance processing facilities in 2014.

The Canadian Nuclear Safety Commission regulates Canada's uranium and nuclear processing facilities to protect the health, safety and security of Canadians and the environment.

The CNSC achieves this mandate by licensing these facilities and providing regulatory oversight through compliance inspections and desktop reviews.

The report provided in Commission Member Document 15-M39, and this presentation, are organized by industry sector, covering uranium processing facilities first, followed by nuclear substance processing facilities. The information presented covers the 2014 calendar year and, where appropriate, compares information amongst facilities and to previous years.

CNSC staff use 14 Safety and Control Areas to evaluate each licensee's performance which are listed on the right-hand side of this slide.

The licensee's performance in each Safety and Control Area is continually assessed by CNSC staff. Each Safety and Control Area has an associated rating which could be "Fully Satisfactory", "Satisfactory", "Below Expectations" or "Unacceptable". A licensee's performance is measured by the ability to minimize all risks posed by the licensed activity and to comply with all regulatory

requirements.

Licensing and compliance activities enable the CNSC to provide assurance to Canadians of the continuing safety performance of licensees.

CNSC staff assess the level of risk associated with each facility across all 14 Safety and Control Areas. The level of risk is reflected in CNSC staff's facility-specific compliance plan which includes the number and the scope of inspections, and reviews of operational activities and licensee's reports. Areas that are more significant to safety such as radiation dose -- worker radiation dose control and effluent monitoring are the subject of more frequent and in-depth verification. Compliance plans are continuously reviewed and revised to take into consideration changes in licensee's performance and lessons learned.

To complement these compliance activities, CNSC staff also conduct independent environmental monitoring in and around licensee's facilities.

The CNSC conducts this independent environmental monitoring to verify that the public and environment around CNSC-regulated nuclear facilities are not adversely affected by releases to the environment. This verification is achieved through independent sampling and analysis by CNSC staff of the air, water, soil,

vegetation, and various foods.

This slide shows where the CNSC has conducted independent environmental monitoring in 2014 and also those that are planned for 2015 and 2016.

All the data is collected and analyzed and all of the monitoring results will be posted on the CNSC's website.

The format of this regulatory oversight report for Canadian Uranium and Nuclear Processing Facilities is similar to previous year's and focuses on the three Safety and Control Areas of radiation protection, environmental protection, and conventional health and safety which cover the key performance indicators for Uranium and Nuclear Substance Processing Facilities.

Also highlighted in the report are ratings for all 14 Safety and Control Areas, a discussion of events that occurred in 2014, any significant facility modifications and areas of increased regulatory focus. The report provides the basis for CNSC staff conclusion that the uranium and nuclear processing facility industry has performed safely in 2014 and progress continues to be made in the engagement of members of the public.

All public information programs for uranium and nuclear processing facilities are in compliance with Regulatory Document 99.3 *Public Information and*

*Disclosure* and all licensees are actively informing their target audiences about their nuclear-related activities.

Further details on GE Hitachi Canada's Public Information and Disclosure Program are provided later in this presentation.

The 2015 annual regulatory oversight reports will be or have been presented to the Commission on dates provided in this slide.

The next scheduled Regulatory Oversight Report for Uranium and Nuclear Substance Processing Facilities is planned for the fall of 2016.

I will now pass the presentation to Mr. Robert Buhr, an inspector with our division who will continue with the presentation.

**MR. BUHR:** Good morning, Mr. President and Members of the Commission. My name is Robert Buhr and I am a project officer in the Nuclear Processing and Facilities Division and also an inspector.

I will now present CNSC staff's assessment on the performance of uranium processing facilities.

The nuclear fuel cycle begins with uranium being extracted from the ground and ends with its disposal following its use in the generation of electricity. The term "cradle to the grave" is commonly used to describe the nuclear fuel cycle. Uranium processing facilities are part

of the nuclear fuel cycle including, refining, conversion and fuel manufacturing.

Cameco's Blind River Refinery receives uranium concentrates, commonly referred to as yellow cake, from mines and mills worldwide. The yellow cake is then refined to produce uranium trioxide. This is an intermediate step in the conversion process.

The uranium trioxide is then transported to Cameco's Port Hope Conversion facility where it is converted into either uranium dioxide for the use in the manufacturing of CANDU reactor fuel or uranium hexafluoride. Uranium hexafluoride is exported by Port Hope Conversion Facility for further processing, later used as fuel in light-water reactors.

Cameco fuel manufacturing and GE Hitachi Nuclear Energy Canada process uranium dioxide powder into natural uranium pellets that are used in the manufacturing of CANDU nuclear fuel bundles.

This table presents the licensing and compliance effort from CNSC staff in 2014. CNSC staff performed 16 compliance inspections at the uranium processing facilities. All the findings resulting from these inspections were provided to the licensee in detailed inspection reports. All enforcement actions arising from the findings were recorded in CNSC's regulatory information

bank to ensure all enforcement actions are tracked to completion.

1,119 person days were dedicated to compliance activities in 2014. This was accomplished through inspections, desktop reviews of activities and processes and through the review of licensee reports. CNSC staff monitor uranium processing facilities to enable staff to provide assurance to Canadians of the continuing compliance and safety performance of licensees.

In 2014, CNSC staff spent 140 person days on licensing activities at uranium processing facilities. There were no licence amendments for any of the facilities. However, considerable effort was spent on modernizing the licence conditions handbooks for these facilities.

In 2014 performance ratings for each of the 14 Safety and Control Areas were determined by CNSC staff based on the results and observations from inspections and desktop reviews. For 2014, all of the uranium possessing facilities received a satisfactory rating in all Safety and Control Areas.

GE Hitachi Canada received a rating of fully satisfactory for environmental protection in recognition of its continued advanced pollution abatement technologies and their achievement of keeping releases of uranium to very low levels.



The Blind River Refinery received a rating of fully satisfactory for Conventional Health and Safety in recognition of nine continuous years without a worker lost time injury.

Overall, these ratings indicate adequate management of safety and control measures at all facilities.

The graph on this slide shows the average and maximum individual effective doses in 2014 for all uranium processing facilities.

The red line on this chart displays the 50 milliSieverts regulatory effective dose limit that a nuclear energy worker can receive in a year. As shown, doses to workers at all uranium processing facilities are well below the annual regulatory dose limits.

Similarly, this graph shows the average individual effective radiation doses for workers from 2010 to 2014. The average dose received by an individual worker at each of the uranium processing facilities was well below the annual regulatory dose limit of 50 milliSieverts, and was similar to previous years. The results also show that the doses to workers have been relatively consistent over the past five years.

This slide provides the dose to public from each uranium processing facility from 2010 to 2014.

Doses to the public from all uranium processing facilities continue to be well below the regulatory limit of 1 mSv per year.

Beginning in 2014, GE Hitachi Canada Toronto implemented a more sensitive method for determining public dose. Due to this change, the calculated dose to the public in 2014 increased slightly from previous years.

Trending at Cameco's Fuel Manufacturing facility shows a decreasing public dose from 0.042 mSv in 2011 to 0.018 mSv in 2014. The decrease in dose is a result of improved storage practices of finished fuel bundles.

To confirm the effectiveness of emission abatement systems and to monitor the impact of uranium emissions from the facility on the environment, all facilities, except GE Hitachi Canada in Peterborough, operate "high-volume" air samplers. A risk assessment for GE Hitachi Canada's Peterborough facility has demonstrated that ambient air sampling is not required since the measured releases from the stack already result in levels lower than the Ontario Ministry of the Environment and Climate Change standard for uranium in ambient air that will take effect on July 1, 2016.

The results from the high-volume samplers from 2010 to 2014 are shown in this slide and indicate that the maximum annual average concentration of the uranium

ambient air measured around any uranium processing facility was much less than the ambient air standard for uranium and indicate that the environment and people are protected from airborne releases.

Soil monitoring programs are intended to monitor the long-term effects of air emissions to show whether there's an accumulation of uranium and soil in the vicinity of the facility. This slide shows the average annual concentrations in soil. The data for all the facilities is well below the Canadian Council of Minister of Environment's guideline of 23 micrograms per gram uranium for residential and parkland use.

Soil sampling results in 2014 continue to indicate that current uranium emissions from uranium processing facilities are not resulting in levels observed in soils that would pose a risk to people or the environment.

I've shown in this slide the number of recordable lost time injuries in 2014 at the uranium processing facilities was low. Because the frequency of lost time injuries have always been low at these facilities, there are no trends with respect to the number of lost time injuries reported to the CNSC.

CNSC staff conclude that the uranium processing facility licensees have been implementing their

conventional health and safety programs satisfactorily during 2014 and their programs were effective in protecting the health and safety of persons working in their facilities.

In the next few slides, I will provide some specific highlights from each uranium processing facility for 2014, starting with the Blind River Refinery.

Cameco's Blind River Refinery, or BRR, is a Class 1B nuclear facility located in Blind River, Ontario. BRR's licence is valid from March 1st, 2012 to February 28th, 2022.

In 2014, BRR made two process modifications, including an upgrade to a storm water ditch, to divert water runoff from an outdoor storage pad to a storage lagoon. The storm water captured in the lagoon is monitored and, if necessary, treated before being released to Lake Huron.

BRR has planned and contracted a company to construct a berm for the protection of the facility in the event of a flood. The berm was recommended by a third party BRR contracted to review the site safety case following the Fukushima accident. Construction is under way and is to be completed in the fall of 2015.

On October 15th, 2014, CNSC staff met with the Mississauga First Nations land and resource committee

and two community Elders. CNSC staff gave a presentation, including background information, on how CNSC regulates CNSC staff's approach to aboriginal consultation, and many questions were asked, with a significant focus on environment monitoring programs, protection of health, and the future of the facility.

This meeting was supported by the Canadian Nuclear Safety Commission's participant funding program.

CNSC staff will be meeting with the Mississauga First Nations lands and resource committee again on October 6th, 2015 under the participant funding program.

Discussions will be held on the 2013 and 2014 environmental monitoring results conducted under the CNSC's independent monitoring program.

Independent environmental monitoring results are now available on the CNSC web site.

In 2014, BRR had no regulatory limit exceedances. BRR had seven radiation protection action level exceedances, and no environmental action level exceedances in 2014.

The action level exceedances were related to workers' radiological exposures.

Please note that there is an error on the slide where the 10 millisievert monthly action level

indicates it is for extremity dose. The action level is for a monthly skin dose.

BRR investigated each exceedance and determined that three of the action level exceedances were not representative of the affected workers' exposure, resulting in a dose below the facility's action level.

Please note that the number of exceedances reported in CMD 15-M39 states that there were two action level exceedances considered non-personal. However, since the time this CMD was published, BRR completed an investigation into the third action level exceedance that resulted in a dose below BRR's radiation action level. Therefore, of the seven reported radiation protection action level exceedances, only four were true, authentic doses.

In all instances, BRR reported, investigated and implemented corrective actions within a timeframe accepted by CNSC staff. It is important to note that all workers' radiological doses were well below the corresponding CNSC dose limits and there are no risks to their health and safety as a result of these action level exceedances.

In 2014, there were no environmental licence limit or action level exceedances at BRR. BRR has implemented an effective occupational health and safety

program which has resulted in BRR's ability to keep workers safe from occupational injuries. The refinery has achieved nine years without a lost time injury.

CNSC staff are satisfied that BRR continues to protect the health and safety of workers and the environment.

I will now discuss the Port Hope Conversion Facility.

Cameco's Port Hope Conversion Facility, or PHCF, is a Class 1B nuclear facility located in the Municipality of Port Hope, Ontario. PHCF's licence is valid from March 1st, 2012 to February 28th, 2017.

During the 2014 period, there were no significant process modifications that affected safety systems. Vision in Motion is Cameco's plan to clean up and renew the Port Hope Conversion Facility.

In 2014, Cameco continued to make progress with the project planning and program activities with respect to the Vision in Motion project. Cameco's request to carry out the Vision in Motion project will be included in its licence renewal application for the Port Hope Conversion Facility.

The application is expected in early November 2015. In the interim, Cameco continues to plan for and carry out other clean-up and remediation activities

that are within the current licensing basis.

CNSC staff conclude that the groundwater monitoring program, including the pump and treat wells, has been performing as expected. The groundwater quality across the Port Hope Conversion Facility site in 2014 has not changed relative to the groundwater quality in previous years.

In 2014, CNSC staff presented to the Commission two event initial reports. The first event occurred in January 2014 involving a recirculation valve in the uranium hexafluoride plant cell room. This event was presented to the Commission in February 2014 and again in more detail in June 2014, as captured in Commission Member Document 14-M36.

There were no injuries and no releases within or outside the facility as a result of this event.

In November 2014, a small amount of anhydrous hydrogen fluoride was released within the uranium hexafluoride plant. In December 2014, CNSC staff presented an event initial report to the Commission in Commission Member Document 14-M83.

Cameco has provided a corrective action plan in response to CNSC staff's December 2014 follow-up reactive inspection to this event. Cameco has also completed a root cause investigation identifying additional



corrective actions as a result of this event.

In both cases, CNSC staff reviewed the investigation reports and associated corrective actions sent by Cameco, and found them to be acceptable.

CNSC staff are satisfied that Cameco has taken appropriate measures to ensure that the facility continues to operate safely.

In 2014, there were no regulatory limits or action levels exceeded. There was one lost time injury in 2014 where an employee tripped on a raised drain in the floor, causing an injury to the worker's right shoulder.

Cameco performed an investigation resulting in actions to prevent reoccurrence. CNSC staff reviewed and accepted the corrective actions.

CNSC staff are satisfied that Cameco's Port Hope Conversion Facility continues to protect the health and safety of workers and the environment.

I will now discuss Cameco Fuel Manufacturing facility.

Cameco Fuel Manufacturing, or CFM, is a Class 1B nuclear facility located in Port Hope, Ontario. CFM's licence is valid from March 1st, 2012 to February 28th, 2022.

In 2014, CFM implemented several upgrades to its facility and equipment to further enhance their

manufacturing process, including the relocation of the bundle manufacturing system and the installation of a new powder receiving/powder preparation area.

Cameco renewed its fuel services division internal dosimetry licence to perform *in vivo* lung counting to ascertain internal doses of CFM workers. Previously, workers' doses were ascertained by urine analysis.

CNSC staff reviewed and accepted the changes made to CFM's dosimetry program.

CFM has undertaken a review of all its regulatory results following the discovery of calculation errors in its 2013 urine analysis results and liquid discharge volume to the sanitary sewer in 2014. The review considered the methods used for the analysis and the calculations, the controls in place and the verification requirements.

The review also incorporated lessons learned and best practices from all facilities within Cameco Fuel Services Division.

CNSC staff are currently following up on CFM's review.

In 2014, there were no regulatory exceedances. CFM had two radiation protection action level exceedances related to workers' internal doses. On two separate occasions, two workers in separate work groups

with different job functions were determined to have received quarterly internal doses of 2.94 millisieverts and 1.74 millisieverts, respectively, which exceeded CFM's internal dose action level of 0.8 millisieverts per quarter.

Both exceedances were reported to the CNSC as required and appropriately investigated. In both cases, CNSC staff were satisfied with the corrective actions that were implemented to help prevent reoccurrence.

In 2014, there was one environmental action level exceedance of CFM's liquid effluent action level. Cameco's investigation determined that maintenance work being performed on the sewer lines dislodged sediment build-up on the sewer pipe walls, causing an increased concentration of uranium release to the sanitary sewer system.

CFM identified possible sources from where the uranium may have entered the sewer system and took corrective actions to prevent a similar incident. CNSC staff found CFM's investigation and corrective actions to be acceptable.

CFM has implemented an effective occupational health and safety program that keeps its workers safe from occupational injuries. CFM has not had a lost time injury in the past three years.

CNSC staff are satisfied that CFM continues to protect the health and safety of workers and the environment.

I will now discuss GE Hitachi Nuclear Energy Canada's facilities in Toronto and Peterborough.

GE Hitachi Nuclear Energy Canada Incorporated, or GEH-C, operates a facility in Toronto and Peterborough under a single Class 1B nuclear facility licence. GEH-C's licence is valid from January 1st, 2011 to December 31st, 2022.

In 2014, there were several improvements to plant equipment and processes, including lead shielding added to the bundle assembly area, a new deionized water system for fuel processing, a rearrangement of the bundle rework area, upgrades to the fire sprinkler system, a new distribution panel for certain equipment in Toronto, and a security and monitoring upgrade.

GEH-C also embarked on a significant change to their training methods with the implementation of a systematic approach to training. The training was developed to align with the Canadian Nuclear Safety Commission's Regulatory Document 2.2.2 titled "Personnel Training" that was published in June 2014.

Both facilities also transitioned to new maintenance management software that allows GEH-C to

identify critical to safety assets and parts for more efficient preventative maintenance program.

In 2014, there were no regulatory limits exceeded. GEH-C had one radiation protection action level exceedance that occurred at the Peterborough facility where a worker's dosimeter recorded a quarterly whole body dose of 6.24 millisieverts. Subsequently, GEH-C investigated the exceedance and concluded that the majority of the dose was non-personal, as the dosimeter was stored in an area of elevated dose rate instead of in the designated badge rack.

A dose change request from 6.24 millisieverts to 0.9 millisieverts has since been approved by CNSC staff.

There were no environmental action levels exceeded.

There was one lost time injury at GEH-C Toronto's -- at the GEH-C Toronto facility in 2014. The incident was related to a foot injury by an operator carrying fuel pellets.

GEH-C performed an analysis of the event to identify root causes and implement corrective actions. CNSC staff are satisfied with the corrective actions GE Hitachi has taken.

CNSC staff are satisfied that GEH-C continues to protect the health and safety of its workers

and the environment.

GEH-C continues to be under increased regulatory oversight for the maintenance and implementation of their public information program. In December 2013, a Commission meeting was held in Toronto where GE Hitachi Canada's operational performance was discussed amid numerous intervenors expressing their concerns about the safety of the facility and lack of public information and awareness.

Listening to those concerns, the Commission directed GEH-C to take action to improve its public information program. To date, GEH-C has responded to the issues raised at the December 2013 Commission meeting.

GEH-C continues to evolve and adapt its program to better inform and engage those living and working near the Toronto and Peterborough facilities.

In 2014, GE Hitachi Canada's activities for the Toronto facility included two meetings with their community liaison committee, two community newsletters, and hosted a virtual public information session.

GEH-C also released on its web site their annual compliance report and posted disclosed information as a result of their disclosure protocol.

Looking ahead, GEH-C has provided CNSC

staff with an action plan for 2015 to further improve their communications and community engagement for both facilities. Actions include creating a new position responsible for the public information program, annual open houses for both sites, improvements to the community newsletter, including one for the Peterborough facility, and increased outreach with target audiences.

I will now turn the presentation to Mr. Robert Dwyer.

**MR. DWYER:** Thank you, and good morning, Mr. Chairman and Commission Members. My name is Robert Dwyer, and I'm a project officer in the Nuclear Processing Facilities Division.

I'll be presenting the next part of this presentation on the performance of nuclear substance processing facilities.

These facilities are different from the uranium processing facilities that we just discussed, as their end products are not related to the nuclear fuel cycle for power reactors. The products created by nuclear substance processing facilities have a variety of end uses such as diagnosing and treating cancer, sterilizing items for sanitary reasons such as surgical gloves, and creating self-luminous emergency and exit signs for buildings and airplanes.

There are three nuclear substance processing facilities in Canada, all of which are located in the Province of Ontario. SRB Technologies is a gaseous tritium light source manufacturing facility located in Pembroke, Nordion --

**THE PRESIDENT:** Excuse me. So I don't know -- something that changed in our plan? I thought we were going to stop at the first part before getting into the second part, do our questioning on the first part, and then move into the other facilities.

Was that not the plan?

**DR. NEWLAND:** We're happy to do that if the Commission desires.

**THE PRESIDENT:** Good answer.

--- Laughter / Rires

**THE PRESIDENT:** Okay. I think that's what we're going to do because that's what -- we have some people here on line, and before we get into the question period, I'd like to hear, do we have any comment from Cameco?

Mr. Mooney?

**MR. MOONEY:** Yes, hello. It's Liam Mooney. We do have some opening comments. If we could deliver those now, that would be appreciated.

**THE PRESIDENT:** Please go ahead.



**MR. MOONEY:** Good morning, President Binder and Members of the Commission. For the record, my name is Liam Mooney and I am the Vice-President of Safety, Health, Environment, Quality and Regulatory Relations at Cameco Corporation.

I am joined today by Tom Smith, the Director of Regulatory Compliance and Licensing for Cameco's Fuel Services Division.

Let me start by stating that Cameco's highest priorities are the health and safety of workers and the public as well as protection of the environment. Cameco owns and operates the CNSC-licensed Blind River Refinery, the Port Hope Conversion Facility, and Cameco Fuel Manufacturing, which are all part of our Fuel Services Division.

Across the entire Fuel Services Division, while radiation doses continue to be well below limits and are maintained ALARA, the past three years have also been amongst the strongest years in conventional health and safety performance. As a company, we are proud of the performance of the Fuel Services Division in these areas and want to highlight some of our recent major successes.

As you have heard earlier today from CNSC staff, at the Blind River Refinery we have now reached more than nine years without a lost time injury and more than

five years without a reportable environmental incident.

At the Port Hope Conversion Facility, we have achieved a reduction in total uranium air emissions of more than 50 percent in 2014, improved performance that we have sustained in 2015.

At Cameco Fuel Manufacturing, we continued with the commissioning of additional automation which, in part, helped contribute to the continued strong performance in conventional safety as highlighted by the third consecutive year at the facility without a lost time injury.

Radiation protection and environmental performance continue to be areas of focus at all three licensed Fuel Services Division operations. As CNSC staff have noted in their report, employee radiation dose and emissions to air are a fraction of the regulatory limits and below action levels.

CNSC staff recognize Cameco as a leader in developing and sustaining effective public information programs that inform and engage the citizens of Port Hope. This has contributed to strong public support in the community where 88 percent of residents surveyed supported our continued operation.

By way of an update, Cameco submitted a letter of intent earlier this year to have the conversion

facility relicensing incorporate the Vision in Motion project. Cameco expects to submit the formal application later this year, with a hearing anticipated for some time in 2016.

In closing, all three of these operations have well-established and mature management systems that provide opportunity for systematic improvement while maintaining strong performance.

Cameco remains committed to ensuring that our operations continue to be safe, clean and reliable.

Thank you, and we are pleased to respond to any questions that you may have.

**THE PRESIDENT:** Thank you.

I understand that GE Hitachi also would like to make some remarks, so Mr. Ward.

**MR. WARD:** Yes, thank you. Mark Ward, for the record.

I'll just wait till the presentation comes up, maybe.

--- Pause

**MR. WARD:** Good morning, Mr. President and Members of the Commission. I thank you for the opportunity to present to you our company leadership changes since 2014.

On April 6th of this year, I was appointed

President and CEO of GE Hitachi Nuclear Energy Canada. I've held various roles with the company over the past 17 years, including quality leader, environmental health and safety leader, engineering leader and plant manager, and for the past seven years, I've represented the company at CNSC hearings and meetings as the fuel operations manager.

This slide shows our current management team. Paul Desiri, who is here today sitting on my left, has been the EHS and Regulatory Manager for the business for the past eight years.

The boxes in level -- sorry, in yellow on the slide highlight changes since 2014, which I'll now make note of.

