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**MR. CASE:** No. The plan has been presented since the early days of the presentation of the project. So from even our conceptual designs back in the early licensing periods, this has all been clearly presented.

**THE PRESIDENT:** So just to finish with the list, 13, 14 and 15, I would just like to hear that the two regulatory bodies are doing their job. I think that's what the recommendation is. Go ahead.

**MR. THELEN:** John Thelen for the record.

Before we do pass it on to MOECC as well as Environment and Climate Change Canada who is here today, I just wanted to indicate that a space has been made for MOECC and Environment Canada to meaningfully provide regulatory oversight.

CNSC, MOECC and Environment and Climate Change Canada meet regularly, including onsite meetings to tour the facilities, tour the wastewater treatment plants and get progress updates on activities that are occurring at the Port Hope Area Initiative with respect to all of our regulatory jurisdictions, looking for areas of overlap where we can work synergistically together on those areas and being transparent where there is no overlap, where we

do have a regulatory role to ensure that we do enforce and deal with regulatory oversight that has been provided through the CNSC licence.

**THE PRESIDENT:** We want to hear those environmental people on the record telling us what is the expectation of managing this particular project. Why don't we start with Ontario.

**MR. BRADLEY:** Sure. Thank you very much. David Bradley for the record.

We have been quite involved, as CNSC has mentioned, throughout this project in the joint regulators' meetings. We have met regularly with CNSC staff as well as Environment Canada and Climate Change staff.

Throughout the project over the last few years we have reviewed numerous reports through the PHAI project, including some of the property survey reports where there is non-low-level radioactive waste that has been identified. We have been involved in reviewing the trial site remediation. We have also been involved in providing comments on effluent criteria and will continue to be involved in that process as well.

I do see our involvement increasing as the project moves forward. There are a number of approvals that will be required for certain aspects of the project. Environmental compliance approvals for the Highland Drive

landfill site will be required from the Ontario Ministry of the Environment and Climate Change. There may be other environmental compliance approvals required as well. And another example, there may be permits to take water that would be required from the Ministry of the Environment and Climate Change, you know, for dewatering as site remediations continue to happen.

**THE PRESIDENT:** Environment Canada...?

**MS ALI:** Nardia Ali for the record.

As the MOE has said, we participate as well in the joint regulatory groups and we review reports and we have input into determining what are the criteria that are monitored.

So some examples, and I can ask staff to give more detail, but we have reviewed criteria that should be looked at I guess with the dredging, so we provide input into things like that. So we are all engaged.

One thing that I think would be useful is, after we have those meetings, if there is some reasonable period, if those are made public, I mean, it kind of shows how we arrive at some of those decisions, that would probably be a good thing to make public.

**THE PRESIDENT:** I understand in some of the presentations there is a standing regulatory committee that meets frequently with all the players. It would be

nice if some major decision was shared publicly going forward.

**MR. THELEN:** John Thelen, CNSC staff for the record.

It's our expectation, using regulatory oversight reporting to inform the Commission on an annual basis, precisely that any major findings or issues faced by the joint regulatory groups so that you and the public can be assured that that ongoing cooperation with these regulators is continuing as the project proceeds.

**THE PRESIDENT:** Thank you.

Anything you want to add?

**MEMBER MCEWAN:** I just want to go back to the dredging because it seems to me that this is probably -- there is a high risk of something going wrong with that.

So you have skirts around to prevent sedimentation through the water. At the end of the process, will the water then be somehow re-evaluated to see if there is significant residual sediment left in it or precipitants, whatever they be, left in it that would still pose some risk or some possibility of environmental risk?

**MR. CASE:** Glenn Case for the record.

The dredging operation is going to be taking place in two phases. The first phase is the

conventional cutterhead suction dredging that removes the bulk of the waste. Then there is a follow-up second pass that's almost like a vacuum cleaner that vacuums the bottom and we are very fortunate that we do have such a hard bottom of bedrock to work with. So that in fact removes any of the residual sediment and we have a remediation verification program that will be in place to verify that we have removed all the sediment from the harbour bottom.

**MEMBER MCEWAN:** So at the end of that process you will be left with drying sediment on the pier? How long before that can then be removed?

**MR. CASE:** Glenn Case for the record.

The removal of the sediment will be an ongoing process. These geotubes are very large in size and will allow us to separate the water from the sediment. They will be removed on an ongoing basis and transported to the long-term waste management facility.

As I said at the beginning, we have 120,000 cubic metres of material to remove from the harbour. So it's an ongoing process of dewatering, removing of the sediment, setting up new geotubes to receive new sediment and slurry from the harbour.

**MEMBER MCEWAN:** Just out of interest, how long does that dewatering process take?

**MR. CASE:** It probably will take several

weeks per bag, because the way it works is it comes in in layers, dewater, another layer, dewater, until it builds up. These bags are 10 feet wide, 50 feet long and can be upwards of 5 to 6 feet in height, so they are quite large and there will be many of them.

**THE PRESIDENT:** So what is the end design objective for the water? Is it swimmable? I'm trying to figure out what's the long-term objective for this particular facility?

**MR. CASE:** Glenn Case for the record.

The long-term objective for the remediation of the harbour is such that all of the contaminated sediment will be removed so there will be no concern in the future about future dredging, should that ever need to take place. That is the objective of the cleanup of the harbour itself. Now, in terms of the swimmability of the water, it will be lake water that will be in the turning basin.

**THE PRESIDENT:** Okay.

**MR. RULAND:** I have to say I'm not at all reassured by what I heard here. You will have gathered from my report that I gave this project the best most detailed review I could possibly give it and I looked hard for any plan that described how water in the Port Hope Harbour was going to be managed during all the dredging

exercise. I don't have concerns about how they are going to manage the sediment that they are scooping up from the bottom in those geotubes. That is not my issue. My issue is the Port Hope Harbour is one of the 43 most contaminated spots on the Great Lakes and as they get in there and disturb those sediments the water in the harbour is going to be very, very dirty.