Ted Richardson is now the Nuclear Components Manager and oversees the pellet operation in Toronto and the tubing operation in Arnprior; Walter Volk was promoted internally to the IT Manager after the retirement of the previous IT Manager; Audrey Curtis was hired in August of this year as a Human Resources Manager, who is a rehire to GE, with over 13 years of experience; and sitting to my right is Sara Forsey, who joined our team into a new role for GEH-C as the Manager of Community Relations & Communications. This role was created as part of our updated Public Information and Disclosure Program Action Plan.

We are committed and look forward to continuously improving our public information program through collaboration with the CNSC staff and reviewing best practices across the nuclear industry. I've been able to make these changes over the past few months and am confident that we have a solid foundation for a strong and committed team.

So what's remained unchanged is our management system for ensuring a hundred percent compliance with all applicable regulatory requirements, our commitment to environment health and safety excellence and our commitment to fully meet or exceed CNSC expectations in all safety and control areas and for public disclosure and communication.

Thank you. That concludes my presentation.

**THE PRESIDENT:** Thank you.

I'd like now to open the floor for questions. We should also -- we are aware there's also -- there were two intervenors that submitted written submissions. One is from is from Ms Carolyn Johnson, as described in CMD 15-M39.1, and the other one is from the Canadian Nuclear Workers' Council, described in CMD 15-M39.2.

So, colleagues, we can ask questions on

all of the above, and let start by giving the floor to Ms Velshi.

**MEMBER VELSHI:** I have a quick question on the Canadian Nuclear Workers' Council's submission.

On their second page -- and I don't know whether staff or Cameco can answer that -- they talk about an award that was given to the four top facilities at a USW Health, Safety and Environment Conference.

I just wondered what that body was. Is this the first time ever that an award has been presented to any of these facilities?

**DR. NEWLAND:** I suggest that Cameco respond, please.

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

To our knowledge that's the first time that we received that particular recognition from the USW unions at their conference in the U.S.

**MEMBER VELSHI:** And what is USW?

**MR. MOONEY:** Oh, sorry -- it's Liam Mooney for the record -- it's United Steelworkers. It's the collective unionized workforce at the conversion facility.

**MEMBER VELSHI:** Thank you.

**THE PRESIDENT:** Monsieur Harvey.

**MEMBER HARVEY:** All -- those two...?

**THE PRESIDENT:** All -- no --

**MEMBER HARVEY:** Okay.

**MEMBER VELSHI:** Sorry, I thought it was just the two interventions.

**THE PRESIDENT:** No, no -- well, everybody, the intervention, everything we had this morning.

**MEMBER HARVEY:** It's okay.

**MEMBER VELSHI:** Okay. I'm sorry.

**THE PRESIDENT:** One question per one, and we'll go as many ones as we need to go.

Monsieur Harvey.

**MEMBER HARVEY:** Okay. Merci, monsieur le président.

My first question is about the participant funding program. I thought this program was specific to the hearings and in your presentation you mentioned that this program is utilized for meeting with the Mississauga First Nations' Land & Resource Committee.

So could you explain a little bit the...?

**THE PRESIDENT:** I think we have some staff who came forward.

**MS JOHNSON:** Good morning. My name is Kimberley Noble. I'm the team leader for Aboriginal Consultation in our participant funding program.

So in the last couple of years we've tried

to broaden the participant funding program so that we can encourage further first nation and public participation, where we can assist this participation. So if it's not directly related to an upcoming hearing, we can still help support First Nation and Métis communities, that they can meet with us about our regulated facilities.

And then we've expanded it, so for our -- excuse me -- independent environmental monitoring program, we can get them involved and they can review what we've done, what our programs are, ask -- potentially give us advice or recommendations, and we can work with them on those programs.

Then, they can come to you for future Commission meetings or in annual reports and they can advise you how they've been participating in our programs.

**MEMBER HARVEY:** Well, I thought the program -- there was a committee, and the committee just analyzed your request. First, you have to make the request to have access to that program, and then you have the committee, who decides who will get the money, but is this the same program or...?

**THE PRESIDENT:** It's the same program, but the staff has expanded the eligibility of activities so you can actually financially support going to aboriginal communities and present the CNSC as a regulator.



And also the actual award of cash was for a presentation in front of us. Whenever they come, as we will see this afternoon, there will be a presentation.

So there are different dimensions that are being supported now.

**MEMBER HARVEY:** Fine. In such a case --

**MS NOBLE:** I can add to that, if I can.

So if there's a request that staff meet with a First Nation or Métis community, and they request funding, they still come in with an application. And we still do bring it to our Funding Review Committee, so they still do an assessment, and then they would recommend -- again, they would review, make sure it looks at our criteria, and meets the criteria, and again the value added for your future decision making, and then it would go for approval, so that the funding committee is still involved in all the funding decisions.

**MEMBER HARVEY:** Okay. Okay.

Okay, thank you.

**THE PRESIDENT:** Mr. Tolgyesi.

**MEMBER TOLGYESI:** Merci, monsieur le président.

One is a typo. On page 7 of the report, before the last paragraph, the last line, is "available on the licensees' websites as provided in Appendix I." It

should be Appendix H.

I will go Hitachi.

You are saying, on page 47 -- GE Hitachi Nuclear Energy, you are saying in that paragraph, the last paragraph, that primary hazards are airbourne UO<sub>2</sub> participls and the Peterborough facility also process beryllium that pose inhalation hazards.

Could you expand on this beryllium: what it is, how it's there, do you process it, you produce it, or how you do that, and how you control?

**MR. WARD:** I'm Mark Ward, for the record.

The beryllium comes in in a powder form and it's braised onto zirconium substrate in a vapour deposition chamber. It's actually used as an alloying element to adhere appendages, small pieces of metal, to the tubing itself for the structural integrity of it.

So the beryllium comes in a powder form. Once it's deposited on, it goes through a sintering operation, which at that point it is in a solid form.

**MEMBER TOLGYESI:** Because beryllium is causing lots of consequences as it was measured in smelters, like in metal mine smelters, so that my concerns were there.

**MR. WARD:** So we have a designated area where this takes place, with its own control and air

monitoring systems. It's also a controlled area for employees in specialized training for that particular area, but it's a very small part of our operation to perform this process.

--- Off microphone / Sans microphone

**THE PRESIDENT:** This one, one per person.

Dr. McEwan.

**MEMBER MCEWAN:** Thank you, Mr. President.

Maybe it may be helpful to look at page 30 of the CMD, and Figure 4.2. I'd like to use this as representative of a lot of the figures that we have on doses and other calculated effluent emissions and things like that.

If I look through all of the documents that we're being presented with today, there is a lot of variability in the way these graphs are presented. Usually, but not always, they will have the annual regulatory limit; occasionally, they will have CNSC expectations; and I think there are two or three graphs that have action levels on. It would be nice to have some consistency through that.

I'm not actually sure that it is useful to put on these graphs the regulatory limit. It is so far away from what we are seeing as the measured doses, or whatever parameter we're looking at.

Would it be possible, would it be helpful -- I would certainly find it very helpful -- to have consistency across all of the graphs we're presented, but also to actually have the action levels in some way indicated on the graph?

It's a very rapid, visual way of seeing where the individual company is or licensee is in relationship to what their measured values are. I think it would be for people just looking at this report a much, much better understanding of the levels to which we hold the licensee, in terms of safety.

**MR. RINKER:** Mike Rinker, for the record.

So certainly we're -- part of today is we're information gathering on how we can always improve our report, so we're taking note of that.

Action levels I think do serve as a better measure of how well licensees are controlling their facility and their program, so I think that that's a point well taken. I don't want to lose sight of the regulatory limits because those are -- but perhaps it would adjust the scale.

As a caveat for future discussions, for example in next year's report, is we are going through a process on how to improve setting action levels. Facilities are more advanced or less advanced as we go

through this process, so part of our discussion next year may also revolve around, you know, how is that action level set and is it more or less appropriate at that particular time?

So that's a certain grey area that we were avoiding. Up to now we're making sure that as we're improving our setting action levels, but perhaps in a year's time we should -- I think we're ready to have that discussion, so I accept that recommendation.

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

So let's restart our process, and maybe two questions per round here.

Ms Velshi.

**MEMBER VELSHI:** Thank you, Mr. President.

So the first one is a comment, and then I'll have two questions. It's not so much a comment as a suggestion.

I think it would be helpful if, in the executive summary -- and you didn't do it in your presentation earlier today as well -- you were to summarize how your assessment has changed from the past year, when it comes to satisfactory and fully satisfactory and so on that there has been a change, whether it's just maintaining or sustaining improvement, but there has been a decline in one area and an improvement in another area for another

facility.

I think that would be very helpful in the report, so there is just a quick look at how have things really changed at the bottom level. So a suggestion there.

My first question is maybe for Cameco to answer. So this is for the Blind River refinery, where you had four action level exceedances, and all of those are -- at least according to the report -- were working the dried raffinate area.

What I read in the report was that's known to be hazardous, so it wasn't as though that came as a surprise. But then as I looked at what were the corrective actions being taken, it was more around managing of dosimeters.

I guess the ones that you said that did not exceed action levels were probably all tied in with that, but for these four it just says, you know, there's investigations, they'll further look into it. So I'd like to hear exactly what is it that you're doing to make sure that you don't get these unplanned exposures.

Cameco.

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

We do have that robust and mature radiation protection program in place, and efforts are

ongoing to ensure that employee dose remains ALARA. There are opportunities for some operational positions at the refinery to be subject to job rotations, including the raffinate area.

Over the history of the plant, we have looked at various means of reducing employee exposure through the use of shielding, job rotations, procedural changes. It's recognized that the raffinate area has the highest external radiation fields at the refinery and over the years of operation all of those techniques have been used to lower employer exposure when working in that area.

**MEMBER VELSHI:** But having said that, that would seem to indicate that you were not surprised that you exceeded the action levels then, because you know that that's hazardous work and that there's a potential for that.

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

We do not want to exceed the action levels. They're set to indicate a potential loss of control and trigger follow-up investigations and recommendations of corrective action. So it's not the case that we expect to exceed action levels in the raffinate area, it's recognized as having the higher external radiation fields, and over the years of operation we've

looked for opportunities to reduce the exposures in that area.

**MEMBER VELSHI:** But you've had four exceedances in this past year, so what additional effort are you making to make sure this doesn't happen again?

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

In relation to the area in particular, there's been discussions around increased awareness and handling of dosimeter badges to deal with some of the apparent exceedances that were noted in the 2014 report.

**MEMBER VELSHI:** So I'm sorry to belabour this, because I'm still grappling with what does handling of dosimeters have to do with these exceedances? These were real exceedances because of high fields. So other than maybe increased awareness, as you said, I mean is there additional shielding, reduction of work time? Like what else is going to happen?

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

I don't have the specifics of the corrective actions that were put in place as a result of those investigations, but they were put in place with a view to limiting the number of action exceedances in the future, reoccurrence of action exceedances, and they were



verified and accepted by CNSC staff.

**MEMBER VELSHI:** Thank you.

Staff, do you have anything to add to this?

**MR. RINKER:** I'll ask Caroline Purvis, Director of our Radiation Protection Division, to answer this, please.

**MS PURVIS:** Good morning. It's Caroline Purvis, for the record.

So I will wade in a little on the action levels themselves. Certainly Cameco has set action levels for a number of parameters, including whole body exposure, so an external dose that's recorded on dosimeters. We have to keep in mind that those action levels, as currently set, are for all operating areas in the plant, they're not specific for the raffinate area.

As Mr. Mooney mentioned, of course the raffinate area is one in which the radiation fields and the characterization of the exposures presents a higher potential for exposures, both to gamma radiation and beta fields.

Workers, when they do enter that area, it's required that they wear direct-reading dosimeters, and from that point of view certainly controls could be put in place if they -- to monitor in real time daily exposures.

But, as mentioned, the action levels are more of an overall action level, and certainly when we looked at the investigations for these action level exceedances through the investigation it was certainly revealed that there was no loss of control over the program. The doses received were in excess of the action level, but certainly close, and we don't -- we don't have a concern from that point of view.

**MEMBER VELSHI:** So am I correct in concluding that exceeding these action levels, lowers them maybe for this area, should not come as a surprise and no further corrective actions were necessary to prevent a recurrence, that we could expect this in the future?

**MR. RINKER:** Mike Rinker, for the record.

I think Cameco might want to supplement this answer, but I think what we're seeing here is an effective action level. The action levels were set quite tight, based on performance data about two, two-and-a-half years ago, when Cameco was quite busy. Over 2014, they were -- the facility was less busy, and that required worker excursion into the raffinate area more frequently than typical.

So what the action level served to do was to trigger Cameco's awareness and CNSC staff's awareness in the appropriate area that there are exposures that were not

typical of previous years, and drew attention to have those corrective action -- to have that awareness and additional training put in place.

So while there were four action levels last year, which is a relatively high number, the action levels are set quite tight and low, and so we know that workers were not put at risk, but it did draw attention to an improvement to an area.

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

I would only add that we take these action level exceedances seriously and investigations were carried out for all four of them, and corrective actions were identified and have been put in place.

So I would not -- we do not see these as the norm and that we would expect to see four action level exceedances in the raffinate area in 2015. Our goal is to limit the number of action level exceedances across our facilities, including at the Blind River refinery.

**MEMBER VELSHI:** Thank you. I think I'd be interested in seeing exactly what corrective actions came out from these four action level exceedances, please.

My next question is for GE Hitachi.

On page 53 of CMD 14-M39, in slide 15, the dose to the public in 2014 from your Toronto facility went

up. Now I know these numbers are really low, but it went up from .0003 to .0052. The footnote said that it was because you have now started including another pathway, the environmental gamma exposure.

So I just wanted to confirm that that's what's led to the increase, but I guess of greater concern is: so what other pathways are we not including that maybe down the road we would, and that would result in an increase in public dose?

**MR. DESIRI:** For the record, Paul Desiri.

We include all pathways. We include the air pathway and we include water, gamma exposure. I should clarify that prior to 2014, we did monitor gamma exposures using different instrumentation, it just wasn't included in the overall does.

**MEMBER VELSHI:** So when you were measuring it some other way, were the numbers similar to what you came up with in 2014?

**MR. DESIRI:** For the record, Paul Desiri.

It's difficult to make that comparison because it's a different type of instrumentation. The readings given by that instrumentation were zero at the perimeter, as compared to background, so with the new instrumentation in place it's giving the more sensitive readings.

**MEMBER VELSHI:** Okay. Thank you.

**THE PRESIDENT:** Thank you.

Monsieur Harvey.

**MEMBER HARVEY:** Merci, monsieur le président.

The first question is about the groundwater quality for the Cameco Port Hope Conversion Facility.

On slide 27 of your presentation, you mentioned that the groundwater quality "has not deteriorated relative to previous years." Well, it's a strange sentence, because it's not deteriorated, it's okay. Anyway, that's not my point.

My point is trying to relate if there is a connection between that sentence and on page 34 where you report the mass of contaminants that have been pumped from the groundwater. So is there any relation with your sentence and this graph here? If you take all that mass out of the groundwater, at the end of the day, what is the utility, the plus-value of that action?

**MR. RINKER:** Mike Rinker for the record.

I will ask Dr. Shizhong Lei to respond to your question.

**DR. LEI:** Shizhong Lei.

Would you please repeat your question?

**MEMBER HARVEY:** Well, you mentioned that the groundwater has not deteriorated, so it's almost the same as it was before, and during that time you are pumping from the ground a certain quantity, a certain mass of contaminants. So what is the result, what is the utility or the usefulness of such pumping if it's just keeping -- is it because there are some other leaks and it remains stable?

**DR. LEI:** Shizhong Lei.

The contaminants in the groundwater take a long time to reach the groundwater monitoring wells and the pumping wells as well as the shoreline. So those contaminants are -- from historical practice, they are in the groundwater, they are going to be there for quite some time, and there is no deterioration means that it's relatively stable and that there is not identified additional releases to the groundwater.

**MR. RINKER:** Mike Rinker for the record.

If I could add, the ultimate mitigation measure for uranium in groundwater is not the interceptor wells, it is a vision in motion project which is going to do some soil remediation.

The inventory of uranium at the conversion facility is in contaminated soil. Some of that inventory is washing out in groundwater. In order to prevent it from

getting into the turning basin and causing issues in the harbour, interceptor wells are put in place. So we don't see any changes over time. So the problem isn't getting worse. However, those interceptor wells are not the solution, they are just there to intercept until remediation will occur.

**MEMBER HARVEY:** But on a long-term period, are you expecting that this will ameliorate or will change the --

**MR. RINKER:** Mike Rinker for the record.

So what I expect to change is when -- should the Commission authorize the vision in motion project which will be up for hearing in approximately a year from now, soil remediation will likely occur under that program. That's taking away the source of uranium and so that remediation project will cause the uranium levels in groundwater to go down.

In the meantime, these are not just monitoring wells, they are wells actually collecting the contaminated water for treatment. So the wells are a temporary measure to prevent uranium from going into the turning basin.

We would not permit Cameco to keep those wells in for a decade or two to observe the decrease. We need remediation of the contaminated soil to happen before

that.

**MEMBER HARVEY:** Okay. That's two different things. Yes, okay.

My second question is about the ALARA. When you have the evaluation of all the SCAs it's always satisfactory everywhere and each time you come in front of the Commission you are saying -- and this is the same thing for all the facilities -- that they are working with the ALARA principle and trying to get it lower and lower to protect the public, the environment and things like that, and I'm trying to see what is the plus-value of that because it's not reflected in the overall picture, it's only satisfactory, and I presume that working with those principles should, in a certain time period, bring those evaluations to fully satisfactory, things like that.

Have you ever tried to measure the participation of ALARA in the overall process of evaluation? Can you put a note on the ALARA efforts made by all the facilities?

**MR. RINKER:** Mike Rinker for the record.

I would like to make sure I'm understanding the question correctly. You know, most safety and control areas for most facilities are rated now as satisfactory. There are very rare exceptions where we allow for a fully satisfactory despite knowing there is



considerable work done to lower action levels, lower releases, lower exposures.

So if I understand the question correctly, we do expect continual improvement as a part of how a facility would operate. So facilities who are continually improving is a satisfactory way to operate that facility. So it's an expectation. If they are continually improving they are meeting our expectations, it is not something over and above.

To get fully satisfactory means that amongst that area there isn't anything major that needs improvement within that area and they are leading the pack, they're showing the example to the rest of the industry of how to do things properly. So it's really -- it's difficult to achieve fully satisfactory. Despite a company being excellent, it's still difficult to achieve fully satisfactory.

On the other hand, if someone was below expectations you would have heard from us many times. There would be other enforcement actions that we would be bringing to your attention to support that recommendation.

**MEMBER HARVEY:** Because, well, it's so easy just to talk and say ALARA, ALARA, ALARA, and it's difficult sometimes to evaluate in real life what it is. So this is the sense of my question too. Well, hearing

that at each meeting it will be good to see what it does on a long-time period, if it does something or it's just some words. Okay.

**THE PRESIDENT:** Monsieur Tolgyesi...?

**MEMBER TOLGYESI:** Yes. I will have one comment first just to make sure that it will be a little bit clearer, this report.

In some cases, this annual report reports number of employees; in other cases, no. Like in Cameco Fuel Manufacturing you are saying that there are approximately 145 employees, but not in other sites.

When you're talking about personnel monitored you are talking about nuclear energy workers who are monitored and it could happen they are monitored two or three times a year. I think it is according to a program.

I think it would be useful in order to be consistent that you present in each site the number of employees of each, how many are nuclear energy workers, so we will have a sense how many times they are checked.

Like when I'm going to this Cameco site there was 145 employees. I don't know how many of them are nuclear energy workers, but there were 317 monitored, which means that it will be maybe two or three times every employee in nuclear energy on average was monitored. So it would be kind of useful because it presents how strongly we

monitor what we do.

**THE PRESIDENT:** I would like to piggyback on this. I also found that when you described the facilities I don't understand why you don't put the number of employees, the number of contractors, and then somewhere in there somebody says that if a contractor is working more than 80 hours then they are nuclear employees.

You have to be consistent, particularly when you give some of the numbers. And the dosage, whether you measure them in or out, et cetera, it wasn't clear, and I had to go and struggle to find out what's measured here. So I think for consistency you should put in the employees and the contractors very clearly.

**DR. NEWLAND:** Noted.

**LE PRÉSIDENT :** Monsieur Tolgyesi...?

**MEMBER TOLGYESI:** My question, I'm going back to GE Hitachi.

On your last time in December 2013 in Toronto there was a kind of strong request expressed to achieve and implement a robust public relations program. That's what you did because you have personnel also. Could you give us a kind of small, short summary of what did you do since you tried to implement this new program?

**MR. WARD:** Mark Ward for the record.

Yes. Since that time -- I came in on

April 6 -- we have had two meetings with CNSC staff, one around April 21 and then May 8. When we came in on the 21st it was clear, the CNSC staff expectations were made very clear to us, along with the 2013 timeframe.

So what we did is we came up with an updated and enhanced action plan based on input and comments from the CNSC staff. We also went out and looked at best practices within the industry, which was recommended to us, and we came forward with a comprehensive plan which was submitted to the CNSC staff and they have accepted that and they are monitoring that going forward.

Some of the highlights of that plan was the creation of the new position which Sara has now. Within GE we have GE Canada and our headquarters for nuclear is out of Wilmington, North Carolina. In both groups there is a communications group but they are not solely focused on our needs. So that was the reason why we created this process, number one.

And Sara will take over ownership from Paul for the Public Information and Disclosure Program. Some of the highlights in it is having annual open houses both at Toronto and Peterborough, and we have one for Toronto scheduled for this Saturday, a three-hour open house.

We are enhancing the involvement in the

Community Liaison Committee. We had a meeting two weeks ago at which one of the CNSC staff was present. We had large representation from management, the new management I showed this morning. We are going to have another meeting before the end of the year.

We have come up with an editorial calendar where the CLC members, the Community Liaison Committee members, who are members of the public, of the community, actually give us the input on what they want to hear, what they want to discuss and go through. We had a presentation on GE volunteers which was requested by them. I will also point out that the barbecue suggestion came from the CLC.

We are improving the Toronto Newsletter. A new newsletter has come out in the last week. It is posted on the website. We are also creating a regular one for Peterborough. We have done ones in Peterborough in the past but it has been infrequent, so that will become a standard newsletter.

We have also made updates as recommended on the website, both the content, the frequency of posting and the way in which it's arranged, and we are looking at making further improvements on that going forward.

So those are a few highlights that are covered in the detailed action plan.

**MEMBER TOLGYESI:** Do you expect to include

some public representatives to your working committee or kind of public relations committee?

**MR. WARD:** So we do have the Community Liaison Committee, of which there are three members of the public on it currently, yes.

**MEMBER TOLGYESI:** I have one more. I will wait for the next.

**THE PRESIDENT:** Okay.

Dr. McEwan...?

**MEMBER MCEWAN:** Thank you, Mr. President.

Again, just a comment and a suggestion.

It would be helpful to have a definition of action levels in the glossary. I think it sort of helps to continue.

If I go back to page 30, the paragraph immediately below the figure, I'm concerned that a company can include contractors and NEWS in their average dose limits because it does seem to me that it will artificially reduce the average dose limits to the NEWS and I'm surprised that staff would actually allow that.

**MR. RINKER:** Mike Rinker for the record.

I think I will ask Caroline Purvis to respond to that question.

**MS PURVIS:** Caroline Purvis for the record.

Well, in actual fact the staff did recommend that Cameco start including contractors because when you look at the population of workers at Port Hope they are about 50/50 between employees and contractors, 415 employees and 338 contractors. The contractors that are included here are also identified as nuclear energy workers. So certainly, when we present the dose statistics we want to ensure that we are including all of the exposed individuals and how that licensee manages doses to persons.

**MEMBER MCEWAN:** So again, from the point of view of reading the report and trying to understand the report, it would be more helpful to have them reported separately so that you can actually understand if there is a difference in performance or a difference in behaviour between the internal company staff and the external contractors. Again, it seems to me you're losing an important data safety set by ignoring that.

**THE PRESIDENT:** Well, first of all, is there a definition of when a contractor becomes a nuclear employee? I mean is it somebody who's coming for an hour in a plant, are they now part of the population or...? Somewhere in this documentation there's 80 hours mentioned.

**MS PURVIS:** Caroline Purvis for the record.

So each licensee has different ways of

managing contractors and that is part of their radiation safety program.

Certainly, under the Act and under the Regulations, who is a nuclear energy worker is very clear. It is any individual who has a potential to exceed 1 mSv during a one-year period.

So certainly if a contractor was going to enter a facility, whether it be any that are being discussed here today, and there was a potential that they would receive that exposure during the course of the year, they would have to be identified as a nuclear energy worker and captured under the requirements of the licensee's program on how they handle NEWs within their facility.

I can't tell you just off the top of my head which one indicates -- CFM indicates that they have a timeframe spent in the facility to identify whether someone would be a nuclear energy worker. Of course they have to look at the probability of the exposure as the fundamental decision-making criteria and clearly the time spent will impact the exposures.

**THE PRESIDENT:** But then Dr. McEwan's comment is really interesting because then what does the average mean? If somebody comes in for -- I don't know, to provide water to the facility and is there for five minutes, they can lower the average of the facility quite a



bit; right? So I don't understand. Then the average is not necessarily a good indicator. I understand the maximum is a proxy for the maximum dose but the average --

**MS PURVIS:** Thank you very much. Caroline Purvis for the record.

Certainly, you have to understand what the data is representing in order to be able to make conclusions with respect to the averages. I totally agree with you. Each licensee is providing information to us and we will ask questions to ensure that we are giving you consistent information over time.

The example that you did provide, obviously we would assume the fellow who is delivering water shouldn't receive a dose that would make him a nuclear energy worker for the purposes of that work task.

But again, yes, there is much more data that is behind what is presented here. It could be very complex, but for the purposes of comparing facility to facility there is some benefit in providing those averages. Of course we don't have a dose limit for average worker dose. It is per individual and it's either for a nuclear energy worker or a worker who is identified as a non-NEW.

**THE PRESIDENT:** Dr. McEwan...?

**MEMBER MCEWAN:** Okay. So let me pursue this a little bit further with pages 105 and 107.

**MR. RINKER:** Which page?

**MEMBER MCEWAN:** Pages 105 and 107,  
Table -- the tables on both of those pages, for example.

So if I look at Table E-14, over the five years that are reported in this table for maximum individual effective dose, there is significant discordance for GE Hitachi Toronto compared with GE Hitachi Peterborough and Cameco.

And if I look at the Cameco data on Table E-19 for skin dose, again we have high variability, we have a trend upwards.

So were those individual doses received by a nuclear energy worker or were they received by a contractor who was a nuclear energy worker because they were there for a short period of time? Why were the doses quite so high for the individual in 2012? Why are the doses in E-19 showing a trend upwards over the course of five years?

So there are some very specific elements in some of the data you present that are very difficult to understand and that worry me if you are not providing us with the average, the internal nuclear energy worker and the contractor, because I really think that we need to understand the impact of activities on the safety of those two groups of people.

**MR. RINKER:** Dr. McEwan, it is Mike Rinker for the record. I think you are raising a good point.

And something that we would add also, however, is we talked in August under Nordion, where contractors for Nordion have very different roles than nuclear energy workers, than the Nordion employees, and so there is a different pool of data. But that's not consistent throughout the industry.

In the conversion facility there is less a separation in the role of what a contractor does versus what a Cameco employee does and so there was a decision to pool the data based on what activities they do onsite. That's not documented in our report and I think the separation of the data with that description of whether there is a separation in the type of exposures would be helpful.

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

--- Pause

**THE PRESIDENT:** There are lots of questions remaining?

Ms Velshi...?

**MEMBER VELSHI:** My questions are for the Blind River Refinery, pages 24 and 108 of CMD 15-M39, and its groundwater uranium concentration and there is a comment that the 2014 numbers were slightly higher.

Actually they are a lot higher, they went from 3.7 to 8.9 µg/L.

So two parts to the question. One is why did they go up? Secondly, I don't know whether this number is high or not because there is no guideline or a limit provided on what is an acceptable level.

**MR. RINKER:** So I will ask Dr. Lei to respond to that question.

**DR. LEI:** Shizhong Lei.

For the moment, during our review of the annual report, we are paying attention to any trend of contaminants in the groundwater. In this case we just noticed this is the maximum and it is 8.9 µg/L, which is still a very small number, but we are paying attention to the trend and we are also asking Cameco to provide an explanation, but so far we have not received any yet.

**MEMBER VELSHI:** So we could ask Cameco for their comments. Sure, you said 8.9 is a very low number. What is a high number? Because, as I said, there is no guideline or limit against that number to say, hey, here is something that would be a cause for concern.

**MR. RINKER:** Mike Rinker for the record.

I guess for comparison the drinking water -- it is still lower than the drinking water standard.

**MEMBER VELSHI:** Thank you.

Cameco, any comment on why it has gone up?

**MR. MOONEY:** Liam Mooney for the record.

We do have a comprehensive groundwater monitoring program in place at the Blind River Refinery with 43 monitoring wells in the vicinity of the refinery. We do use third-party experts to assist in determining the optimum sampling frequency for each monitoring well and our 2015 groundwater monitoring program is under way and we intend to provide the details of that sampling program to the CNSC as summarized in our 2015 annual report.

**MEMBER VELSHI:** Mr. Mooney, my question was do you know why the 2014 numbers are higher than the 2013 numbers?

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

We don't have -- again, if we go back to the point made by Mr. Rinker, these are extremely low numbers and below the drinking water quality objectives. So we will continue to monitor and if it does become a trend in increasing groundwater then we will investigate further.

**MEMBER VELSHI:** Thank you.

**THE PRESIDENT:** So I want a clarification. Are there drinking water limits for this uranium in water

and why is it not indicated in Table F-2?

**MR. RINKER:** Mike Rinker for the record.

So I did take note that we need to have something to compare such as a standard, so that will be in next year's report. The drinking water standard for uranium is 20 µg/L.

**THE PRESIDENT:** So the next table, where it says Provincial Water Quality Objective, the "5", what does that mean?

**MR. RINKER:** Mike Rinker for the record.

So that is a surface water quality objective for the protection of aquatic life and in this case the drinking water standard would be reasonable to compare to groundwater. Once it gets released to surface water you would compare it to a standard for the protection of aquatic life, which is 5.

**THE PRESIDENT:** So the surface numbers are lower than the drinking? Something doesn't compute here.

**MR. RINKER:** That is correct. This is one of the rare examples when the drinking water standard is higher than the number for protection of fish and aquatic life.

**THE PRESIDENT:** I think an expert came forth here.

**DR. THOMPSON:** Pasty Thompson for the

record. I am the Director General of the Directorate of Environmental Protection, Environmental Radiation Protection and Assessment.

Essentially it is not rare for surface water quality objectives to be lower than drinking water standards, essentially because biota spend all of their life and do all of their activities in water. For drinking water standard it is quite typical that based on humans consuming 2 litres per day that the numbers are protective of human health but often higher than surface water quality objectives.

In terms of appropriate numbers to compare groundwater monitoring values on an industrial site, comparing them to drinking water standards is not always appropriate because it's not a source of potable water. So there are provisions in various regulations to control contamination of groundwater, so essentially preventing spills and equipment failures to protect groundwater.

Once the groundwater is contaminated, we have a process in place to do technical assessments and to identify mitigation measures. That is essentially the process that took place on the various CNSC sites where contamination was found. In some cases, the situation is monitored. In other cases, as we saw earlier this morning, there are reactive barriers and pump-and-treat systems that

are implemented depending on the severity of the issues.

**THE PRESIDENT:** Okay. Thanks.

Ms Velshi...?

**MEMBER VELSHI:** So this question is actually for staff and it's on the chemical fuel manufacturing where they talk about changing their internal dosimetry system from urinalysis to lung counting and that doses increased as a result. So this is page 39 of the CMD.

So if a new dosimetry method is being introduced, as part of your approval process, do you do a comparison of data, the old and the new methodology? I'm just thinking of, you know, over time when we are trying to compare numbers, how do you reconcile something that was done using, you know, bioassay and now it's lung counting and the numbers don't look the same?

**MS PURVIS:** Thank you for the question. Caroline Purvis, Director of the Radiation Protection Division.

So certainly the change in the internal dosimetry methods was a result of the spreadsheet errors that have been discussed here previously and one of the requirements following that event was to review the methods used to ascertain dose through intakes of uranium and when Cameco did their review they felt that the lung counting



method was a superior method to the urinalysis for the ascertainment of dose.

Clearly, those two methods are not the same. Urinalysis, obviously you are measuring urine samples and the concentration of uranium excreted from the body. The lung counting method, you are measuring the individual and the amount of uranium that resides in the lung as the result of an intake. So reconciling those two values, obviously we would not necessarily expect them to be the same. There is different accuracy and precision for those two different types of methods.

Certainly when my colleagues in the Radiation Health Sciences Division looked at the acceptability of the dosimetry methods, they would look at the technical basis documents and if you want further information on that I can invite one of my colleagues up.

So this is the first year that we are reporting the new information with the lung counting method and we will be monitoring that data moving forward to ensure that we can identify trends in the coming years.

In particular it is important to note that the lung counting method is more conservative and that we would expect to see a higher dose. The method is significantly different than the urinalysis method.

**MEMBER VELSHI:** We heard earlier from GE

with their environmental gamma monitoring and that with this, your new method, the numbers are higher. Is that normally the trend, that as you get through more sophisticated, more accurate methods, the numbers tend to be higher?

**MR. RINKER:** Mike Rinker for the record.

So in the GE example, what I understand is the first method did not provide a difference amongst backgrounds, so its contribution was considered zero. And then the next method was more sensitive, it measured much lower numbers and so it actually had a contribution. So it did not measure something that was higher, it measured something lower, but its contribution was non-zero. So it's not exactly a --

**MEMBER VELSHI:** I'm sorry, I had misunderstood that from GE. I thought they were actually measuring greater delta from background and that's why it was now being added to public dose.

**MR. RINKER:** I will ask Paul Desiri to clarify.

**MR. DESIRI:** For the record, Paul Desiri.

So the method that we used prior to 2014 was using portable gamma survey instruments measured on a quarterly basis and the readings as compared to background at the perimeter were zero. The new method is an

integration over a period of a quarter, so the instrument is in place for the whole quarter. So it's collecting information for the entire period and integrating, so it's more sensitive.

**MEMBER VELSHI:** And you don't take away background -- you don't make any allowances for that then?

**MR. DESIRI:** For the record, we report the net increase over background. So there is a background --

**MEMBER VELSHI:** So the numbers are higher then with the new method?

**MR. DESIRI:** For the record, Paul Desiri.

It's more a question of more sensitive to be able to measure below -- at background levels than the numbers being higher, I think.

**MEMBER VELSHI:** I mean I hear you. All I'm saying is -- so I think my understanding was correct, that as you get through more sensitive, more sophisticated methods the end result is that dose seems to be higher, and is that normally the case as you get into more sophisticated, sensitive methods of measurement?

--- Pause

**MR. RINKER:** I will ask Mike Jones. He is our Environmental Protection Specialist who has helped us with most of our files.

**MR. JONES:** Hi, Mike Jones, Environmental

Project Officer, for the record.

With respect to public dose at GE Hitachi Toronto, the way we previously had GE determine public dose was through the effluent monitoring, so the air emissions and the liquid effluent emissions, and the amount that they were recording through their monitoring of air and monitoring of water was then combined using the derived release limits to do a calculation of what the public dose was.

The big change that happened in 2014 was that, as a result of an inspection we had conducted, we requested that in addition to those two potential sources of public dose we wanted them to add gamma as part of the public dose calculation.

And the reason for that is because for any of these uranium processing facilities, unlike other nuclear facilities where there are like very high radiological emissions, there is very low levels that are being released to the environment. Therefore, gamma is actually more significant.

And the placement of the dosimeters along the perimeter is the method that we had been requesting other locations to use for monitoring of public dose, which does give a good reading.

**DR. THOMPSON:** Patsy Thompson for the

record.

Just to complete, essentially by having the monitoring in place over a long period you are integrating all the information, including any peaks, whereas the previous method of a one-time measurement per quarter, you may or may not record essentially information that would be of relevance in any other period of the quarter.

**THE PRESIDENT:** But just to put a bottom line to all of this, we are talking about tiny amounts with respect to the 1 mSv, are we not? So I just want to make sure that we don't get mesmerized by the technique here and forget about the health impact here. We have not -- we are not talking about significant health impacts, are we?

**DR. THOMPSON:** Patsy Thompson for the record.

We are not talking about any health impact. It is essentially making sure that all of the information is used to get a comprehensive value of what members of the public are potentially exposed to.

**THE PRESIDENT:** Okay.

**DR. THOMPSON:** But there is nowhere any significance in terms of potential health impacts.

**THE PRESIDENT:** Thank you.

Ms Velshi...?

Monsieur Harvey...?

**MEMBRE HARVEY :** Merci, Monsieur le  
Président.

On page 45 of your document -- it's about  
CFM surface water monitoring -- you mention:

"In 2014, Cameco collected surface  
water samples at..."

There's 20 locations. And:

"Uranium concentrations in all  
surface water samples collected ...  
met the interim Provincial Water  
Quality Objectives..."

And then you have a list of exceptions.  
That list represents 6 over 20 samples, so it's 30 percent.  
I would like to have the staff appreciation of that. Is it  
worse than the previous year? Because at the end, you're  
just saying:

"CNSC staff will continue to oversee  
Cameco's monitoring..."

So is this something that we should care  
about? It's 30 percent of the samples.

**MR. McALLISTER:** It's Andrew McAllister,  
Director of the Environmental Risk Assessment Division.

I will just hit some highlights and Dr.  
Lei here could add some details if needed.

As indicated, we evaluate the monitoring information on a regular basis and had noted these exceedances and the reasons that Cameco had provided. What's important to note though is that these exceedances seem to be sporadic in nature. There is no trend that is evident yet and so that's why we continue to examine the monitoring information. Largely outside of the fence line, in the main part of the creek, we don't have these exceedances.

And then lastly, like anything else, we will be continuing to examine this and we know that there is future relicensing when re-examination of risk will occur and that will help address any future concerns.

**MEMBER HARVEY:** So you haven't compared the results with the previous year?

**DR. LEI:** Shizhong Lei.

Compared to past years there's not much difference. As Andrew was saying, those numbers are sporadic. You have this high number at one sample but in the next one it drops again, so we don't see any pattern so far.

**THE PRESIDENT:** This is a general comment for improving.

When you start giving us data like that, you know, a map would be really useful. I have no idea

where that is. I don't know how it relates to the slope, to the contour. We need to have some real -- this is a general comment on other submissions -- where for us to understand the geology here, et cetera, a map is almost essential. Otherwise, I have no idea how it relates to the whole facility.

Monsieur Harvey...?

Monsieur Tolgyesi...?

**MEMBER TOLGYESI:** On page 2 of Canadian Nuclear Workers' Council they are saying that union representatives have access to CNSC inspectors. Could you describe how it works? Should a union rep request to meet the CNSC inspector prior to meeting him or he just goes up to him and talks to him? And do you invite union reps to assist the inspector when he is doing an inspection?

**MR. RINKER:** I will ask Rob Buhr, the Inspector for the Blind River Refinery, to give some examples of how these relationships occur.

**MR. BUHR:** Rob Buhr for the record.

So at the Blind River Refinery they actually don't have a union but what they have is worker representatives. So we often talk with them and they are part of various groups such as environmental health and safety committees and so on and so forth. And at those times we are doing interviews and they are free to be able



to speak their mind or let us know how they feel operations are going.

At the Port Hope Conversion Facility there is a union present there and often, prior to going on inspection, we will notify them that we are coming and if they have anything they would like -- if they would like us to set some time aside during that inspection to discuss any matters, we can do it and work it into our inspection plan.

**MEMBER HARVEY:** And my last one is did you have a --

**THE PRESIDENT:** Once again, do they? Do they take you up on this offer?

**MR. BUHR:** Rob Buhr for the record.

Yes. On different occasions they have brought these things -- they have asked to meet with us and we have gotten some information, but you have to be careful on how that's used because sometimes there is an angle associated with that information as well.

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

At our conversion facility in Cameco fuel manufacturing the union representatives are invited to attend the meetings and are welcome to accompany the CNSC inspectors during inspections at those facilities that are

unionized.

**THE PRESIDENT:** Thank you.

Monsieur Tolgyesi...?

**MR. WARD:** Mark Ward for the record.

I can state as well that union representation is present at the Peterborough and Toronto facility. They are aware of the audits and they participate in them and we encourage that.

**MEMBER HARVEY:** And did CNSC receive a specific request of union reps to meet for some specific reasons?

**MR. BUHR:** Rob Buhr for the record.

Sometimes there are things associated with maybe concerns over work activities maybe related to conventional health and safety aspects but rarely anything to do with like radiation protection aspects or, you know, complaints about maybe dishonesty with respect to environmental monitoring and those types of results.

**MEMBER TOLGYESI:** My question was more if it's a high number of these requests or they are not just a subject.

**DR. NEWLAND:** Dave Newland for the record.

Across the CNSC I would say that it is relatively rare that such requests are made but they are made in exceptional circumstances.

**THE PRESIDENT:** Dr. McEwan...?

**MEMBER MCEWAN:** Thank you, Mr. President.  
I have a couple of questions related to data.

Slide 18 of staff presentation. In 2014, in 2012 and in 2011 there is no data point for Cameco fuel manufacturing. Does that mean the value is zero, zero, the data were not provided or the data were not available?

**MR. RINKER:** Mike Rinker for the record.  
There is a footnote to that slide. Like all environmental monitoring, the period, like the frequency of monitoring and the scope of monitoring is risk-based. In this case soil monitoring is every three years.

**MEMBER MCEWAN:** So to stay with the Cameco fuel manufacturing, on page 43 you describe again the recalculation of a sanitary sewer release into the total calculation. So this is presumably a nontrivial process failure on the part of Cameco in terms of doing that calculation. Can you help me understand then? When you come to the ratings for environmental protection, they have been satisfactory in all five years. At what stage does a major process failure like that become below expectation?  
--- Pause

**MR. RINKER:** Mike Rinker for the record.

So we have the project officer as well as the environmental protection specialist to help answer. So perhaps we could first put in the context of the magnitude of the error and then we will follow up what it means in terms of rating.

--- Pause

**MR. JONES:** Hello. Mike Jones, Environmental Program Officer, for the record.

With respect to the CFM identification of errors in the reporting of uranium releases to the sewer, essentially they were not including the groundwater in their calculations. So while the measured concentration of uranium being released was accurate, the total volume was incorrect. Therefore, the loading was incorrect.

As for the difference between the originally reported values and the new, it varies between year to year because this was over 2007 to current day. From what I saw, I believe it ranged from -- the new values are between two and three times higher than what was previously reported. That being said, overall the releases to the sewer were -- are still -- even after the recalculation are extremely low. So the corrected values remain less than 0.5 percent of the licence limit. So it's -- the value may need to be corrected but the impact is still extremely low.

With respect to whether or not this would impact the rating of environmental protection to build from satisfactory to something below, because the impact as a result of this identify issue was extremely low, like I said, the results are still below 0.5 percent of the derived release limit, it wasn't considered significant enough to devalue the overall rating for all the environmental issue program of that facility.

**MEMBER MCEWAN:** So if I argued to you that what is important is actually not the magnitude of the impact but the magnitude of the process failure, because the process failure it is by -- I don't know if by chance, good management, whatever, that the magnitude of the error was small, would it not be the magnitude of the process failure that would define your rating?

**MS RIENDEAU:** Nathalie Riendeau, for the record.

CNSC staff following this report this year and also following on the previous report with the calculation error on the urine analysis in 2013, we conducted a Type I inspection of management system at CAMECO fuel manufacturing and we requested some improvement as an output from that inspection on independent verification.

So this year as we indicated in our

presentation, Cameco Fuel Manufacturing undertook a review of their regulatory results focusing specifically on method and controls and independent verification. They identify -- essentially they prioritized their review. This was a lengthy exercise but it was done carefully and also incorporating lessons learned from the other site.

So we see this here at the CNSC. We look at this in terms of not specifically environmental performance or radiation protection performance but we're looking at our licensee, in this case Cameco Fuel Manufacturing, to look at their process and to ensure that the verification is robust and ensure that the data that we present to you is accurate.

In terms of the rating, when we assign a rating to a licensee in our 14 Safety and Control Areas, we looked at their performance of their -- like the program they established and the performance if it's an aggregate. So in that sense based on the safety significance and the performance of the program, as an aggregate, we assign the rating.

**THE PRESIDENT:** Can I ask a simple question on this? Should CNSC staff have detected this? This has been running since 2007. So is it reasonable to have expected CNSC staff to detect this and if we had this independent environmental measurement would that have been

detected?

**MR. RINKER:** Mike Rinker, for the record.

For the first part, and then I'll pass it to our Environmental Protection Specialist, this is not the first time we have been describing to the Commission errors in reportable data. So in general we are working to find additional ways to verify that the data that we receive and report to you is accurate.

In this case while the environmental effects or the risks to the public were not significant, the fact that there was an error in what was reported to us over years we consider as significant enough to put it as an action for our own improvement to have a reactive Type 1 inspection and to be reporting this to you today. So we do see it as an important issue and an area for improvement for CNSC staff to make not just with Cameco's facilities but across the processing facilities.

As to whether the Independent Environmental and Monitoring Program could have detected that I will ask Mike Jones to please respond to that.

**MR. JONES:** Mike Jones, Environmental Project Officer, for the record.

The Independent Environmental and Monitoring Program occurs outside of the facility perimeter, so that program itself would not have detected

any issue like that. If we were to take sampling during an inspection, which we sometimes do, that sample would have given us information on the concentration at the time the sample was collected. But since the issue was related to the related to the amount of water that was being discharged to the sewer, that information by itself would not have been enough to detect that kind of an issue.

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

I wanted to emphasize both with this and the previous issue on the dose calculation at CFM, those were self-identified by Cameco. The liquid effluents sewer issue was identified during an internal audit and steps were taken immediately to remedy that situation.

The follow-up inspection that CNSC staff have referred to led to that agreement to have that annual verification process for regulatory data calculations at all of our sites prior to the issue of the Annual Compliance and Operational Performance Report.

The verification process that will be put in place is intended to be documented as well.

**THE PRESIDENT:** Ms Thompson...?

**DR. THOMPSON:** Perhaps -- Patsy Thompson for the record -- if I could add, the CNSC regulations require effluent monitoring programs as well as an



environmental management system. Those programs are generally quite mature in licensees such as Cameco and nuclear power plants. So we have over time decreased our frequency of Type I inspections or audits to have more routine inspections.

One of the lessons learned from these types of events and essentially calculation errors that have been reported for other types of programs is that when there are changes to facility operations or types of discharges that we should essentially change our compliance programs to have a more systemic look at the environmental management systems in such programs to make sure that the changes that are occurring are captured appropriately in the licensee's programs.

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

Dr. McEwen...?

**MEMBER MCEWEN:** I'm done, thank you.

**MEMBER VELSHI:** Why don't we take a break and then come back?

**MEMBER MCEWEN:** And then come back.

**THE PRESIDENT:** Okay. I think we are going to take a break for -- a quarter to 12:00, according to this clock. We will come back at a quarter to 12:00.

--- Upon recessing at 11:33 p.m. /

Suspension à 11 h 33

--- Upon resuming at 11:46 p.m. /

Reprise à 11 h 46

**THE PRESIDENT:** Okay. We are back and I think we have one last round of questions. So let me jump right into it. So Ms Velshi...?

**MEMBER VELSHI:** Thank you, Mr. President.

So staff, I was really happy to hear that you are looking at this whole issue of errors in reportable data in a more global way and I would suggest that you expand the scope to not just errors. I mean given the recent Volkswagen incident that -- I am not suggesting any of our licensees report data deliberately wrong, but that we actually as regulators look and see how do we make sure that we are on top of our game? And I'm sure as Commission members we look forward to hearing what you are going to be doing about that.

My question, and this is what we asked when the nuclear power plants report was presented to us, is the number of interveners and submissions that we got this time. You know, we got a couple of them. Is that satisfactory? Is that sufficient feedback? I mean, you know, just think of our time at GE Hitachi and the level of

public engagement that was evident then.

Is there more that should be done to hear more from our other stakeholders on how these facilities are doing, and staff's assessment of them?

**MR. RINKER:** Mike Rinker, for the record.

So a general comment about GE in particular in Toronto, last April the CNSC did conduct a CNSC 101 in the neighbourhood and we tried many avenues to engage the public and encourage an audience. For the most part, I think, it was the community liaison committee only who attended.

So 2013 may have been more symptomatic of activists moving into the neighbourhood than the general population. I am not going to dismiss the fact that there may be concerns out there that we are not aware of, but we didn't see a repeat even though we tried to engage.

In general, I think the performance was reasonably satisfactory in 2014. We have some issues that we are following up with, but I didn't -- we were not aware of any major concerns throughout the year that the public had significant preoccupations with.

However, being in communities is helpful to engage the public when they just have something good to say or just want information. They may be more inclined to participate than by coming to Ottawa.

**MEMBER VELSHI:** Thank you.

**THE PRESIDENT:** Monsieur Harvey...?

**MEMBER HARVEY:** Just one question, a quick one.

Page 7 on your document there is a table there on the oversight licensing and compliance activities for uranium processing. As the evaluation is based on a risk-based evaluation -- so looking at that table can we say that by the efforts given by the staff that like, for example, Port Hope Conversion Facility which will require person days of compliance of 516, compared to Cameco Fuel, 172; can we say that one is more risky than the other one? I mean is it a picture that can indicate the risk of those facilities?

**MR. RINKER:** Mike Rinker.

So our Compliance and Oversight Program is risk-informed, so we are informed by previous performance; we are informed by events and we are informed by the risk profile of the facility.

In general the Conversion Facility, for example, deals with hazardous chemicals that are very important for safety to be managed correctly. It's a much bigger, more complicated process where it uses electricity to separate out hydrofluoric acid into hydrogen gas and fluorine gas. So there is a lot of complex processes that

happen at this facility.

In addition, the performance in 2014, there were a number of events that occurred and we were on site perhaps observing. So the inspections are six but we were on site more than six times to observe, to make sure that corrective actions were being performed.

So in general, I think, for 2014 you could say that the risk information that we have is commensurate with the number of days we have put forward in terms of compliance.

**MEMBER HARVEY:** But can we say that in the coming year, for example, you will give the same order of efforts for the same facility?

**MR. RINKER:** Mike Rinker.

So the Conversion Facility will always be more effort than the other facilities simply because it's more complex and the potential hazards associated with that facility are much higher than, for example, a fuel manufacturing facility that receives uranium powder and makes pellets and puts them in bundles in a physical process. However, the number of days may go down because in 2015 we are not seeing the same trend of events that we saw in 2014. So the performance of the facility in terms of reportable events has certainly improved. So our reactive inspections, our reactive compliance based on

events has -- so far has been lower.

**MEMBER HARVEY:** So the performance of the facility as a role to play in the efforts that you will give next year to that facility?

**MR. RINKER:** Mike Rinker.

That's correct. So risk-informed includes the nature of the facility as well as the performance of that facility.

**MEMBER HARVEY:** Merci. Okay.

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

One other piece in addition to the -- or I guess an added consideration in the complexity of the Conversion Facility is that it has two operating plants producing two different end products. So you have a UF6 production as well as UO2 production.

So with all of the other points that Mr. Rinker made, there is the additional consideration that you have -- essentially you have two production lines at that facility.

**THE PRESIDENT:** Thank you.

Mr. Tolgyesi...?

**MEMBER TOLGYESI:** I don't have a question. I have just a comment that in spite of our comments and the request to improve the annual report we note that this

year's annual report is an improvement compared to last year's. So you deserve -- you have a merit for doing that and I am quite sure that the next year there will be kind of continuous improvement.

That's it.

**THE PRESIDENT:** I will echo that. I think that I find the reports are, you know, a lot useful and our job is to make sure that they continue to improve and find any kind of areas where we can suggest improvement.

So Dr. McEwen...?

**MEMBER MCEWAN:** Thank you, Mr. President. I would echo that too. It's much easier to read than last year.

Page 19, just a very, very, very specific question relating to this misplaced dosimeter. I would like to understand what the process is when a dosimeter is misplaced.

So was the individual worker for the period of the lost dosimeter un-badged? Was he badged with a replacement dosimeter? And how long did it take before he noticed he lost his dosimeter till the time it was either found or he was re-badged?

**MR. RINKER:** If we could have Cameco help us with that reply while we search for the information?

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

record.

We similarly don't have that information in front of us and would have to do some digging to get it. We can commit to coming back or providing that information to staff for transmittal to the Commission.

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

**MEMBER MCEWAN:** Thank you.

**THE PRESIDENT:** Any other questions?

I just have one and, again, it's very, very specific and it's probably because I didn't understand.

This is on -- let me find the location. This is on page 57 and it's dealing with GE Hitachi. The last, almost, paragraph says:

"GE Hitachi conducted a total of 40 inspections and investigations in Toronto and 65 in Peterborough."

That sounds like a lot, and the question is are they really serious kind of full inspections and are the results shared with CNSC staff?

**MR. WARD:** Mark Ward, for the record. I'll make a first comment and then I'll pass it over to Paul Desiri.

We do a number of internal inspections throughout the process just on our own due diligence and



for continuous improvement to optimize processes, but I will let -- I will let Paul comment on the information that may be shared with the CNSC staff.

**MR. DESIRI:** For the record, Paul Desiri.

It really depends on what we are investigating. So for instance, if it's an action level exceedance we have an obligation to report to the CNSC within 24 hours and submit a report within 21 days which we do.

If it's an internal level that has been exceeded, we normally investigate ourselves. We take -- we do just as thorough an investigation as if it was an action level but we don't normally share that information with the CNSC. But they are certainly welcome to look at it when they are doing inspections especially if they are looking at that subject area.

So, for example, if they are looking at radiation protection often what they do is they look at all the internal level exceedances over a period and sort of what was investigated, and what was the lessons learned.

**MR. WARD:** Mark Ward, for the record.

I'll just comment again.

We have a very comprehensive software that we use called Gensuite that tracks all of our investigations, be it if they are related to issues related

to the licence or just industrial safety issues and responses. So that collects everything and they would have been put forward. That could be part of the reason why you are seeing a number of inspections here. They may not all be related directly to the licence activities.

**THE PRESIDENT:** Staff, are you making use of -- those are large numbers of inspections. Presumably there is some good material in there to verify what you are looking for.

**MR. AMALRAJ:** Julian Amalraj, for the record. I am the project officer looking after GE's compliance verification activities.

The inspections and investigation in question are associated with walkabouts related to worker health and safety that their committee is in charge of. This is something that GE does on a regular basis but they are -- the information is reviewed by their worker health and safety committee and the minutes from that worker health and safety committee is given to CNSC as part of inspections when requested.

CNSC staff did review the inspection -- as part of our inspection the worker health and safety committee minutes, and based on the performance we do take actions in terms of what we look at in the facility.

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

Anybody else; any other questions?

Okay. Thank you. Thank you very much. This will conclude the first part, and I think we can now move on to the second part of this report.

Dr. Newland, I think the floor is still yours.

**DR. NEWLAND:** Thank you. I will pass it over to Rob.

**MR. DWYER:** Thank you, and good morning, Mr. Chairman and Commission Members.

My name is Robert Dwyer and I am a project officer in the Nuclear Processing Facilities Division. I will be presenting the next part of the CNSC staff's presentation on the performance of nuclear substance processing facilities.

These facilities are different from the uranium processing facilities that we just discussed as their end products are not related to the nuclear fuel cycle for nuclear power plants.

The products created by nuclear substance processing facilities have a variety of end uses, such as diagnosing and treating cancer, sterilizing items for sanitary reasons such as surgical gloves, and creating self-luminous emergency and exit signs for buildings and aircrafts.

There are three nuclear substance processing facilities in Canada, all of which are located in the Province of Ontario. SRB Technologies is a gas tritium light source manufacturing facility located in Pembroke. Nordion is a health science organization that provides products used in the prevention, diagnosis and treatment of disease, and Best Theratronics manufactures teletherapy machines, self-shielded irradiators and small cyclotrons.

I think my mic must've cut out. Sorry.

Both Nordion and Best Theratronics are located in Ottawa.

The CNSC continuously monitors these facilities to provide assurance to Canadians of the continuing compliance and safety performance. This table presents the licensing and compliance effort from CNSC staff for nuclear substance processing facilities in 2014.

CNSC staff spent a total of 454 person days on licensing activities. All three facilities have undergone licence renewals in the 2014 and 2015 calendar years. A total of 278 person days were dedicated to compliance activities which include inspection of these facilities, licensees' activities and processes as well as through the review of licensees' reports.

CNSC staff performed a total of five

compliance inspections. All the findings resulting from these inspections were provided to the licensee in detailed inspection reports. There was only one enforcement action issued in 2014.

It should be noted here that Best Theratronics received their first Class 1B facility licence in July of 2014 and the inspection that was conducted was under its previous nuclear substance and radiation device licence.

All these facilities -- I'm sorry. At these facilities, there were no requests for information pursuant to Section 12(2) of the general *Nuclear Safety and Control Regulations* and no orders were issued. However, there was one administrative monetary penalty issued to Nordion for failing to comply with the condition of its export licence.

Nordion paid the penalty in nine days, and there have been no non-conformances of this nature since the issuance of the AMP.

The performance ratings for each of the 14 safety and control areas were determined by CNSC staff based on the results and observations from inspections and desktop reviews. For 2014, all of the nuclear substance processing facilities met CNSC staff's requirements and received a fully satisfactory rating, with the exception of

a few SCAs that were given a fully satisfactory for exceeding staff's expectations.

SRB's conventional health and safety program was rated as fully satisfactory in 2014 as a result of its consistent record of worker protection. CNSC staff also rated SRB's fitness for service program as fully satisfactory as a result of several improvements to its manufacturing processes, equipment and revision of its maintenance program in 2014. These improvements proactively incorporated best industry practice.

Nordion received a fully satisfactory rating for environmental protection due to its continual small environmental releases and Nordion's commitment to the "as low as reasonably achievable" principle.

Nordion's security program was also rated as fully satisfactory due to its continual improvements and ability to maintain the program.

Overall, these ratings indicate adequate management of safety and control measures at all facilities.

The graph on this slide shows the average and maximum effective radiation doses to nuclear energy workers for 2014 for the three facilities. The red line is the regulatory annual effective dose limit of 50 millisieverts.

As shown, the average and maximum doses received by workers at each of these facilities was well below the regulatory limit. This data demonstrates that doses to workers at nuclear processing facilities are safe and the radiation programs are effective.

This slide shows the number of lost time injuries for the last five years.

In 2014, there were no lost time injuries at SRB Technologies, three at Nordion and one at Best Theratronics. As previously mentioned, SRB was given a fully satisfactory rating in recognition of its consistent record for worker protection.

Nordion's performance rating for conventional health and safety was lowered from fully satisfactory to satisfactory for 2014 due to the increase in the number of lost time injuries.

Best Theratronics was issued its first Class 1B licence in July of 2014 and was not required to submit lost time injury statistics under its old licence.

CNSC staff conclude that the nuclear substance processing facility's licensees programs related to conventional health and safety were effective in protecting persons working at these facilities.

We'll now look at the three nuclear substance processing facilities in more detail, starting

with SRB technologies.

SRB processes tritium gas to produce gaseous tritium light sources and also manufacture radiation devices that contain these sources. This facility is located in Pembroke, Ontario.

On this slide are pictures of some of the items that are made at SRB, including exit signs, aircraft signs and safety markers. In 2014, there were no significant process modifications to SRB's facility.

SRB's licence was renewed on July 1st, 2015 for a period of seven years, with an updated Licence Conditions Handbook.

In 2014, SRB did not exceed any regulatory limits. There were no radiation protection action level exceedances, and one environmental action level exceedance.

The action level exceedance was a release of 16.57 terabecquerels of tritium which occurred from October 28th to November 4th in 2014. This release was above the weekly action level of 7.75 terabecquerels, and represents 3.7 percent of the annual release limit.

SRB conducted an investigation into this exceedance to identify contributing causes and root causes. SRB's investigation concluded that this exceedance was related to a gaseous tritium light source leakage and a manifold gauge leak.



CNSC staff reviewed SRB's investigation report and their proposed corrective actions and found both to be acceptable.

In 2014, there were no lost time injuries at SRB. CNSC staff are satisfied that SRB Technologies continues to protect the health and safety of workers and the environment.

During SRB's licence renewal hearing on May 14th, 2015, the Commission had two requests of CNSC staff. One was to present annually on the total quantity of tritium processed at SRB, including the number of products shipped and the number of expired signs received. The other was to provide annual information on tritium concentrations in ground water.

These next two slides are intended to provide the Commission with an update on this requested information.

In 2014, SRB processed a total of 28,714,118 gigabecquerels of tritium. There were 1,100 shipments of products that contained gaseous tritium light sources, and 20,363 expired signs received in 2014.

The expired signs were either reused or repackaged, secured and sent to a licensed waste management facility.

This figure provides the most recent

average ground water monitoring data near the SRB facility. As expected, the highest tritium levels in ground water occur adjacent to the facility, and very low values are observed near residential areas and in Muskrat River.

The concentration pattern observed in this slide is reflective of aerial deposition rather than ground water migration. As it rains, the tritium in the air is transferred into the ground water and decays before it is able to travel very far. This means that the values in Muskrat River are not expected to increase from what is observed today.

The elevated tritium levels surrounding the facility are from historic emissions and are expected to reduce over time.

Tritium values in wells located in the residential area are near or below the 200 becquerels per litre, which are well below the provincial drinking water standard of 7,000 becquerels per litre.

The residents are connected to the municipal water supply, which is fed from the Ottawa River where tritium is near the detectable limit of five becquerels per litre.

The observed concentration pattern is consistent with predicted values, and CNSC staff conclude that residents in the area and Muskrat River remain

protected.

This concludes the section on SRB Technologies, and I'll now move on to Nordion.

Nordion Canada Incorporated is a nuclear substance processing facility located in Ottawa, Ontario. Nordion manufactures sealed radiation sources used in cancer therapy and irradiation technologies and a variety of medical isotopes used in nuclear medicine.

The satellite photo on the right-hand side of this slide shows both the Nordion and Best Theratronics facilities as they're located directly adjacent to one another. Nordion's facility is highlighted with a red box.

In July of 2014, Nordion was acquired by a company called Steragenics. Nordion still operates under the same name, however, its Class 1B nuclear substance operating licence was transferred to reflect Nordion's new corporate identity. The only change on CNSC staff's licence was the new corporate number.

A hearing was held on August 19th, 2015 for the Commission to consider Nordion's licence for renewal. Just yesterday, the Commission's decision was published and Nordion was granted a 10-year licence expiring in 2025.

There have been no major changes to Nordion's facility or its operation since the recent public

hearings.

In 2014, Nordion had no regulatory limit or action level exceedances. Nordion did have three lost time injuries in 2014 that were all related to back injuries.

Nordion has since updated its back safety training and have planned additional initiatives on back safety in 2015. CNSC find the actions taken by Nordion to be acceptable.

CNSC staff are satisfied that Nordion continues to protect the health and safety of workers and the environment.

The following two slides provide a status update on the recent fire at Nordion. As discussed during Nordion's licence renewal, on August 6th, 2015 there was a fire on the roof of Nordion's facility. Nordion implemented its emergency response plan, and was in direct contact with the CNSC project officer once emergency measures were initiated.

Ottawa Fire Services were quickly on scene and extinguished the fire. There was no impact to persons or the environment, and no one was injured.

Both the air and water samples that were collected confirm that no nuclear substances were released by this event.

Nordion ensured that buildings -- the building was safe to enter and all ventilation and safety systems, including radiation protection monitoring equipment, security and fire protection systems were checked to ensure they were functioning and performing as required prior to recommending operations.

Nordion provided the CNSC with its 21-day report which identified that contributing factors were combustible materials that were located in the roof of the building, there was torch work taking place as a result of the roof repair work and the building's ventilation system was designed to be under negative pressure to ensure that radio nuclides stay within the facility.

This negative pressure may have contributed to pulling smoke into the building.

Nordion has committed to provide a final report which will include an assessment of the recommendations made by a third party by the end of October 2015.

This concludes the section on Nordion, and I'll now move on to Best Theratronics.

Best Theratronics Limited is a nuclear substance processing facility that's also located in Ottawa, Ontario and, as mentioned, it's directly adjacent to the Nordion facility. The satellite photo on this slide

is the same one that was presented for Nordion; however, now, Best is highlighted with a red box.

Best Theratronics was issued its first Class 1B licence, which included a new Licence Conditions Handbook, in July of 2014. At the time of the hearing, Best Theratronics had not established a financial guarantee for the future decommissioning of the facility. Consequently, the Commission required Best to provide a financial guarantee in a form acceptable to the Commission by January 31st, 2015.

On January 30th, the Commission amended Best Theratronic's licence to extend this date to April 30th, 2015.

Following a hearing in March, the Commission accepted the amendment to the financial guarantee and the schedule for funding it as proposed by Best Theratronics.

As per the funding schedule, the first installment of \$1 million was due in July of 2015. As of August 1st, CNSC had not received this installment.

On August 24th, CNSC staff issued an order to Best Theratronics for being non-compliant with its financial guarantee licence condition. The order required Best Theratronics to divest of radioactive sources to minimize the liability associated with future

decommissioning of the facility.

Best requested an opportunity to be heard by the Commission that was held on September 10th to discuss proposed amendments to the order. On September 18th, the Commission requested details regarding Best Theratronic's plan to comply with the order.

Best provided this information and a decision was made on September 28th to amend the order. The amendments clarify that Best must reduce its inventory of prescribed equipment sources and depleted uranium at its facility located at 413 March Road and to adjust deadlines on the order in accordance with Best Theratronics' request.

CNSC staff will provide regulatory oversight to ensure compliance with the order, and future regulatory activities may be required to ensure Best regains compliance with its licence.

In 2014, Best Theratronics had no regulatory limit or action level exceedances. Best did have one lost time energy where an employee sustained a cut to their hand as a result of the tool slipping during use. As a corrective action, Best provided additional practical training to employees to ensure that persons working with power tools were doing so safely.

CNSC staff are satisfied that Best Theratronics continues to protect the health and safety of

workers and the environment.

This concludes the section on Best Theratronics. I'll now turn the presentation back to Mr. David Newland.

**DR. NEWLAND:** Dave Newland, for the record.

In conclusion, CNSC staff compliance activities during 2014 confirm that the uranium and nuclear substance processing facilities, all 14 safety and control areas were rated as satisfactory or better. Radiation protection programs adequately controlled radiation exposures, keeping doses as low as reasonably achievable. Environmental protection programs were effective in protecting the environment, and conventional health and safety programs continue to protect workers.

CNSC staff conclude that in 2014, each facility operated safely and met performance expectations with respect to the health, safety of persons and for the protection of the environment and to Canada's international obligations.

That completes staff's second part of the presentation. Thank you.

**THE PRESIDENT:** Thank you.

Before getting into a question period, I'd like to hear from the licensees, starting with SRB



Technology. I understand Mr. Levesque will have some comments.

**MR. LEVESQUE:** Stephane Levesque, for the record.

Basically, we've reviewed the report that CNSC staff and concur with it, and if the Commission has members -- has questions to ask us, I'm available for questions supported by our Vice-President, Ross Fitzpatrick, and our manager of health and physics, Jamie MacDonald.

**THE PRESIDENT:** Thank you.

Any comment from Nordion?

**MR. BEEKMANS:** Rick Beekmans, for the record.

First of all, good morning, Mr. Binder and the rest of the Commission, and to the CNSC staff.

We're in support of the report that was put forward by the staff and myself and members of the ESH team from Nordion are available this morning to answer your questions.

**THE PRESIDENT:** Thank you.

Any comment from Best Theratronics?

**MS MASON:** Samantha Mason from Best Theratronics, for the record.

We are also in agreement with the CNSC's

report for the past year, and are expecting a few questions directed our way which we will answer to the best of our capability. Thank you.

**THE PRESIDENT:** Thank you.

Okay. So let's start the question session with M Velshi.

**MEMBER VELSHI:** I have a question for Best Theratronics around their lost time injury on slide 45. And the first part of the question is to staff.

You mentioned that under its previous licence under nuclear substance and radiation devices it was not required to report lost time injuries. I'm surprised to hear that. Or should I say it's a question for when that group is here?

**MR. RINKER:** Mike Rinker, for the record.

I think maybe we can come -- we can join during that presentation and if questions come, we can come up to the mic and help answer those questions.

**MEMBER VELSHI:** Thank you.

The second part of the question is on page 115 of the CMD, or Appendix G. There are no details provided on the lost time injury at Best Theratronics whereas we do have it for all the other facilities.

**MR. RINKER:** Mike Rinker, for the record.

As we were preparing for today, we did

notice that in advance. We provided it in our speaker's notes, but with the Commission's permission, we'll update the report on final publication with that information.

**MEMBER VELSHI:** Thank you.

And what was the severity of that lost time injury?

**THE PRESIDENT:** Maybe we can hear from BTL?

**MS MASON:** Yeah. Samantha Mason, for BTL.

The -- it was an injury from a machine shop activity. The severity, he had to go to the clinic just to get a couple of stitches. It wasn't -- I'm not sure how severe you would describe that.

**MEMBER VELSHI:** I meant how many days off work.

**MS MASON:** It was six days off.

**MEMBER VELSHI:** Thank you.

**THE PRESIDENT:** Thank you.

Monsieur Harvey?

**MEMBER HARVEY:** Just a comment. It's on the slide 52.

We do appreciate that such a map about the concentration in ground water and maybe a good thing would be to just indicate on the graph the trend, if it's going up or going down. So I think it would help.

That's on page 52 on the overhead slide.

**MR. RINKER:** Right. Mike Rinker, for the record.

So would you be looking for -- like in general over the last several years, the trends in all wells are on their way down, but I -- would you like to see in future reports evidence of that?

**MEMBER HARVEY:** No, it would be just a sign on the map like you do for some other evaluation to indicate the trends going down.

**THE PRESIDENT:** I think -- this is one of my favourite kind of subject, and I think you -- staff, in previous presentation, had the migration of the plume over time and you had some forecast and then you have some actuals. It would be nice to -- for you to include this, an update on an ongoing basis as to whether things are progressing according to forecast.

**MR. RINKER:** So Mike Rinker, for the record.

I think Dr. Lee is here to provide some additional information. However, I wanted to be clear that that model and the trending was conducted at relicensing in 2010, and it's -- the model loses effectiveness each year away from 2010.

So that's actual trending of ground water,

and the concentrations may be a bit more -- a better approach. However, I'll ask Dr. Lee if he has advice as well.

**DR. LEI:** Shizhong Lei, for the record.

The data in 2014 still had all the requirements for (indiscernible), still met very well with the prediction that CNSC staff conducted in 2014 based on historical records and data during that time. And in essence they are -- just like Mike just said, the groundwater at all the monitoring wells are still stabilizing and in a down trend.

**THE PRESIDENT:** But that's the graph we would like to see: over time how it goes down, as -- you know, as we expect it to go down, as you forecast it'll go down.

Monsieur Harvey.

**MEMBER HARVEY:** It's okay.

**THE PRESIDENT:** Thank you.

Mr. Tolgyesi.

**MEMBER TOLGYESI:** Merci, monsieur le président.

On page 65, you are saying -- this is regarding SRB -- "approximately 20,363 expired signs." It's not "approximately," it's quite clear that it's 20,363 probably --

--- Laughter / Rires

**MEMBER TOLGYESI:** -- so we should just correct that.

On pages 69 and 70, you are talking about groundwater monitoring, "There are 46 wells, including 11 residential." I'm not sure, probably it will be useful if you have just a plan where you show all those wells to demonstrate to the general public that, you know, it's a strong commitment and strong measurement to control.

On page 70, in Figure 8.4, you are talking about one well which is no longer participating in sampling.

Are there other wells which were not participating, and what are the reasons to exclude them?

**MR. RINKER:** Mike Rinker, for the record.

So these wells are a part of SRB's environmental monitoring program, and I would like to have them answer the question on why that certain well was excluded.

**MR. LEVESQUE:** Stephane Levesque, for the record. Thank you for the question.

There was some construction at a distance from our facility that took place. There's two wells that had to be decommissioned that were monitored as there's actually something that's being built exactly in that area.

The other wells are no longer part of the program. They were members or citizens that no longer wanted their wells to be monitored.

**MEMBER TOLGYESI:** That's the willingness of the citizen, but to what extent there was some matter to monitor? I mean how material was there or how much contaminants were there? Because, you know, on one side, if somebody doesn't want to monitor, it's one thing. Another one is if there are contaminant, you have to do something about that.

So how do these two fit together?

**MR. RINKER:** So Mike Rinker, for the record, just to start.

There are a number of wells. Some of them are private, old residential wells, and some of them are installed monitoring wells. The program, as a whole, from a groundwater monitoring perspective, is acceptable. It's acceptable because we have an understanding of tritium behaviour.

We have a number of years of evidence that the tritium levels are going down and they're already well below the provincial drinking water standard, so that having a few wells drop off did not raise a concern for us.

**THE PRESIDENT:** Thank you.

Dr. McEwan.

**MEMBER MCEWAN:** Thank you, Mr. President.

So again just to comment, if you look at the graphs in this section, there is an order of magnitude difference almost between the levels and the regulatory limit. It would be helpful I think again just to reinforce the action level.

Again, if I look at the SRB discussion, talking about dose control for workers, you report maximum -- your average effective dose and maximum effective dose. There is no report and no indication in the text why there was no report for extremity or skin dose, and I think that there's a gap there that either needs filling at the one end or at the other end.

**MS PURVIS:** Caroline Purvis, the Director of the Radiation Protection Division.

So SRB has one radiological hazard that's presented for workers, and that's exposure to tritium. Certainly tritium essentially is exposed in such a way to the body that the effective dose is really the only area of concern.

**MEMBER MCEWAN:** So I think again, for the public reading this document, it needs explaining in the text why they're the only group for whom the extremity and the skin doses aren't reported.

**MS PURVIS:** Thank you, that's a...



--- Off microphone / Sans microphone

**MEMBER MCEWAN:** And my final question, again related to SRB, of the 20,000-odd returns, how many of those are actually delivered for disposal and how many are reprocessed?

**MR. LEVESQUE:** Stephane Levesque, for the record. Thank you for the question.

We don't keep track of the percentage of what we use, but we will surely do that in future, but I could tell you that it would be less than 10 percent that would be reused in new products.

**THE PRESIDENT:** And where you dispose of them, again, you mentioned in the report here that it's being disposed to "licensed facilities."

What I want to know is, staff, do you know who those licensed facilities are, and do you ever get to check to see if everything's okay over there?

**MR. RINKER:** It's Mike Rinker, for the record.

So our knowledge is that the CRL site at Chalk River, and I'm not sure if --

**THE PRESIDENT:** All of them going to Chalk River?

**MR. LEVESQUE:** Stephane Levesque, for the record.

Yes, they are, and we keep all the records available on file. We also report those transfers in our annual compliance report, which is posted on our website.

**THE PRESIDENT:** So if they all go to Chalk River, why isn't it mentioned it's going to Chalk River, why to a "licensed operator?"

**DR. NEWLAND:** We can make that adjustment for the future. Dave Newland, for the record.

**THE PRESIDENT:** Okay.

Ms Velshi.

--- Off microphone / Sans microphone

**THE PRESIDENT:** Mr. Tolgyesi.

No questions? Okay, I've got, I think, at least one here.

Can somebody explain to me, on page 109, the graphs, F4 and F5? What am I looking at here?

Actually, this is from the previous -- I'll take it back. I should have asked it last round.

To Best Theratronics, I don't know if you had a chance yet to review the modified order, so I don't know if I want to put you on the spot, but I will, so what do you think, are you okay with this amended order?

**MS MASON:** Yes, we have had a chance to review the amended order and we are very grateful with the amendments that have gone through. We're working with Mr.

Rinker, Mr. Rinker and several other members of the Commission, to make sure that we meet everything in there for you as soon as possible.

**THE PRESIDENT:** Thank you.

And I'd also like a little update -- and, again, I don't know the time, whether it's happening in 2014 -- from Nordion, our exporting and importing licence's process. So now everybody's happy with the new and improved process?

**MS KAVANAGH:** Jackie Kavanagh, for the record.

Yes, as CNSC staff had mentioned earlier, since the receipt of the imp, Nordion has been fully in compliance with the notification requirements. Immediately following receipt, we implemented additional verification and oversight of our manual process. We conducted an in-depth internal review. That was led by Nordion employees who had significant lean sigma and process improvement efforts.

They identified that the manual nature of our notification process had many opportunities for human error. So prior to implementing any additional changes, Nordion engaged a third-party expert in business improvement processes over a wide range of industries, and that review by the external experts concurred with

Nordion's conclusions. In addition, they identified some additional improvements that we could make.

Subsequently, Nordion moved forward with an electronic platform for our notifications to reduce the opportunity for human error to include an escalation process, improved monitoring and alert when notifications were coming due. We launched that electronic process last week, on September 23rd, and are moving forward with that.

In the past week, our notifications have been in compliance. We expect that going forward we will be able to remain in compliance with the notification requirements for our export licences.

**THE PRESIDENT:** Thank you.

Any other comments? SRB.

**MR. LEVESQUE:** Thank you very much for the opportunity to add this comment here.

Just to elaborate on a question that was asked earlier regarding the wells that we no longer monitor, and the associated level of risk, there's three residential wells that we no longer monitor. Bearing in mind that these wells continue to decrease in concentration over time, there's one well that was last monitored in 2011. The value of it was less than 4 percent in the Ontario drinking water guidelines at that time, and the other two wells, who we discontinued sampling in the last

year and a half, are just above detection level.

**THE PRESIDENT:** Go ahead.

**MR. RINKER:** Sorry, Mike Rinker, this is on another topic. There was a question about a dosimeter related to Blind River, and we did find the information, if the Commission's willing to hear their answer for that question.

**THE PRESIDENT:** Go ahead, please.

**MS DODKIN:** Christina Dodkin. I'm a radiation protection specialist, for the record.

Dr. McEwan, you had a question regarding the misplaced dosimeter.

So in May 2014, a worker's dosimeter did record whole body and skin doses that exceeded the corresponding action levels. An investigation was conducted by Cameco, as required. In interviews with the affected worker a number of procedural non-compliances were discovered, including the worker did recall dropping the dosimeter in a process area and not retrieving it, and then having it reappear sometime after, a week or so after, so presumably during that period the worker was not wearing dosimetry.

Cameco's corrective actions included coaching of the worker to reinforce the proper use and storage of dosimetry, and they expanded that to all workers

at the facility. In parallel to that, they did initiate the dose change requests, which was subsequently approved by the CNSC.

But in spite of that, the investigation results did concern CNSC staff and, as mentioned in the Regulatory Oversight Report, we did request Cameco to implement more proactive approaches at the Blind River refinery to ensure that they have adequate oversight to ensure that these non-conformances do not happen in the future and to limit their occurrences.

Further to that, we did ask them to benchmark their dosimetry handling practices with similar facilities. Cameco did do that, and they did submit their assessment, which is under review by CNSC staff currently.

We're going to look at those results and include them in our planned radiation protection inspection that's to occur this fiscal year. So this topic will be included, and we will be looking into the implementation of those corrective actions.

**MEMBER MCEWAN:** Thank you. So for the week when the worker wasn't badged, or the two weeks or the month, whatever it might be in an individual circumstance, presumably there is an assignment of a dose to that worker for that period. How is that calculated?

**MS DODKIN:** Christina Dodkin, for the

record.

So as part of Cameco's investigation, they did look at this worker's work activities for the month. They were able to derive a sufficient dose assessment for the worker based on his work activities, and also looking at similar workers that were doing similar job actions as well during the month.

That was reviewed by experts at the CNSC, and it was deemed acceptable, and a revised dose was submitted to the National Dose Registry.

So the official dose record was changed for that individual to remove the suspected non-personal dosette that was recorded on the dosimeter while it was lost, essentially, for one or two weeks in the facility.

**MEMBER MCEWAN:** So that's presumably where that value -- I think it was .19 that was eventually assigned to the dose registry -- comes from, that sort of comparative and calculated --

**MS. DODKIN:** Yes, I believe so.

**MEMBER MCEWAN:** So is there a way within either Cameco's system, CNSC's system or the dose registry of flagging this: that it is a calculated dose, and so -- an assigned dose, so if this were to happen four or five times to an individual worker, there'd be some sort of process to review that even more carefully?

**MS DODKIN:** Christina Dodkin, for the record.

I can speak as an RP specialist. So whenever there is an action level exceedance, we are tracking and monitoring that. We do follow through on the corrective actions by the licensee. So in this case there was a dosage request, so the resultant dose then dropped below an action level.

That said, there was still an investigation. It revealed a number of deficiencies that we do take seriously and do want to follow through.

**MEMBER MCEWAN:** That wasn't my question.

So if this individual worker in 2016 drops his badge for another week and there is an assigned dose, and then he drops his badge for another time in December of next year, is there a flag that would actually identify that this is an individual whose got three assigned doses because of this type of action?

**MS PURVIS:** Caroline Purvis, the Director at the Radiation Protection Division.

So the dose change request process is such that the licensee will submit the information to the CNSC. CNSC experts in the Radiation and Health Sciences Division will assess the information that's been provided.

If there's sufficient information to



assure us that the estimated dose has enough rigour and integrity to stand, a letter will be issued not only to the submitter, so the licensee, with copy to the NDR, but also a letter to the dosimetry service provider. It is the dosimetry service provider that will make the correction to the NDR.

So there is no flag. This will then become the official record in the National Dose Registry.

**MEMBER MCEWAN:** Okay, I still don't think my question's answered.

There's no way of identifying a serial loser of badges with serially assigned doses among real doses?

**MS PURVIS:** In the National Dose Registry? No. But certainly, from an oversight point of view, from the radiation safety point of view, if we had indications during inspections or other reporting information that there was a poor performer or a poor licensee in terms of conformance with procedural requirements, we would certainly be asking those questions, and identifying that through our baseline or reactive inspections.

**DR. NEWLAND:** Dave Newland, for the record.

**MR. MOONEY:** Sorry, I'm talking over you there. It's Liam Mooney, from Cameco.

The other piece to that, in addition to the rigour with which that dose change request is dealt with is the point around the investigation. It would be Cameco's investigation that would look at the individual employee in question. If the person had, which we don't see, previously had assigned dose from a similar incident, that would be flagged in the investigation. So we would look at that as -- if there's the potential extent or condition around that particular employee that requires further action.

**MEMBER MCEWAN:** Thank you.

Thank you.

**THE PRESIDENT:** Okay, I think that wraps up this particular part of the meeting.

Thank you all, and we will reconvene at --  
--- Off microphone / Sans microphone

**THE PRESIDENT:** Cameco, will you be available for 1:30?

**MR. MOONEY:** Yes.

**THE PRESIDENT:** Okay, we'll reconvene at 1:30.

Thank you.

--- Upon recessing at 12:45 p.m. /  
Suspension à 12 h 45

--- Upon resuming at 1:35 p.m. /  
Reprise à 13 h 35

**THE PRESIDENT:** We are back a bit late, so  
let's start.

**CMD 15-M35/15-M35.A**

**Oral presentation by CNSC staff**

**THE PRESIDENT:** The next item on the  
agenda is the Regulatory Oversight Report for Uranium Mines  
and Mills in Canada: 2014, as outlined in CMDs 15-M35 and  
15-M35.A.

The public was invited to comment in  
writing on this item. The Commission received two written  
submissions.

We have representatives from Cameco  
Corporation and AREVA Resources Canada Inc. joining us by  
videoconference from Saskatoon and available for questions.

Let's start by -- ah, a full room. Can  
you hear us back in Saskatoon?

**MS EATON:** Yes.

**THE PRESIDENT:** Good. Thank you.

So I will turn the floor to Dr. Newland to  
get us going.

**DR. NEWLAND:** Thank you.

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

With me today are Mr. Jean LeClair, Director of Uranium Mines and Mills Division, and Mr. Mark Langdon, Supervisor of the same Division.

We also have CNSC staff involved in this report here in Ottawa and by videoconference from the CNSC's Saskatoon office. We have the Uranium Mine and Mill Project Officers, licensee representatives from Cameco and AREVA, and provincial Government of Saskatchewan representatives from the Ministry of the Environment and the Ministry of Labour Relations and Workplace Safety.

We are here to present Commission Member Document CMD 15-M35, entitled Regulatory Oversight Report for Uranium Mines and Mills in Canada: 2014.

I will now pass the presentation over to Mr. Jean LeClair. Thank you.

**M. LeCLAIR :** Bonjour, Monsieur le Président et membres de la Commission. Mon nom est Jean LeClair. Je suis le directeur des Mines et Usines de concentration d'uranium.

For the benefit of those people who are

not bilingual, I will do my presentation in English. However, I am more than happy to answer any questions in either French or English.

Before we start with the presentation, I would like to note a couple of amendments to the Regulatory Oversight Report CMD 15-M35.

An amendment has been made on page 4 within Table 1-1. I will just give you a minute to find that. CNSC staff reported three action notices at McArthur River, which has been changed to two, resulting in a total of 32 action notices at all the facilities in 2014. This further resulted in a change to the number of enforcement actions from 34 to 33 in section 1.2 located above the table.

The second amendment is on page 9, Table 1-2. The concentration of molybdenum listed in the reference station -- so the reference station is the fourth column -- was changed from 1.32 to less than 1.5 µg/L.

The CNSC currently produces a number of regulatory oversight reports, as shown on this slide. Earlier this morning we heard with regard to the report on the uranium and nuclear substances processing facilities. This presentation and this report is on the uranium mines and mills.

The report highlights areas of licensee

performance assessed by CNSC staff for the 2014 calendar year, including licensee regulatory requirements and CNSC staff expectations, significant events and developments, and assessment of the licensee's overall performance. It also provides five-year trend data and performance comparisons to other mining sectors.

The report summarizes performance data on 14 safety and control areas, as shown on the right side of this slide. The report focuses on radiation protection, conventional health and safety, and environmental protection, as outlined in red.

Additions to this year's report include information on the CNSC's 2014 independent environmental monitoring program and requests for additional information by the Commission on the Key Lake calciner events and the lessons learned resulting from the Mount Polley tailings dam breach event in 2014.

The CNSC ensures compliance at uranium mines and mills through verification enforcement and reporting using risk-informed regulatory oversight in order to protect the health, safety and security of people and the environment, while respecting Canada's international commitments on the peaceful use of nuclear energy and to disseminate objectives, scientific, technical and regulatory information to the public.

In 2014, there were 29 inspections conducted at the five uranium mine and mill operating facilities. The estimated staff person-days or regulatory effort to plan, execute and conduct these inspections and report on them is displayed on this slide.

The 29 inspections resulted in a total of 58 enforcement actions, consisting of one directive, 32 action notices and 25 recommendations. No orders were issued at the uranium mines and mills facilities in 2014 as a result of enforcement activities. CNSC staff have reviewed, verified and accepted the licensee's responses and corrective actions. All 2014 enforcement actions are closed.

To complement existing and ongoing compliance activities, the CNSC implemented its independent environmental monitoring program to verify that the public and the environment around CNSC regulated nuclear facilities are safe. This verification is achieved through independent sampling and analysis by the CNSC.

In 2014, CNSC staff conducted water sampling at Cameco's Key Lake and McArthur River facilities as part of CNSC's independent environmental monitoring program. The current report and this presentation provide the results for the Key Lake sampling program.

The results of the water samples analyzed

at the CNSC Lab were consistent with Cameco Key Lake's environmental monitoring results and did not identify any new concerns. The results for both the Key Lake and McArthur River sampling program were posted on CNSC's website on September 18, 2015.

In 2014, CNSC staff conducted water sampling at four sampling stations at the Key Lake facility. Treated effluent flows into a drainage basin, as shown in this simplified diagram. Three water samples were taken in the downstream environment from a near-field station approximately 2.3 kilometres downstream of the Key Lake Mill treated effluent discharge, a mid-field station approximately 12.3 kilometres downstream and a far-field station approximately 21.5 kilometres downstream.

A reference station water sample was also taken, which is located upstream of the treated mill effluent, as displayed on this slide. The reference station would represent a location within the same surface water system that could not be impacted by discharges from the Key Lake facility.

The results from the CNSC Key Lake sampling program are presented in this slide. The first four columns present the results for the samples taken in the near-field, mid-field, far-field and the reference station. The three columns on the right provide references



and a point of comparison for the sampling results.

The guidelines for Canadian drinking water quality are concentration guidelines for the human consumption of water generally based on health criteria. The aesthetic objective concentrations, shown as AO, are not health-based values. These concentrations represent poor water taste or colour and other non-health-based criteria. Drinking water guideline levels are conservative as their calculation includes substantial safety margins. It is also important to note that the mine sites are in remote locations and, as a result, these locations are not a source of drinking water.

The Surface Water Quality Guidelines for the Protection of Aquatic Life are developed by the Canadian Council of Ministers of the Environment and applied to the protection of aquatic species. The values are generally always lower than the drinking water quality guidelines for human health as aquatic species are more sensitive biological receptors than humans. Aquatic life safety factors are applied to the lowest toxicity values to ensure that they are conservative.

The regional natural background levels were established by CNSC staff using 13 years of licensee's environmental monitoring values collected in the region. They represent the regional range in values obtained from

natural background water samples. The sample results, as presented in the first four columns, are consistent with the environmental monitoring results reported by Cameco and do not indicate any new concerns.

Of particular note is the result for molybdenum. You will note that the near-field result for molybdenum is actually lower than the mid-field result. In 2009, following regulatory action by the CNSC, Cameco implemented improvements to the water treatment facilities at Key Lake to reduce releases of molybdenum, amongst a few other contaminants. The near-field results are showing a measurable improvement in water quality and the mid-field results are expected to decrease further over time as the improvements in water quality move further downstream.

CNSC staff conclude that the results are acceptable and the mitigation measures that were put in place are effective and that the public and the environment continue to be protected.

The CNSC is committed to continuous improvement, taking into account lessons learned from both nuclear and non-nuclear events. The next few slides will focus on an update on the Key Lake calciner events as well as further discussion following the work that we have done with regard to the tailings pond dam breach at Mount Polley.

On January 14 and February 16, 2015, the Key Lake operation reported two events associated with unplanned releases of calcined yellowcake. The locations of the two events are shown on a schematic diagram on this slide, highlighted in yellow.

The January 14th event was located at the base of the calciner and the February 16th event was located on the exhaust duct at the top of the calciner. Cameco's root cause analysis identified that the primary cause of both events was mechanical failure.

As a result of the two events, a total of six workers received radiation doses that exceeded the weekly action level of 1 mSv. The maximum individual effective dose of the six workers was 1.8 mSv, well below the regulatory limit of 50 mSv per year.

CNSC staff conducted inspections immediately after each of the two Key Lake calciner events and later followed up with an additional compliance verification inspection of the events in July 2015. The two calciner events were reported to the Commission at public meetings on February 4th and as an event initial report on March 25th, 2015.

On March 11th, 2015, CNSC staff issued a request under subsection 12(2) of the *General Nuclear Safety and Control Regulations* to Cameco's Key Lake and

Rabbit Lake operations and to AREVA's McClean Lake operation to review their operations as to the design and operational features that help prevent an unplanned release of yellowcake, the equipment processes and procedures that help in monitoring and identifying any weakening of containment systems, and the radiation monitoring equipment and procedures that will quickly identify any unplanned releases of yellowcake into the work environment.

CNSC staff have reviewed and accepted the licensee's responses, lessons learned and corrective action plans to the 12(2) requests.

In response to the events and CNSC 12(2) requests, Cameco Key Lake adopted corrective actions, including training of workers for an increased awareness for timely reporting of radiological hazards; enhanced radiation protection monitoring to identify releases of yellowcake into the working environment.

For the calciner exhaust duct, inspection ports were added, as shown in the picture on the slide. Additional base and hanger structural supports were added and signage was posted to protect the exhaust duct from impacts.

In addition, the Key Lake calciner design improvements and lessons learned were also applied to the new calciner currently being constructed.

Cameco Rabbit Lake and AREVA McClean Lake operations provided satisfactory responses to CNSC's 12(2) requests. Their responses did not identify any significant deficiencies. However, they identified opportunities for improvement of their mitigation measures already in place, such as increasing inspection frequency, improving preventive maintenance, updating documentation and training materials and additional workplace monitoring.

In conclusion, CNSC staff are satisfied with the licensee's responses, corrective action plans and their implementation to date and will continue to verify their implementation as part of routine compliance activities.

On August 4th, 2014, a breach of Mount Polley's operating above ground tailings facility released approximately 10 million cubic metres of water and 13.8 million cubic metres of tailing slurry into the environment. Follow-up investigation concluded that a silty clay layer within glacial till under the tailings dam provided a slide failure surface as increased weight from water and tailings were applied, resulting in dam failure. It is important to note that this is not a facility regulated by the CNSC.

This update is focused on above ground tailings management facilities that are operating uranium

mines and mills. A complete review of the lessons learned from the Mount Polley event for all above ground tailings management facilities, including at both operating and decommissioned uranium mines and mills, will be presented to the Commission later this fiscal year.

Of the operating uranium mine and mill facilities, Key Lake and Rabbit Lake operations have above ground tailings management facilities. Tailings are no longer placed in these above ground tailings facilities. They have been replaced at each facility by in-pit tailings management facilities that do not have dams.

For both the Key Lake and Rabbit Lake above ground facilities, the tailings are dewatered, consolidated and do not have a water cover. The Rabbit Lake above ground tailings management facility is shown in the picture on this slide.

The investigation report recommended that mines adopt best available practices and technology in construction and operation, such as filtered, unsaturated compacted tailings and a reduction of the use of water covers in a closure setting. Above ground tailings management facilities at uranium mine and mill facilities currently meet these summary recommendations.

CNSC staff conducted initial and follow-up geotechnical inspections of the above ground tailings

management facilities at Rabbit Lake and Key Lake in response to the Mount Polley incident and concluded that they are in a safe and stable condition and that no further work is necessary. CNSC staff will continue to inspect or monitor these above ground facilities to verify that they remain stable and safe.

As previously noted, further details and lessons learned from the Mount Polley event for all above ground uranium mines and mills tailings management facilities will be presented to the Commission later this fiscal year.

The Eastern Athabasca Regional Monitoring Program was initially established by the Province of Saskatchewan in 2011, building on the previous Cumulative Effects Monitoring Program. In partnership with the Government of Saskatchewan, industry and Saskatchewan communities, the program monitors the safety of traditionally harvested country foods, including the chemistry of water, fish, berry and mammals from representative communities located in Northern Saskatchewan.

The intent of the program is to evaluate the quality of country foods to assess any potential impacts resulting from industrial activities in and outside of Saskatchewan and to provide confidence to community

members that their traditional country foods remain safe to eat today and for future generations. The program includes the participation of community members in the harvesting of country foods for sampling and analysis, with the technical support of an aboriginal-owned environmental consulting company.

The Provincial Human Health Risk Assessment uses the Eastern Athabasca Regional Monitoring Program data and concludes that traditional harvesting of country foods does not present health risk to Northern Saskatchewan residents. Radiological dose to residents from consumption of country foods is below the public dose limit and results provide baseline data to compare future monitoring results. CNSC staff agree with the provincial human health risk assessment which confirm the country foods assessed were safe to consume.

CNSC staff are working with the Province of Saskatchewan to find opportunities for the CNSC to support this program. In particular, we are looking at opportunities to use the participant funding program to further support community participation, including aboriginal peoples in the Eastern Athabasca Regional Monitoring Program and in particular ongoing country foods studies.

Licensees continue to have in place public



information programs to engage communities in Northern Saskatchewan and keep them informed of the overall performance at uranium mines and mills and any major developments. These programs are regularly reviewed and verified by CNSC staff.

During 2014, CNSC staff regularly engaged with the public, aboriginal groups and their leadership through attendance at community meetings, site tours and technical information sessions. CNSC staff are participating in the next environment quality committee meeting in mid-October, where we will be providing an overview of the regulatory oversight report.

As well, this fall we are participating in industry-led science fairs in aboriginal communities in Northern Saskatchewan, where youth in the communities will be provided some basic training in environmental protection and radiation protection, with a focus on various jobs and work opportunities. CNSC staff are working on an introduction to the life as a regulator, with an overview of the role of an inspector.

CNSC remains committed to keeping interested communities informed by providing objective, scientific and regulatory information about uranium mine and mill facilities. In addition to these outreach activities, CNSC also provides information through the CNSC

website, social media and CNSC online.

The next few slides will discuss some developments in the new uranium projects.

AREVA's Key Lake project is a proposed uranium mine and mill project in Nunavut that has been the subject of an environmental assessment under the Nunavut Land Claims Agreement led by the Nunavut Impact Review Board.

CNSC staff have been actively involved in this process for the last six years as technical reviewers and subject matter experts. Prior to this, CNSC staff were actively involved in several outreach and engagement activities to assist the Government of Nunavut and various Inuit organizations as they reviewed the potential for the development of uranium mines and mills in Nunavut.

In March 2015, the Nunavut Impact Review Board conducted final public meetings in their review of the proposed Kiggavik Project. Their final report issued earlier this year was referred to the Minister of Aboriginal Affairs and Northern Development with a recommendation from the Board that the project not proceed due to the absence of a confirmed start date. A decision from the Minister of Aboriginal Affairs and Northern Development is pending.

Cameco's Millennium Project is a proposed

uranium mine project located generally between the existing McArthur River and Key Lake projects. The proposed project, which underwent an environmental assessment and licensing review, was originally targeted for a public hearing in mid-year 2014. The project was put on hold at Cameco's request pending more favourable economic conditions in the price of uranium. At this time the project remains on hold.

Strateco Resources' Matoush Project is an advanced exploration project in Quebec that was issued a licence by the CNSC in October 2012, which expires in October 2017. In 2012, the Government of Quebec decided not to issue a permit for the proposed Matoush Project and placed a temporary moratorium against uranium exploration and mining in Quebec. Since then, in the absence of a provincial permit, Strateco Resources did not undertake any CNSC-licensed activities at the Matoush site.

In 2014, le Bureau des audiences publiques sur l'environnement conducted a generic environmental review on the potential for uranium mining and processing in Quebec. In May 2015, a final report was submitted to the Environment Ministry in Quebec, namely le ministère du Développement durable, de l'Environnement et Lutte contre les changements climatiques.

The report recommended that the mining and

processing of uranium not be allowed at this time. The report is currently under review by the Ministry. CNSC staff are prepared to assist the Government of Quebec in its review of the report and to highlight the facts presented by CNSC staff during the hearings that do not support some of the key findings presented in the report.

This ends my part of the presentation. I will now ask Mr. Mark Langdon, Supervisor, Uranium Mines and Mills, to proceed with the rest of the presentation.

**MR. LANGDON:** For the record, my name is Mark Langdon.

The following slides will present the licensee's performance at the uranium mine and mill facilities.

There are currently five operating uranium mine and mill facilities in Canada, all located in the Athabasca Basin in Northern Saskatchewan. Cameco operates the Cigar Lake, McArthur River, Rabbit Lake and Key Lake operations, while AREVA operates the McClean Lake operation.

The facility licence terms are shown on this slide. All operating uranium mines and mills have been the subject of detailed licensing and compliance reviews, with public hearings and meetings.

This Regulatory Oversight Report for

Uranium Mines and Mills in Canada: 2014 is the fourth annual report presented to the Commission since 2012. The public has been invited to comment and participate on each of these annual reports over the last four years.

CNSC staff assessed licensee performance based on the 14 safety and control areas which are listed on the right side of this slide. Performance is assessed against set criteria, regulatory and licence requirements, performance objectives and CNSC staff expectations.

Ratings are assigned based on applying regulatory assessment and judgment to results of inspections, incident follow-up, desktop reviews, meetings and general correspondence. The level of staff review for each safety and control area takes into consideration the facility's specific activities and the risk that these activities comprise.

In 2014, the operating uranium mine and mill facilities received a satisfactory performance rating across all safety and control areas. As part of routine and focused compliance activities, CNSC staff verify and confirm the licensees have effective radiation protection programs to monitor and control radiation exposures.

Consistent with the principle of ALARA, radiation protection action levels are set to ensure early detection of potential problems to keep doses well below

the regulatory limit. There were no radiation protection action level exceedances at any facility during 2014. CNSC staff's compliance activities verified radiation doses were kept ALARA and workers were being protected.

The primary sources of radiation exposure at uranium mines and mills come from gamma radiation, long-lived radioactive dust, radon progeny and radon gas. This graph shows the maximum and average individual effective doses measured for workers at each of the five uranium mine and mill facilities during 2014. Both the annual average individual effective doses and the maximum individual effective doses at the five facilities were below the annual limit of 15 mSv in 2014.

As part of routine and focused compliance activities, CNSC staff verify and confirm that licensees have effective environmental protection programs to monitor and control the protection of the environment. Water quality action levels at the facilities ensure early detection of potential problems and ensure the protection of the environment.

In 2014, no environmental regulatory limits were exceeded. In 2014, CNSC staff's compliance activities verified that the environment was being protected.

Licensees are required to report to the

CNSC and other regulatory authorities any unauthorized release of hazardous substances or nuclear materials to the environment.

The number of 2014 reportable spills at each uranium mine and mill facility is displayed on this slide. For each of these spills the licensee investigated cause and implemented corrective actions to remediate and prevent a recurrence. CNSC rated all spills in 2014 as low significance and all spills were mitigated, leaving no residual impact to the environment. CNSC staff reviewed, verified and were satisfied that the licensees' reporting and responses to environmental spills during 2014 was acceptable.

This slide displays the treated effluent annual average concentrations in 2014 for the five operating mine and mill facilities. As shown, all annual average concentrations were below licensed limits. Please note that as there is currently no licence limit for molybdenum, the Key Lake action level of .6 mg/L is shown for reference. CNSC staff are satisfied that the treated effluent concentrations at the uranium mine and mill facilities are protective of the environment.

All metal mines and mills in Canada are subject to the *Metal Mining Effluent Regulations*. Compliance with the MMER limits provides a good

environmental performance indicator across the metal mining industry.

Data collected on this slide comes from Environment Canada and is provided for the 2013 year as this is the most current information available. On this slide, effluent quality compliance data for uranium mines and mills is compared to base metal, precious metal and iron mines. This table illustrates the number of mines in each mining sector that are out of compliance with at least one MMER parameter in 2013 and also provides the specific information on the individual parameters that are out of compliance.

In 2013, the uranium sector was in full compliance with the provisions of the MMER for all regulated parameters, which compares well to the other metal mining sectors.

All uranium mine and mill facilities demonstrate strong performance, mitigating atmospheric effects of their operations on the environment and conduct regular air quality monitoring. CNSC staff conclude that results indicate no risk to the environment from atmospheric releases and that the environment was protected.

High-volume air samplers are used to collect and measure total suspended particulate in air and



the particulate samples are also analyzed for metal and radionuclide concentrations. This slide shows radionuclide concentrations measured in ambient air at the uranium mines and mills in 2014. Concentrations of lead-210, radium-226, thorium-230 and uranium are well below the referenced annual air quality levels.

Lost-time incident statistics are a key measure of licensee performance. The 2014 statistics on the next slide demonstrate satisfactory performance in keeping workers safe from occupational injuries. CNSC staff confirm that the licensees provide effective oversight of health and safety.

A lost-time incident is a workplace incident that results in the worker being unable to return to work for a period of time. CNSC staff also considered the incident frequency and severity rate.

CNSC staff and the Saskatchewan's Ministry of Labour Relations and Workplace Safety monitor and review each reportable injury to ensure that causes identified and satisfactory corrective actions are taken. CNSC staff confirm that the mine and mill facilities implement effective management of conventional health and safety in their activities.

I will now present the summary of performance for Cameco's Cigar Lake operation.

Cameco's Cigar Lake operation is the world's second largest known high-grade uranium deposit. The picture on the right shows the surface facilities at the Cigar Lake Mine.

In March 2014, Cigar Lake mine began shipping ore slurry by truck to the McClean Lake mill. Mine production at Cigar Lake with jet boring system started in low grade uranium ore and has continually progressed into higher grade areas of the ore body. Radiation doses to workers at Cigar Lake in 2014 met regulatory limits and were kept ALARA. The Cigar Lake operation reported no lost-time incidents and CNSC staff are satisfied that Cigar Lake continues to protect the health and safety of workers.

In 2014, CNSC staff verified that treated effluent parameter concentrations were below regulatory limits. Cigar Lake had three environmental spills which were remediated with no residual environmental impacts. Air monitoring confirms no risk to the environment. CNSC staff are satisfied that in 2014 Cigar Lake continues to protect the environment.

Next, I will present a summary of performance from Cameco's McArthur River operation.

The McArthur River operation is the world's largest high-grade uranium mine. The picture on

the right shows the surface facilities. Cameco's McArthur River operation continued to focus on underground and freeze development in preparation for continued ore production. High-grade ore is mined and process to form an ore slurry that is transported to Key Lake for milling.

In 2014, radiation doses to workers met regulatory limits and were kept ALARA. There were no lost-time incidents reported at the McArthur River operation. For the third time in five years, McArthur River was awarded the John T. Ryan trophy for metal mines, which is an excellence award presented annually to the Canadian metal mine with the lowest accident frequency. CNSC staff were satisfied that McArthur River continued to protect the health and safety of workers in 2014.

CNSC staff verified that contaminant concentrations in treated effluent at the McArthur River operation were below licensed limits. There was one environmental spill which was remediated, leaving no residual impacts to the environment. Atmospheric monitoring at McArthur River operation confirms no environmental risk. CNSC staff were satisfied that McArthur River continued to protect the environment in 2014.

I will now present a summary of performance for Cameco's Rabbit Lake operation.

Rabbit Lake has been in operation since 1974 and operates both a mine and a mill. The picture on the right shows the mill facility at Rabbit Lake.

Cameco's Rabbit Lake operation continued underground mine operations in 2014, providing ore for its milling operations. Cameco expects the Eagle Point Mine to operate until at least 2018.

Reclamation activities continued in 2014 in accordance with the approved reclamation plan. The picture on this slide shows hydroseeding taking place at Rabbit Lake. The next couple of slides display the progress of reclamation in two areas at Rabbit Lake.

This slide shows the 2014 status of reclamation of the A-Zone dyke. The former A-Zone open pit was located to the left of the dyke in both pictures. The 2009 picture on the left slide shows that the A-Zone dyke as it was being excavated to provide a water channel between the dyke and the mainland. The 2014 picture on the right displays the A-Zone dyke with the completed water channel in the foreground and five years of vegetation growth from planted saplings on the former dyke.

This slide displays the ongoing reclamation of B-Zone waste rock pile at Rabbit Lake operation with pictures from 2011, 2012, 2014 and 2015.

The B-Zone waste rock reclamation

activities started in 2011, as in the top left picture. The waste rock had been contoured. In 2012, the waste rock pile was shaped and an engineered cover placed, which was subsequently hydroseeded with an approved grass-seed mixture. A vegetative cover has been established, as shown in 2014 and 2015 images. Over time the natural vegetation of the region will gradually replace the current grass vegetation. CNSC staff will continue to assess the effectiveness of the reclamation of the B-Zone pile.

At Rabbit Lake, radiation doses were kept below regulatory limits and ALARA. There was one lost-time incident. CNSC staff observed effective management of the health and safety risks and that Rabbit Lake continues to protect the health and safety of workers.

In 2014, CNSC verified the contaminant concentrations in treated effluent discharged to the environment complied with licensed limits. There were four environmental spills that were remediated, with no residual impacts to the environment. Atmospheric monitoring confirmed no risks to the environment. CNSC staff were satisfied that Rabbit Lake continued to protect the environment in 2014.

Now, I will present a summary performance for Cameco's Key Lake operation.

Cameco's Key Lake Mill is the world's

largest producer of yellowcake. The picture on the right shows the Key Lake mill operation.

In 2014, Cameco's Key Lake operation continued to mill McArthur River high grade ore. In July 2014, the Commission accepted the environmental assessment report for the Key Lake Extension Project. This allowed an increase in the annual uranium production rate and an increase in the elevation of tailings disposal within the existing Deilmann Tailings management facility. The tailings expansion provided approximately 40 years of additional tailings management capacity at the anticipated mill production rate.

And also of significance, construction continued for the new horizontal rotary calciner to replace the aging existing vertical calciner.

At Key Lake in 2014, radiation doses were kept below regulatory limits and ALARA. There were no lost-time incidents and CNSC staff observed a strong focus on accident prevention. CNSC staff observed effective management on health and safety risks and that Key Lake continues to protect the health and safety of workers.

In 2014, at Cameco's Key Lake operation, the treated effluent discharge complied with licensed limits. There was one environmental spill that was remediated with no residual impacts to the environment.

Atmospheric monitoring results confirmed no risks to the environment. CNSC staff are satisfied that Key Lake continues to protect the environment.

Now, I will present a summary of the performance for AREVA's McClean Lake operation.

The McClean Lake mill has been designed to process high grade Cigar Lake ore. AREVA's McClean Lake suspended milling operations in July 2010 due to a lack of ore. Cigar Lake ore slurry shipments began in March 2014. However, the McClean Lake Mill was not started until September 2014 due to modifications being made to the leaching circuit.

At the McClean Lake operation in 2014, radiation doses were kept below regulatory limits and ALARA. There were three lost-time incidents. CNSC staff were satisfied that McClean Lake continued to protect the health and safety of workers in 2014.

At McClean Lake, CNSC staff verified the contaminant concentrations in treated effluent were below licensed limits. There were two environmental spills which were remediated, leaving no residual impacts to the environment. Atmospheric monitoring results confirmed no risks to the environment. CNSC staff are satisfied that AREVA McClean Lake continues to protect the environment.

I will now present the conclusions to our

presentation.

Based on CNSC staff's compliance activities, which include site inspections, review of licensee performance, desktop reviews, events and incident reviews, general communication and exchange of information with the licensees, CNSC staff conclude that in 2014 a satisfactory performance rating was assessed for all 14 safety and control areas for the five operating uranium mine and mill facilities, that the licensee's radiation protection measures were effective in keeping doses as low as reasonably achievable, that their environmental protection programs were effective at protecting the environment and that their conventional health and safety programs continued to protect workers.

CNSC staff conclude that in 2014 each regulated facility operated safely and met performance expectations with respect to the health and safety of persons and for the protection of the environment and to Canada's international obligations.

I will now pass the presentation back to Mr. David Newland.

**DR. NEWLAND:** For the record, Dave Newland.

That concludes staff's presentation and we are available to answer any questions that the Members may



have. Thank you.

**THE PRESIDENT:** Thank you. Before getting into the questions, I would like to hear whether Cameco has any comments.

**MR. MOONEY:** Good afternoon, President Binder and Members of the Commission. For the record, my name is Liam Mooney. I am Cameco's Vice President of Safety, Health, Environment Quality and Regulatory Relations.

With me today is Kevin Nagy, our Director of Compliance and Licensing for our uranium, mining and milling operation in Saskatchewan.

I want to start again by emphasizing that the health and safety of the people and the protection of the environment are our top priorities. Cameco is justifiably proud of our performance in the areas of safety, health and environmental protection, as reflected in the annual CNSC staff report on uranium mines and mills.

Through Cameco's successful history of operating its facilities, we have in place robust management systems that cover these areas. Strong performance in conventional safety is evidenced by both the continued low rate of lost-time incidents at all of our facilities as well as external recognition such as McArthur River receiving the national John T. Ryan award for metal

mines two years in a row.

Monitoring shows that our radiation protection programs continue to maintain worker doses as low as reasonably achievable and well below regulatory limits. We are compliant with all environmental regulations and our continuous monitoring of these facilities confirms the health and safety of people and the environment are protected.

We are also pleased that the CNSC staff continue to highlight the results of Saskatchewan's Eastern Athabasca Regional Monitoring Program. This program shows that country foods harvested and the water in the region of Saskatchewan's uranium mines and mills remains safe to eat and drink, respectively. As the associated Human Health Study concluded, these foods should be part of a healthy diet of local stakeholders. This program and its conclusions provide another layer of assurance for stakeholders in the vicinity of our Northern Saskatchewan operations that they can continue to safely enjoy a traditional lifestyle.

The Mount Polley tailings event was before the Commission a year ago, at the time the 2013 report was presented, and it is updated again with this year's report. Since the last time we were in front of the Commission, Cameco has had the opportunity to review the findings of

the independent investigation that was published in early 2015. Our review did not identify any concerns related to the specific conditions that led to that event that were applicable to our tailings management facilities.

In the result, we are pleased that consistent with our submissions on this matter, the CNSC staff have confirmed the geotechnical stability of our above ground facilities at both Key Lake and Rabbit Lake.

We have also worked to increase the understanding of tailings in discussions with northern stakeholders through the Environmental Quality Committee and the Athabasca Working Group. In facility tours last year and this year we have emphasized with our stakeholders that tailings in the above ground facilities remain dry and consolidated within a stable structure. We are confident in the design, construction and operation of our tailings management facilities and that the risk posed by these facilities remains very low and well managed.

As the staff report also notes, Cameco completed our root cause analysis into the two calciner events that occurred at Key Lake in the first months of 2015. Cameco remains committed to implementing the corrective actions identified in the root cause analysis and applying those lessons at Key Lake as well as our other operations.

In 2014, all necessary operations, inspections and monitoring were completed in compliance with our licence and Licence Condition Handbook.

Overall, we believe the report you see today reflects Cameco's ongoing commitment to strong performance in protecting the environment and health and safety of workers as well as the public.

We are happy to respond to any questions that you might have for us.

**THE PRESIDENT:** Thank you.

Any comments from AREVA?

**MR. HUFFMAN:** Yes, thank you. This is Dale Huffman, the Vice President of Health, Safety, Environment and Regulatory Relations for AREVA Resources.

I am joined here today by Jim Corman, our Vice President of Operations and Projects, and Jack Richards, our General Manager at McLean Lake.

It's always difficult to follow Mr. Mooney and his comments so I will not attempt to. We have -- I have no additional comments at this time. We have read the report and we are pleased to answer any questions that you may have.

Thank you.

**THE PRESIDENT:** So it is my understanding also, so we have representatives from the Ministry of

Environment and Ministry of Labour that are available to answer questions that will come up.

**MS EATON:** Yes, that's correct.

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

So let's get into the question session starting with Monsieur Harvey.

**MEMBRE HARVEY :** Merci, Monsieur le Président.

Well, my first question will be to Cameco. When we talk about the new calciner which is under construction, when will it be completed and will the old system be completely abandoned when the new one will be in operation?

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

The new calciner is undergoing commissioning activities and the existing calciner will continue its usage throughout the balance of 2015 until the new calciner has completed commissioning and then the existing calciner will remain as a backup while we continue to operate the new calciner at Key Lake.

**MEMBER HARVEY:** So can I expect that will be early in 2016 that it will be in operation?

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

It is dependent on the commissioning of the new calciner, but it is a reasonable expectation that the new calciner will be operational in 2016.

**MEMBER HARVEY:** Thank you.

Just one question or two questions.

In your presentation about Rabbit Lake operation, slide -- well that's, I suppose 54-55. This is the picture we have of the reclamation zone, zone dike.

So we see those pictures and how it is going, but is it going as expected? Is it as it has been predicted? Are you satisfied with the current progression?

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

Yes, we are satisfied with the progress that is being made. It's something we always put a lot of emphasis on because the reclamation is doing final clean-ups and we certainly want them done sooner rather than later.

Perhaps I could ask Mr. Glenn Groskopf, who is the Senior Project Officer for Rabbit Lake, if he could perhaps add a few comments with regards to his recent inspections and observations at Rabbit Lake.

**MR. GROSKOPF:** Thank you, Jean.

My name is Glenn Groskopf, Project Officer for the Rabbit Lake.

And I have gone up there and actually physically walked on that island. It is progressing. It's a little bit deceiving and those trees that you see are actually probably about four feet tall.

But it is progressing. Cameco actually has a program where they are looking at the success on those re-vegetation and they have actually gone back and hydro-seeded and planned additional plantings at different locations on site to continue the development.

Physically there is no erosion. It's stable, looks chemically stable. So we are continuing to observe the progress but it is certainly doing well. As you can appreciate, Northern Saskatchewan can be a bit of a harsh environment. On the open water there it can be more difficult to get vegetation as well established as you would somewhere more sheltered.

**MEMBER HARVEY:** Thank you.

**THE PRESIDENT:** So just to follow-up on this, things are going so well -- by the way, I really like your appendix for staff where you put some -- all the plans for decommissioning with an end-game going to institutional control.

So does it make sense to allow for some parts of the mine to go into institutional control while the mine is operating, if it's ready at all to go into

institutional control?

**MR. LeCLAIR:** Certainly it's something that can be looked into. It would be something that the licensee would have to apply for but there is really no restriction that would prevent that from happening.

There will be an interest, in fact, on the part of the companies as well because in doing that their liabilities are reduced, their needs for maintaining a number of other provisions with the province would fall out. So there is opportunities for that to be done.

**THE PRESIDENT:** But staff will have to agree that it's ready for this as well.

**MR. LeCLAIR:** Yeah, I think it's very important to note that, yes, before any -- before any recommendation would be brought forward to the Commission to exempt a certain portion of the site and transfer it into institutional control we would do a thorough review of the work that has been done, ensure that we are satisfied with the actions that have been taken, that conditions are stable and improving and then we would come forward with a recommendation to the Commission for exemption.

**THE PRESIDENT:** Cameco, are you contemplating something like that?

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



We have not contemplated that at this time. We would look for opportunities as we continue to monitor the facilities to make the case both to the CNSC and the province that the properties are in fact safe, stable and recovering before we would proceed much further on moving them into institutional control.

**THE PRESIDENT:** Thank you.

Dr. McEwen...?

**MEMBER MCEWAN:** Thank you, Mr. President.

On page 6 you discuss the radiological exposures to residents in the northern communities. How are calculations and estimations done? How is the methodology performed and how is it validated so that there is confidence in a very confident paragraph?

**MR. LeCLAIR:** Just give me a minute here. I'll check to see who we are going to have to answer. Just one second.

--- Pause

**MR. LeCLAIR:** Oh, sorry. This is in reference to the Eastern Athabasca Regional Monitoring Program results, I believe, if I am understanding correctly.

Unfortunately the best person to be able to speak to this would have been Dr. James Irvine and he is not available to speak to it, but this is the work that

they have done. It's based on the sampling programs that they do through the program -- also, Dr. Kevin McCallum who is the Ministry of Environment person.

I am going to look to Saskatoon. We have Mr. Tim Moulding with the Ministry of Environment who perhaps can speak to this and then we can pass it back. But I don't want -- see if Tim can perhaps provide some further information.

**MR. MOULDING:** It's Tim Moulding, Manager for Uranium and Northern Operations with the Ministry of Environment in Saskatchewan.

Could you restate the question again, please?

**MEMBER MCEWAN:** So there is a very confident statement here that radiological exposure presents no risk. How is the methodology developed to actually come up with the calculations and how is that methodology validated so that we have confidence in that paragraph?

**MR. MOULDING:** Again, this isn't my particular field of expertise but, again, with the measured concentrations that they are finding in the samples they are taking, the levels are quite low. So I would imagine that it's based off the calculations that are done in that regard.

As Mr. LeClair mentioned there, the best person to answer that question would be Dr. James Irvine with the Health Region in La Ronge.

**THE PRESIDENT:** Dr. Thompson, I know there is a lot of work been going on by the Minister of Environment, particularly for cumulative effect of the whole Athabasca Region. So maybe you can provide some information about that?

**DR. THOMPSON:** Patsy Thompson, for the record.

We have done a detailed review of all the reports that have been developed. We validated the methods that have been used. Essentially, the calculations are based on measurements of things people need essentially. So they have got drinking water samples, samples of fish, some berries.

We also have done through our research and support program, a dietary survey to find out essentially the amounts of various types of food, wild foods and country foods that people in Northern Saskatchewan consume. So those assessments are done based on the results of that dietary survey and represent a conservative Aboriginal diet.

**THE PRESIDENT:** And correct me if I'm wrong. Many of those studies -- I remember in some of the

previous hearings many of those studies are now available from the health, Regional Health Authority. But I am also talking about the large project about the cumulative effect that has been going supposedly by the Ministry of Environment. Where is that? Where is that study?

**DR. THOMPSON:** So Patsy Thompson for the record.

So there is work ongoing to look at cumulative effects in the Athabasca Basin that would include essentially impacts from activities in Alberta in that part of the basin and going into Northern Saskatchewan. The focus has been on the parameters that would be related to the oil sand industry and those types of contaminants. And for Northern Saskatchewan the program also includes radiological components because it's of interest to Aboriginal groups in Northern Saskatchewan.

So that program is in place, has been funded essentially for a number of years. We have met with Saskatchewan officials responsible for that program and also doing some of the coordination with Alberta officials.

But essentially the report -- the results that are reported in the CNSC report have been validated by staff. The laboratory measurements are appropriate and, certainly, the pathways and those assessments have also been validated.

**THE PRESIDENT:** Dr. McEwan...?

**MEMBER MCEWAN:** So I think, again, for a report like this to be helpful to at least perhaps have an appendix with a little summary of some of the data and references so to be able to go back and look at it, to just to have confidence if you are reading it. But that's actually a good statement.

When we were --

**MR. MOONEY:** Sorry. Dr. McEwen, sorry. It's Liam Mooney, for the record.

One of the pieces with respect to that Eastern Athabasca Regional Monitoring Program was the community outreach in relation to it. There is an annual budget provided for the communication of the results of that monitoring program and the data as well as the reports that I have prepared by the province are available on a dedicated website, Eastern Athabasca Regional Monitoring Program.

**MEMBER MCEWAN:** Thank you.

So when we were discussing slide -- I think it was 13 -- there was a comment made that the northern lakes are not a source of drinking water, the implication being that maybe it wasn't necessarily that important to be concerned.

Is there any impact, again as you look

down the food chain, from animals drinking the water or fish in the water that then makes its way into the food chain? Does that become a concern or is it -- were you simply looking at humans drinking that water?

**MR. LeCLAIR:** Just to clarify where I made that statement, it wasn't made to diminish or devalue the importance of the water. Certainly that was not the intent. It is more intended to just identify that the location of the sites and where the water was, was located relative to it. So it wasn't in any way meant to diminish the importance of the water. Certainly it is very important to the people. That was more for a matter of geography to provide some perspective, is all.

**DR. THOMPSON:** Perhaps just to add, the statements are made in relation to many of the sampling locations that are within the east boundary of the mines and in that sense there is no potable water sources that are using the receiving environment. But certainly as you get offsite through recreational and traditional land uses there is -- there are people drinking water and the measurements off sites demonstrate that the water meets water quality guidelines very easily.

**THE PRESIDENT:** Thank you.

Mr. Tolgyesi...?

**MEMBRE TOLGYESI :** Merci, Monsieur le

Président.

I come back to the manpower a little bit. You are talking about nuclear energy workers, fulltime equivalent employees. Do these figures include also contractors or others who are working in the mine?

**MR. LeCLAIR:** Yes. In fact, all these statistics that are provided are -- cover for all the contractors and it also applies to the lost time incidents, for instance.

If we go back, at one time the two tended to be treated separately and often the numbers that were reported were for employees only. However, since for quite some time now the LTI, radiation results, everything, is all -- covers everybody; employees and contractors as well.

**MEMBER TOLGYESI:** I am asking you that because if you look on the -- there are two things. On page 134 I will take McArthur River operation, for example. There is 1,149 nuclear energy workers. There is 692 fulltime employees. So there is some clarification to be done. Probably you should add somewhere the total number of employees also so it will -- you know, to clarify to some extent how come we have about two times more nuclear energy workers than fulltime employees.

**MR. LeCLAIR:** Certainly. We will take that under advisement how we can provide further clarity on

this.

But I think the key -- the key thing is number of nuclear energy workers is the number of people who worked at the site who were in positions that have the potential of exceeding the public dose limit and that would include employees that may have been there for a shorter duration. At the mines there is often extensive contract work that is being done, construction activities that could be involved. So there is shorter duration activities that could be measured in weeks or months. So that would increase the number of nuclear energy workers without necessarily -- that would represent a much higher number than the number of fulltime equivalents.

But we will certainly look at how we can further supplement and add more clarity in the report to make that clearer going forward.

**MEMBER TOLGYESI:** Also, when you are looking to equivalent fulltime employees you are using 2,000 hours figure whereas in the industry when you look in general, you are working 1,800 hours, you know, working hours. So it will increase the fulltime equivalent of employees' number also.

--- Pause

**MEMBER TOLGYESI:** I am sorry. I am looking at the report. There were spills and at Rabbit



Lake on May 19 there was a crack in a pipeline that resulted in 10,000 litres of contaminated rice was spilled. It was going to the tailing pond.

Was it -- was it this crack or how do you call that, in a pipeline on the ground or, you know, if you have a long pipe which is in the pit, in the tailing pit? Because you are saying that all release water was captured. Was it captured in tailings, in-pit tailings so it was not into the environment or it was on the ground where you did a collection and cleaning?

**MR. LeCLAIR:** So it was contained within the tailings management facility. As a result it would not have been released into the environment because the facility contains the water. It holds the water in.

But perhaps we could ask again Mr. Glenn Groskopf who is the Project Officer for Rabbit Lake to elaborate a bit more on the event and we could perhaps also ask Cameco if they would like to add to that.

**MR. GROSKOPF:** Thank you, Jean. It's Glenn Groskopf, Project Officer for Rabbit Lake.

My understanding was, as described earlier, that it was -- any flowing water was captured within the catchment for the in-pit tailings facility and it did not escape to the open environment.

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

record.

I wanted to add in relation to that particular event that the environmental impact was considered minor. We estimated that the maximum duration of the event was about one hour.

As indicated by Mr. Groskopf, the tailings -- the released raised water reported to the tailings management facility, it was actually caught by the daily inspection patrols by the in-pit, for the in-pit tailings management facility.

After it was identified, the flow to the line was halted and the line was drained to prevent further release and the pipe was repaired immediately by the maintenance department thereafter.

**THE PRESIDENT:** Thank you.

Ms Velshi...?

**MEMBER VELSHI:** Thank you, Mr. President.

My first question is on the Eastern Athabasca Regional Monitoring Program. So on page 6, and maybe staff can answer that or folks from the Ministry of Environment, the second paragraph that says the data shows that for most chemical concentrations it was below guidelines. So I just wondered which ones were not below guidelines and why do we have most if not all.

**MR. MOONEY:** So it's Liam Mooney, for the

record.

And we looked into that when we saw the note in the staff report. The one sample that was elevated in comparison to the Guidelines in the 20 -- 11/2012 program was specific to mercury in one lake trout sample. Our operations are not a source of mercury to the receiving environment. In fact, our monitoring near our operations show mercury consistently below laboratory detection limits. So ultimately, mercury was an identified contaminant and we are not the source of mercury in any of the receiving environment.

**MEMBER VELSHI:** Thank you. And my --

**MR. LANGDON:** Mark Langdon, for the record.

My understanding, part of that answer is that some of the caribou, et cetera that were handed in for samples that were analyzed, they were shot with shotguns and things that had lead things in it, so some of that contaminated some of the meat and gives higher numbers. So they took that into account when they looked at some of the analysis.

**THE PRESIDENT:** But again, as a suggestion for improvement, the moment you put the word "most" on contamination you know you are going to raise an interest from us to know what didn't make it. So you have to put

some explanation rather than leaving it hanging there.

**DR. NEWLAND:** Noted.

**THE PRESIDENT:** Ms Velshi...?

**MEMBER VELSHI:** So before I get to my second part of that country food review, in my opening comments, oversight on my part, I did want to compliment AREVA, Cameco, the CNSC staff and the provincial regulators on a very good year and a good performance.

And to some quick feedback on your overhead slides, whereas the written ones, the colour looks good, it was very hard to read where you had the shading. I am surprised you didn't see that in your dry run, but I am sure people will tell you that.

So my second part to that study was, so is there confidence amongst the people that it's safe to eat the food or is there a decline in consumption?

**MR. LeCLAIR:** The -- it's a very interesting question.

People continue to harvest and consume the country foods. That being said, I believe Dr. James Irvine would be in a better position to speak to it.

However, I've heard him say it in the past, and I'll speak a bit on his behalf, is there's a lot of pressures for communities to eat non-traditional country foods because they're more easily accessible, so that puts

a lot of pressure on people to start consuming more non-traditional diets, things that are higher in fats, things that often contribute to some of the health issues that we see in the northern communities with the residents, high sugar diets, so diets that are not traditional for aboriginal peoples.

However, Dr. Irvine, in fact, is one of the biggest proponents and certainly encourages continuing to harvest and consume traditional foods.

So there's pressures -- there's certainly -- there's always that concern that we're always working with them to make sure that they are satisfied that the food is safe to eat, but there's also that other pressure that other foods are available, and more readily available.

**MEMBER VELSHI:** Thank you.

My second question is around your conventional safety numbers that have been presented, and I was a little surprised to see and read those years when a facility had no lost time injuries but they had an associated severity rate. And I read in the notes that it was because of people who'd been off work from a previous year and were still taking time off.

But my understanding was that the way you calculate severity rate is you tried -- at the end of the

year, tried to estimate how much longer they're going to be away. And it's the year that the injury occurred in that gets charged with that severity rate.

I believe that's how it, at least, used to happen for nuclear power plants, but is that not a consistent way of measuring severity rate?

**MR. LeCLAIR:** Since those statistics actually compile through the workplace health and safety out of the province, perhaps we can ask them if they can answer your question?

**MEMBER VELSHI:** Thank you. Yes.

**MR. KASKIW:** This is Len Kaskiw, Chief Mine Inspector for the Province of Saskatchewan.

I really can't respond to that because your -- my understanding is the same as your understanding, is that's how it's calculated, so without having a good look at the stats themselves, I wouldn't be able to answer that.

**MEMBER VELSHI:** Okay. Well, maybe the staff can take that away and clarify the consistency of that.

So that was one part on the safety. The other one -- and we've talked about this at previous annual report reviews -- is the reporting of near miss incidents. And I know in the report, certainly you have mentioned some

significant ones that have occurred and that I -- and I believe both Cameco and AREVA have a robust incident reporting system. But is there a systematic way of you to collect potentially very serious near miss incidents and then report those back to us, or is this done more on an ad hoc basis?

So if you -- I can't remember where I'd read one, but there's certainly one -- was one maybe on page 76 or 77 of the report.

**MR. LeCLAIR:** So we have access to all their -- the statistics and all the information that they gather, so when, as part of our inspections, we review the different incidents, so there's reportable events. Of course, we're made -- we're automatically made aware of under reporting requirements, LTIs in particular, but near misses are statistics that are collected and I agree with you that licensees do gather that information. And we can -- we do review that information.

And certainly we can look, going forward, how we might be able to roll that into the report to enrich it and make it a bit better.

**MEMBER VELSHI:** Thank you. That would be helpful.

Thank you.

**THE PRESIDENT:** Thank you.

**MR. HUFFMAN:** Excuse me. Can I add, Dr. Binder --

**THE PRESIDENT:** Go ahead.

**MR. HUFFMAN:** Can I add something to that? It's Dale Huffman, with AREVA.

Something that we are in the practice of reporting in our annual report each year and as notifications as dangerous occurrences, so when dangerous occurrences occur as defined by either the *Occupational Health and Safety Act* here in Saskatchewan, the *Mines Act* or even under the *Transport of Nuclear Substances*, we are reporting those dangerous occurrences and they do appear in our annual report. So there's an opportunity to look at those, and those constitute good presentations of near miss serious events at our mine sites.

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

Monsieur Harvey?

**MEMBER HARVEY:** Merci, monsieur le president.

On page 42 in Figure 3-8, it's the Cigar Lake operation concentration of uranium for the last five years. When we see that box 2010 to 2014 and the concentrations, each year, we've got a factor and you multiply the year before, 2011, two times, 2012, three times 2011, 2013, two times 2012 and then, in 2014, is 18



times 2013.

So keeping the same order of factor, next year would be over the CNSC objective. So I would like you to comment that, and what is -- I think that that is to do with the operation with the mining. But despite that, if next year we multiply by 10 would be well over the .1 milligram per litre.

So can you comment that?

**MR. LeCLAIR:** I believe you summed up well in saying that it's a reflection of the activities that were going on. Cigar Lake entered into operations in 2014, which is why you actually see the much more substantive increase in that concentration. But it's simply tied to the fact that once they started actually mining and processing the ore, that would, as you would expect, start leading to slightly more elevated concentrations of uranium.

I want to certainly qualify it by saying that certainly it's not an indication that it should go up another 10 times by next year. These are things that we look at regularly, so the result is not surprising to us, particularly in 2014, because it did enter into operations. And I can assure you that we would not be coming back to you to say that they're now exceeding a limit because we weren't looking at it.

So we do look at this very, very closely. We are monitoring it and, like I said, I think the -- what you're seeing here is a reflection of the actual change in the operations of the site, which is what we would expect the difference between construction of the site and the actual operation of the site.

**MEMBER HARVEY:** But will the mining, the operation next year, be about the same that it has been in 2014?

**MR. MOONEY:** Sorry. It's Liam Mooney for Cameco Corporation.

I just wanted to come in on that to provide you some assurances, Commissioner Harvey, that our 2015 data show that the concentrations have not taken that sort of step change or anything near it. We have seen some slight increases, but we continue to optimize the treatment circuits as required and continually improve performance.

So that trend that you've highlighted, that's not what we're seeing in the 2015 data.

**MEMBER HARVEY:** Okay. Well, we'll wait and see. Thank you.

Well, I have a similar question on page 88 of the Key Lake operation, 6-2 in the table there.

Once again, the increase from 2010 to 2014 is by three, by four, by two, so it's -- maybe it's also

late for the operation, but I would like to -- you to comment on that. Page 88.

You see the -- mainly how the factors -- all the parameters. If you see arsenic, uranium and anyone -- if you'll -- you look at 2010, for example, the last one, uranium, got 0046 and you got 0079. So it's very small figures, but there is an increase which is not able. That's two times. It's about two times.

You don't agree, Mr. LeClair?

**MR. MOONEY:** It's Liam Mooney for Cameco.

I would only add in that regard that the emissions to air as well as ambient concentrations surrounding their operations are routinely monitored and the results are reported. Emissions to air from our facilities are low and the table that you point -- are pointing to on page 88, you can see that they're -- even with those small increases, they're still guideline numbers that are provided in the table.

**MEMBER HARVEY:** I agree. That's a very small figure, but despite that, if you take the first one, arsenic, you've got three times in 2014 what you had in 2010, so I agree that it remains small figures.

**MR. MOONEY:** So I guess -- it's Liam Mooney again.

I would only add in that regard that we'll

continue to monitor our ambient air quality and emissions and if there's a trend identified that's of concern to us based on the information that we collect, we would look at investigating it further.

**MEMBER HARVEY:** Okay. Thank you.

**THE PRESIDENT:** Thank you.

Dr. McEwan?

**MEMBER MCEWAN:** Thank you, Mr. President.

If we move to page 89, the sulfur dioxide concentrations, again, I think part of the problem I've had in reading this section was related to just a lack of enough information to describe exactly what happened and what was done.

So for example, there is a discussion of five sites in the last paragraph chosen with near field and far field influences. It would have been very helpful to have a map of just where those samples were taken and to give some sort of visual impression of the distances.

Then on the next page, there's talking about just taking soil samples from the immediate vicinity. So if you were sampling on the one page at five sites in the near field and medium field, but only immediate vicinity in this area, there was a lot of inconsistency. And I just couldn't find it easy to wrap my head around exactly where the data were coming from and whether you had

the same confidence in the near field as in the far field, and vice versa.

**MR. LeCLAIR:** Again, I'll say duly noted. Make a note for next year to be able to elaborate on that, adding a map.

**THE PRESIDENT:** I really -- more than just a map.

You know, when you read -- you know, you have Zone A and Zone B and it's so meaningless to us unless you locate them in a particular geography so we can see where they are in the site. And you know, and maybe even the contour of the land so we can see some of the flow of surface water.

We need to -- we need to see some maps and maybe graphs about the location so we understand what's happening between some of those sites.

It's really difficult to follow some of the logic here that -- Dr. McEwan just gave you one example, but there are many in many of the sites that you describe a process, and without showing the map and the structure, we can't understand it.

**DR. NEWLAND:** Noted.

**MEMBER MCEWAN:** So if I can go to page 11, and again, it's the importance of a diagram, I think, because I remember the two EIRs that this diagram

references. But I think it's -- when I read this, it was the only time I actually put the two events together and sort of really worked out.

So if there is a significant event like this caused by mechanical failure, would it not be incumbent upon the licensee to actually do a full inspection of the whole system to ensure that there isn't some element of risk at other parts of it because for these two to occur a month apart suggests that there was a point of failure developing in the second event whilst the first one was being investigated.

**MR. LeCLAIR:** So just -- I think Cameco will have to be the one to elaborate further on what they've done, but just to provide some context is -- because I think they're in a better position to talk about what they looked at and what they observed.

But the second event was not visually observable. You could not have seen it going on because of the cladding and the material around the duct, and that was the reason why there were some inspection ports that were added. There's some other things that were added to it to make it more easy to identify if, in fact, there was a problem, but I think Cameco should actually answer your question with regards to their verification that they did following that first event and elaborate on that further.

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

And with respect to the first incident, the facility was voluntarily shut down for quite some time while there was a thorough investigation of the system as it was termed. As Jean LeClair pointed out, the issue was that the exhaust ducting wasn't visible and so one of the corrective actions that was put in place was to install some ability to inspect beyond the cladding that's on that duct work.

So I guess I'd say that it's unfortunate that they are related to the same system, but the root cause analysis didn't find that they were related events.

**MEMBER MCEWAN:** So again, I think it would have been helpful to have a little bit of that detail in this report. I actually remember it as we talk about it from the initial events, but just to basically put a little more detail around what happened in the second event and the corrective actions.

It's -- you know, you've got one paragraph there which basically summarizes in three lines the post-event remedial actions.

I think for something like that, more detail would have been very helpful as I read it. I have an imperfect memory going back nine months.

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

Mr. Tolgyesi.

**MEMBER TOLGYESI:** On page 29, you compare uranium to other sectors in mining for toxicity tests. In general, there are two toxicity tests. One is a rainbow trout, acute lethality. Another one is a Daphnia, which other mining sectors are using. So uranium is using only rainbow trout.

Do you think it's a fair comparison? Because there are two -- there is other tests also which, if they fail, they fail.

**MR. LeCLAIR:** So they do more than the acute lethality tests on rainbow -- rainbow trout. Glenn's a popular person here this afternoon. Glenn Groskopf is the person who wrote this section of the report and previously worked for Environment Canada. If I could ask Glenn Groskopf if perhaps he can elaborate a bit more on the testing that's done for lethality.

**MR. GROSKOPF:** Thank you, Jean. Glenn Groskopf.

As Jean discussed and alluded to was there is a mandatory requirement to pass acute lethality for rainbow trout, and that's what's reported here in the report. As well, all metal mines in Canada, including uranium mines, are required to do acute lethality testing



for Daphnia Magna, which again, as you mentioned.

However, it's not required to pass that test. It's only being used at this point as a monitoring test to -- one of the reasons is to accumulate enough data to see if that is a reasonable test for the mining sector in terms of characterizing its effluent.

So consequently, it was decided in the drafting of the report that we would not report the Daphnia. If you look at some of the past years' reports, I believe it was reported there, and certainly that data is available.

I guess -- I hope I've answered the question.

**MEMBER TOLGYESI:** So you don't report that here because it's not mandatory.

**MR. GROSKOPF:** It was an editorial decision not to report it in this report. It is reported to us.

**MEMBER TOLGYESI:** Is there any reasons why we do not report that if we did it in the past?

**MR. GROSKOPF:** Perhaps I'll toss the question to Jean, as he probably has the bigger picture answer for that.

**MR. LeCLAIR:** That's more a matter of trying to figure out how big we go and what level of

detail. We set it up with these two because they are tied to actual limits.

The intent of this section was to do a cross-mine comparison to compare them to provide information.

Last year, actually, if I can permit myself, one of the big changes we made from last year to this year was actually based on your comment, Mr. Tolgyesi, with regards to we had it as percentages of compliance and the table that you'll see, Table 2-4, is actually -- we believe is an improvement that we made following your recommendation.

Instead of representing it as percentages, which there was a concern that it might not be an accurate reflection on the performance of the other mining -- the other mining sectors, we changed the table to actually show you the actual numbers now without getting into percentages so you can see how many samples were taken, how many of them actually did not pass.

So these are always improvements that we're trying to make going forward. So the reason why the report is that way is, in fact, it is a reflection of what we understood from feedback that we've had, so that's all I can say.

**THE PRESIDENT:** I just wonder how well

known are those -- the relative comparison here because, as you know, uranium mining is getting special attention in the public. I just wonder if they know about the performance of some other mines.

I was very struck by the precious metal 29 out of 400 fail, you know, the tests here. I think I know another agency and another government that should be interested in this kind of observation.

And while I got the floor here also, in -- on page 28, you're talking about on some base metal mines effluent concentration of radium-226, which is higher than uranium mines, so I have a serious question. Do they use dosimeters for their miners?

**MR. LeCLAIR:** So the conventional mines, non-uranium mines and metals, are regulated by the individual provinces and there are provisions that are in place for dealing with naturally-occurring radioactive materials. We're part of a cross-country working with provinces in setting up standards.

I'm not aware whether there would be dosimetry programs in place within conventional mines. Again, they're subject to provincial regulations.

I would, though, like to add that slightly elevated radium-226 that you would find in the discharge waters at a base metal mine would not immediately be a

reflection on potential doses to workers within the mine itself. But I can't elaborate in detail other than to say --

**THE PRESIDENT:** But you know, historically, that was, again, one of the reasons we start insisting on better ventilation and more measurement because of concern of some of those things.

So I see Dr. Thompson wants to have the floor here. Go ahead, please.

**DR. THOMPSON:** Patsy Thompson, for the record.

In terms of conventional mines and potential radiological exposure, there is a national radon action plan, and radon has been identified in some mining sectors and some industrial sectors as being an issue to manage and better control.

So there is a Federal Provincial Territorial Radiation Protection Committee document that was posted on Health Canada's website last year that speaks to provincial actions to manage radon exposures among workers, and depending on -- they do workplace assessments, and depending on the potential level of exposure, then there is a requirement for operators, essentially, to take radiation protection measures for underground workers, for example.

**THE PRESIDENT:** But to your knowledge, you don't know if they actually use dosimetry in some of those mines?

**DR. THOMPSON:** So my understanding from the work of the FTPRPC committee working group is that, when those assessments have been done, they've been sort of in the range where workplace monitoring is sufficient for controlling exposures, so individual monitors have not been required.

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

**MR. LeCLAIR:** Mr. President, if I could just add, perhaps another important consideration is the mining sector, as a whole, has had significant improvements in ventilation standards over the years. Because there's not just the radiological contaminants, ventilation systems in conventional mines have improved significantly over the last decade, specifically to deal with diesel emissions and other contaminants in the work environment.

So air quality in underground mines in general has improved across the entire mining sector, and so that would also equally improve the air quality for things like radon.

**THE PRESIDENT:** Thank you.

Who is -- Mr. Tolgyesi.

**MEMBER TOLGYESI:** My second is I'm

questioning myself also. When you're looking at page 72, and we are talking about Rabbit Lake, for instance, total suspended particulate in air, there are three high-volume air samples. What we are saying -- we don't see how far they are, what's the distance between, but what we are saying that on average they are well below the provincial standards, which is 70 micrograms.

Now what I'm questioning: is it the right way to say that just we used the average? Because if one will be 90 and two other ones will be zero, the average will be 30, which is well below the standards, but we overpassed one. So should we report the average and the maximum which was measured or what we should do? That's my questioning.

**DR. THOMPSON:** Patsy Thompson, for the record.

I'll ask Dr. Nana Kwamena to come up to the microphone. She's our atmospheric expert and she's got a good understanding of how the standards are derived and why this data is appropriate.

--- Pause

**DR. THOMPSON:** If I could, while Dr. Kwamena is getting her thoughts together, you had a question a few minutes ago about toxicity tests for *Daphnia magna*. So we've been involved in the 10-year review of the

Metal Mining Effluent Regulations, and one of the proposals by Environment Canada is to make the *Daphnia magna* test mandatory moving forward, and so we are monitoring that situation.

**THE PRESIDENT:** Just, as you know, in many communities the toxicity of the water around the communities is one of the hottest issues, and when some of those mines do fail a lethality kind of a test to me would seem that would be a real important kind of issue that should share with those communities.

**DR. THOMPSON:** Patsy Thompson, for the record.

The toxicity tests that we've been talking about are for effluent samples, they're not for receiving environment testing.

**THE PRESIDENT:** Okay, but the other --

**DR. THOMPSON:** Okay, yeah.

**THE PRESIDENT:** -- the other table, they are.

**DR. THOMPSON:** Yeah. I agree, yeah.

**DR. KWAMENA:** Hello. Dr. Nana Kwamena, for the record. I'm an environmental assessment officer at the CNSC.

So I would like to pass part of the question with regards to the derivation of the provincial

standard on to the province, as I understand there was someone available in Saskatoon who is from the ministry.

In terms of the appropriateness of taking the average of three samples, I think I would agree with you in the sense that over the time period of which the high vol is there, you are going to see variation in the numbers, and therefore there'll be maximums and minimums that we're not capturing in this number. However, we do see in the Annual Compliant Report something more reflective than just one number, and so we're able to see the performance over the period of a year.

So I hope that addresses that part of the question, but in terms of the derivation of the standard, I'll pass it on to the ministry.

**MR. MOULDING:** Tim Moulding, Saskatchewan Ministry of Environment again.

When we're talking about total suspended particulate matter at these sites as well, most of the data collected in terms is comparing to the other site data, which is one of the reasons why we run background stations and exposure stations at these, and compare them to each other.

First off, you're getting -- the amount of material that you collect on the filters that's available for analysis at the lab is a small amount of material,



collected quarterly. So you're only getting enough of a sample to send off to the laboratory for analysis once every quarter, and then aggregate that over the year as well, to give you an indication of what the concentrations of those contaminants of concern are.

When it comes to air quality, again remembering that you've got a lot of environmental factors that are involved there that aren't necessarily mine-related as well, again I would expect to see a particular matter in certain parts of Saskatchewan much higher in 2015 than it was in 2014 because of all the forest fire activity that we had in 2015 compared to 2014.

So in terms of providing information on the performance of the mine operations with respect to air quality, again because you look across the board at how much lower the actual numbers are compared to the provincial standard, it gives that overall indication that air quality -- suspended particulate matter, quality issues for the Saskatchewan uranium mines, and actually Saskatchewan mines in general in the north, aren't anything that we need to -- are well within the standards that have been set.

**THE PRESIDENT:** Ms Velshi.

**MEMBER VELSHI:** Page 18, of CMD 15-M35, on radiation protection, there's a comment here that where

direct monitoring through dosimeters is not practical or required, there's group monitoring and time cards and so on for coming up with worker dose estimates.

So any sense of what percentage of dose assignments is done by that method, as opposed to direct dosimetry?

**MR. LeCLAIR:** Perhaps we can ask Cameco and AREVA if they might be able to provide that answer.

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

We don't have that information in front of us. We can make attempts to phone a friend here and see if we can get that or report back to staff as we obtain that information.

**MR. HUFFMAN:** Dale Huffman, with AREVA Resources, perhaps just a comment.

While we don't have the exact portion, you should understand that, in giving out dosimetry monitoring devices, we have a strategy based on dose or based on risk, and it would be only the very small doses that we would measure by other means other than direct dosimetry.

So it is the workers that have the very lowest doses that we typically are measuring by means other than direct dosimeters.

**MEMBER VELSHI:** Thank you.

Yeah, if it's really small doses, then I wasn't particularly interested. I just wondered if it was -- because it says it's impractical, and I just wondered whether there's a great margin of error here.

**MR. LeCLAIR:** I just want to assure the Commission we agree with the statement made by Mr. Huffman that, in fact, the dosimetry is assigned based on the higher risks. The worker categories that are the ones that are going to get the higher risks for elevated exposures are the ones that are assigned the direct-reading dosimeters and the dosimetry, the necessary dosimetry.

**MEMBER VELSHI:** Right. Thank you.

So Cameco, you don't need to go through that effort. Thank you.

My second question -- or it's more a comment -- is: on page 40 of the written submission, and it's on environmental spills, it's the choice of the words "reported to the ground." I think you need to change that.

Do you see the sentence? In 2014 there were three events of environmental spills, and it says "radium-226 reported to the ground." Do you mean spilled on the ground?

**MR. LeCLAIR:** That's correct.

**MEMBER VELSHI:** And then similarly for the third one, the 20-litre one.

Thank you.

**THE PRESIDENT:** Is that common lingo, "reported to the ground?" I mean I had the same kind of a reaction to this.

**MR. HUFFMAN:** It's Dale Huffman, with AREVA.

Yeah, it is. It is a common language we would use, "reported to the ground." We might have a upset that reported to secondary containment. And then in processing we're always talking about some fluid reporting to another location in process control. So it's just part of our vernacular.

**THE PRESIDENT:** Well, in laymen's language and to the public, it could be misinterpreted many, many ways.

**DR. NEWLAND:** Agreed. We'll clarify the language.

**THE PRESIDENT:** Okay.

Okay, we're back to Monsieur Harvey.

--- Off microphone / Sans microphone

**THE PRESIDENT:** Dr. McEwan.

**MEMBER MCEWAN:** Thank you, Mr. President.

So back to my comments this morning about the presentation of data, page 42-43, I think Figure 3.8 is a perfect example of how that second reference point really

makes it much easier to understand exactly where an effluence is, or whatever, in relationship to expectations, action levels, and so I really like that and I hope we can look at that for the rest.

If we move to Figure 3.9, radon and ambient air levels have doubled in 2014 compared with the previous years.

Is that purely related to the introduction of mining activities or is it related to some other factor? And would there be a CNSC objective or action level of something that would sit below the reference rate in a graph like that in the future?

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

I might try and answer this presumptively, but with respect to the Cigar Lake radon measurements there was a sample involved there that was compromised and should not have been used in the calculation of that radon mean.

The radon was elevated at one station in the second half of 2014 due to the track-etch cup in question being knocked down by wildlife. Radon track-etch cups are supposed to measure airbourne radon activity and are supposed to be placed at an appropriate height to accurately measure it. So that radon track-etch cup being on the ground for any period of time compromised the

sample.

That being said, even with the compromised sample being included, ambient radon at the Cigar Lake facility was still below the objective.

**MEMBER MCEWAN:** Okay. So, again, that brings me back to, you know, eight monitoring stations are located in four quadrants. So, again, a map would be helpful. And were they near afield? Far afield? Medium field? Is there value in understanding what the sequential changes in ambient levels are as you move further away from the mine?

So, again, I think it would help us understand that.

**DR. NEWLAND:** Thank you for the observation. We'll certainly look at including more details on maps to help the Commission members and the public.

**THE PRESIDENT:** Thank you.

Mr. Tolgyesi.

**MEMBER TOLGYESI:** My last question is: you have two acid plants. They are producing sulphuric acid. What do you do with?

**MR. NAGY:** Kevin Nagy, for the record, with Cameco.

We utilize sulphuric acid as a reagent in

our milling processes, the leaching process predominantly, and we also use it as a reagent in our water treatment processes to adjust the pH of the water that we're treating.

**MEMBER TOLGYESI:** So do you produce enough acid to cover your needs or you should buy or do you produce more than you could use and you sell?

**MR. NAGY:** Kevin Nagy, for the record.

The Cameco facilities -- I won't speak for AREVA, but the Cameco facilities do have the ability to produce enough sulphuric acid for their needs. There have been circumstances where maybe the plant's down for maintenance or other reasons where we have trucked in sulphuric acid for use. We're also in a position where we're able to share sulphuric acid between our facilities.

**MR. HUFFMAN:** Dale Huffman, with AREVA, for the record.

Similar comments from AREVA would be the acid plant is there to supply our needs. We have some flexibility in production, but predominantly it's there to supply the operation of the plant.

Again, the sites prefer to make sulphuric acid on-site and truck in molten sulphur. It's a more benign reagent to transport than sulphur acid itself.

Also at McClean Lake a reagent that we

make on-site is ferric sulphate, and the ferric sulphate is made from iron, iron that we bring to site, and our McClean-produced sulphuric acid.

Thank you.

**MEMBER TOLGYESI:** According to this report, Rabbit Lake operations will end by 2019. Considering that the best place to find a mine is an actual mine site, is there any on-site exploration or looking for to perpetuate the mine operations?

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

As of December 31st, 2014, the proven and probably ore reserves were estimated to provide several more years of operation at the Eagle Point Mine. We're publicly traded, so in that regard -- that's all I can say in that regard.

There is ongoing exploration work at the Eagle Point mine and in the vicinity of the Rabbit Lake mill, so we're sympathetic to that position about finding new mines, and we continue efforts in that regard.

**MEMBER TOLGYESI:** That was exactly my question, so you answer it.

**THE PRESIDENT:** Thank you.

Ms Velshi.

**MEMBER VELSHI:** Again, just a very quick



editing. On page 62, Table 5.1, on mining production data for Rabbit Lake, you haven't included in there the authorized annual production for that table, which you have for all the other facilities. You may want to include that.

**THE PRESIDENT:** While we're looking at this table, can somebody explain to me? You know, we're trying to be consistent. So sometimes you will use tonnes, sometimes you use millions of kilograms, sometimes you use thousands of pounds. I don't even know if the tonnes are metric tonne or British tonne.

So can we agree on -- I don't want to change the vocabulary of the industry, but sometimes mixing all of these in one table really threw me off.

**MR. LeCLAIR:** So just to explain the differences, why the ore is presented in tonnes -- and it's metric tonnes -- and why the uranium's presented in kilograms, the tonnes of ore is substantially greater than the amount of uranium because it's the rock with the uranium in it, so we tend to report it in tonnes, and then the uranium numbers are all presented here in millions of kilograms of uranium as the final product. That's the difference.

So we can certainly present everything in millions of kilograms if it would make it easier.

**THE PRESIDENT:** You just got to make sure that you understand it's -- because I also saw pounds in there, in terms of production, in one of the reports, I can't remember where. So, again, that pounds is not easily related to the kilograms, right?

**MEMBER VELSHI:** No, I've made my comment.

My last question, and it's really for all three parties -- AREVA, Cameco and staff -- to comment on, something that we've seen in other Annual Oversight Reports is areas of regulatory focus, so what are the key challenges or opportunities. So if you sit back and said, Well, now that we've looked at last year, looking forward, I'd be interested to hear from all three of you on what do you see as the biggest challenges or areas of opportunities in the areas that we've looked at today.

So maybe we'll start with staff, then move to AREVA, and then Cameco.

**MR. LeCLAIR:** So I'll begin by saying that we look across all the safety control areas all the time. We actually adjust our Regulatory Oversight Report directly related to the activities that are going on at the actual sites. So if I use -- for example, McClean Lake is getting up, ramping up operations. It sat for five years in a stable state, but -- so this year we focused more on looking at their training programs, because they're hiring

a lot more people.

So we actually adjust our reviews tied to either what's happening at the site or what's being proposed and what's coming down the road. We do get -- we still get applications for things like tailings expansions, which will lead for us to have to do more technical reviews that we'll look at.

The other thing we'll look at -- so, for instance, if we look at the 2014 results, and one I can talk about right now, we look quickly at the LTIs. We have LTI statistics. We had three LTIs at McClean Lake in 2014. Again, as facilities ramp up, we tend see higher risks and the potential for LTIs. So it's an area that we've looked at quite a bit more. So in 2015, that's where we focused.

So it's tied to either what they're proposing or any changes in their current activities, or when we start looking at trending data, and we look at the results of their actual performance, it'll start focusing.

The other thing I should mention is if we -- we also do talk across the organization, so we don't just look at uranium mines and mills. So if we see things from other activities and DNCFR with other facilities that are being regulated that are indicative of potential issues, that'll also be an area that's our focus.

But just to give you -- so I gave you

those few examples of the LTIs, for instance, at McClean Lake, and some of the submissions that we've had and some of the programs we're focusing on.

**MEMBER VELSHI:** Thank you.

And I wonder whether it would make sense to include something like this in the report that's not only reporting on the past 12 months, but, just looking ahead, what are some key emerging issues or priority areas. I think that may be helpful, because I certainly -- I mean what you just shared with us was good to hear.

AREVA, from your perspective?

**MR. HUFFMAN:** Dale Huffman, with AREVA Resources, for the record.

Probably just to follow on to Jean LeClair's comments, yes, at McClean Lake, over 2015 we have been ramping up production. We have been ramping up our production rates and our ore rates and the key focus at our site is to continue to do that while achieving our environmental performance targets, continuing to improve on our safety stats to achieve a zero accident state and to keep doses as low as reasonably achievable while producing at high grade and high tonnage. So it's a new environment for us. I think we are at a fairly successful ramp-up but that's our focus for the future. Thank you.

**MEMBER VELSHI:** Thank you.

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

I will return the compliment from Mr. Huffman from earlier in the meeting. That was well said and equally applicable to our Cigar Lake operation. I would add a couple of broader pieces that are in play.

One is Dr. Thompson referred to the metal mine effluent review that's under way. That is a significant undertaking. It has been going on for quite some time. CNSC staff have been very active, as has provincial representation from Saskatchewan. That's a very important file for us, where they land on the parameters and the different limits that may be introduced.

I would also add that there is work under way under the Chemical Management Plan in relation to selenium. That draft report was issued earlier this year and that's one that we are paying quite close attention to as well, both of those being managed under Environment Canada but different arms of Environment Canada.

That brings me around to probably -- you know, in a room full of regulators I will say it but I won't make myself very popular, and that is in relation to the cumulative regulatory impact. So we have a lot of change, regulatory change, regulatory pressure being brought to bear and changes in the provincial environmental

regime here in Saskatchewan, adapting to that, the MMER change coming into effect when it does. Those sorts of things are increasingly on our minds collectively as we look at compliance issues across the board, not just on the environment but the safety and the radiological as well.

**MEMBER VELSHI:** So on that one, anything that you think we as Commission Members need to hear as far as the CNSC regulatory regime and oversight?

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

I think that we have a pretty healthy dialogue with the specialists in Ottawa and our respective divisional directors around concerns that we have and we do try to be active in relation to the discussion papers and draft REGDOCs that are produced to draw attention to some of those other competing pressures and make sure there is some visibility.

**MEMBER VELSHI:** Thank you.

**THE PRESIDENT:** But on that note, just a question. I was a bit disappointed that there were absolutely no comments from the aboriginal communities on this particular area on your report. As you know, in many of our licensing hearings we have mentioned that the annual report is an occasion for people to share the concern at the community level.

So why in your opinion -- this is for Cameco and AREVA and staff -- why did we not get any kind of comments on this particular annual report?

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

I would hesitate to comment for them. I would point out that we have robust public information programs and numerous points of contact with our northern stakeholders, whether it be through the Environmental Quality Committees or the Athabasca Working Groups, Eastern Athabasca Regional Monitoring Program, the outreach there.

I think that, you know, the survey results show strong support. I think our annual polling results showed 77 percent of Saskatchewan residents supported the continuation of our operation. So with that sort of backdrop, I would see this as one window and there are plenty of other opportunities that we provide through our programs for those communities to participate and understand what our facilities -- what our plans are and how our facilities are performing.

**MR. LeCLAIR:** Jean LeClair for the record.

For CNSC staff, just to complement what Mr. Mooney said, I think maybe it's a reflection that we do actively engage with the communities. We are very engaged. I think we laid that out in Northern Saskatchewan. There

are very established mechanisms.

In fact we always make ourselves available. People can call us in the office. They can talk to us quite regularly. I think a lot of the communications are done through that. We have that environment, a quality committee where we are actively involved, and perhaps it's a reflection that people are -- and again we can't speak for them but I would say that we are very actively involved with them and we keep them quite informed. And generally, if you look at the approval ratings in Saskatchewan, it's certainly an indication that overall conditions are fairly healthy.

But we are always looking for opportunities. We are always engaging them and that's why through the presentation we did talk about some of the things that we are doing to continue and engage them and give them an opportunity to talk to us and share with us.

I mentioned it already, that in fact we are going to the Environment Quality Committee in mid-October and we are going to go over the Regulatory Oversight Report with community representatives. We will be spending a couple of days with them in La Ronge going over the results. And often that's where we can get a lot of dialogue going and we can certainly get into discussions with them. So I assume that is part of they are satisfied



that they are having an opportunity to talk to us.

**THE PRESIDENT:** Okay.

Anybody? Any other questions, comments?

I just have two. First of all, I already complimented you, I think, on your Appendix E I believe, that shows all the decommissioning. I also like in one place, in Appendix D, to see the financial guarantees and I assume that -- I always have to ask that question on an annual basis. There are sufficient funds to take us all the way to the end game, right?

**MR. LeCLAIR:** So financial guarantees are definitely sufficient based on the preliminary decommissioning plans that are routinely looked at. I have to say for the mines probably their preliminary decommissioning plans are updated perhaps even more frequently because they are very active and often are constructing and changing things. So these are reviewed, updated regularly and at a minimum every five years the decommissioning plans are relooked at and the financial guarantees are reassessed.

So yes, I believe they are adequate and will continue to remain adequate.

**THE PRESIDENT:** And my final is a reminder. You know that we have had two intervenors. They are the same intervenors that we had in part one of this

morning session and one from Ms Carolyn Johnson and another one from the Canadian Nuclear Workers' Council. Just for the record, are there any other questions to these two intervenors?

Ms Johnson, I think we dealt with the Mount Polley disaster. In fact she was very happy to hear that it was being looked after. So I don't know if anybody wants to add any question to that.

And any final comments on the Canadian Nuclear Workers' Council?

Okay. So in that case this concludes the public meeting for today.

The meeting will resume tomorrow at 9 o'clock, but in the meanwhile the Commission will consider the public hearing regarding the Gunnar Mine Remediation Project at 4 o'clock this afternoon. So we are right on time.

Thank you.

--- Whereupon the meeting adjourned at 3:45 p.m., to resume on Thursday, October 1, 2015 at 9:00 a.m. /  
La réunion est ajournée à 15 h 45, pour reprendre le jeudi 1er octobre 2015 à 9 h 00