What I heard today for the first time -- I went on two tours through the area there, one with people from Cameco and one with people from the Port Hope Area Initiative. Nobody mentioned anything about a porous barrier at the end of the harbour and I have seen no sketch, no design, there is no description of this "porous barrier." What a porous barrier means to me is that water is going to be allowed to leak through and into the lake from what is going to be a very, very messy cleanup site and I have to say I'm gravely concerned by what I'm hearing here if that is in fact the plan and I sure would appreciate details.

**MEMBER MCEWAN:** So can I just try and understand. You're concerned about the water quality degrading during the cleanup process and escaping into the lake?

**MR. RULAND:** Yes.

**MR. CASE:** Glenn Case for the record.

We should clarify that at the mouth of the harbour we are installing a wave attenuation system that isolates the harbour so that we can do the dredging in a controlled manner. This control -- and in advance of that or just slightly upstream from that wave attenuation system is a silt curtain that will attenuate the suspended salts from moving into the lake.

The work itself is conducted in a controlled manner within a shrouded suction dredge configuration so that we don't have what is described as widespread contamination throughout the harbour. It's a very controlled process that we are going through in terms of the removal of the sediment to avoid exactly what has been described in terms of the widespread spread of contamination in the harbour.

**MEMBER VELSHI:** So while the harbour is getting cleaned up, is the sampling frequency going to increase in Lake Ontario at the outfall of the harbour? To confirm what you're planning on doing and it's meeting your expectation.

**MR. CASE:** Glenn case for the record.

At this time the sampling -- our program would be focusing on the quality of the water being returned to the harbour. At this time we currently do not sample in Lake Ontario downstream of a harbour area.

**MEMBER VELSHI:** Should you be? Or maybe I should ask staff that.

**MR. THELEN:** John Thelen for the record, with an emphatic yes. The environmental monitoring program requires the protection of the environment. When activities such as harbour remediation are going on, enhanced environmental monitoring that was identified during the EA phase of this project would kick in.

So there are requirements such as mitigation measures to make sure, exactly what Lake Ontario Waterkeeper has mentioned, that contaminants during this activity will not leave the harbour and reach out into Lake Ontario. The water quality in Lake Ontario would be protected and the contaminants that are in the sediments are collected and removed from the harbour and not released further into Lake Ontario or into the environment.

Much was mentioned yesterday as well. The activities that are being done near Centre Pier and harbour work will require enhanced monitoring pre and post and during to make sure that the contaminants are being collected, isolated and transferred to the long-term waste management facility.

**THE PRESIDENT:** So who will do this monitoring right at the mouth of the lake to make sure that nothing escapes into the lake? Who is going to do this?

Is it going to be CNL, CNSC or both, Ministry of Environment? I want to understand who actually makes sure that what we are planning actually gets executed?

**MR. THELEN:** John Thelen for the record.

I will start first by discussing the requirements of the licence and then I will pass it back to Director Kiza Sauvé who can speak to IEMP requirements or expectations.

Yes, environmental monitoring will be conducted by the licensee that is conducting the work. So in the case of harbour dredging, during that activity, CNL will be obligated to ensure that the contamination is being controlled and that surface water in Lake Ontario is not being affected by those operations. That's done by the licensee, but other independent sampling is also expected and I will ask Ms Sauvé to answer that.

**MS SAUVÉ:** Kiza Sauvé. I am the Director of the Environmental Compliance and Laboratory Services Division.

Our Independent Environmental Monitoring Program has already been sampling in the harbour and at the mouth of the harbour and upstream and downstream from the conversion facility and so during this cleanup program we will be designing our Independent Environmental Monitoring Program around the cleanup activity. So we have already

done the pre-sampling and we will ensure that we do the during-sampling and some post-sampling as well.

**THE PRESIDENT:** But again, the dredging is going to be an ongoing, almost daily activity. Somebody has to do the sampling almost at the same frequency to make sure that there is really no outflow. So I'm not sure it's you that's going to do this. I still think it's going to be the licensee, CNL.

**MR. HEBERT:** Craig Hebert for the record.

The general design concepts and processes that are planned to remediate the harbour, as Mr. Case described, have been fairly well developed. In my earlier presentation I indicated that the harbour remediation is currently scheduled to occur later in 2018.

As we get closer to that date, we will put greater design detail with respect to actual contractor requirements. This will be a contracted activity. And in conjunction with that, we will be developing further details with respect to environmental monitoring plans in conjunction with the CNSC and other regulators to add the required detail to make sure that regulatory requirements are met, health, safety and the environment are thoroughly protected.

**THE PRESIDENT:** Thank you.

**MR. THELEN:** If I could just add to that.

John Thelen for the record.

Just to make it clear that ongoing environmental monitoring is a requirement of the licensee and CNSC staff will continue to verify that that monitoring is being done, that the environment is being protected and inform the Commission of those activities.

**THE PRESIDENT:** I'm just reacting. Ongoing can be once a year, twice a year or daily. When you do those kinds of activities, you have to have a higher frequency here.

**MR. THELEN:** Correct.

**MR. RULAND:** Wilf Ruland for the record.

I just want to state that I don't believe there is currently a monitoring plan for Lake Ontario downstream of the harbour mouth. I think you have heard a lot of reassurances. If there is a plan, I would very much appreciate if people could bring it to my attention and give me a copy so I can review it for Waterkeeper. I could not find one. I don't believe there is one.

**THE PRESIDENT:** I thought I just heard that as they get closer to 2018 there will be more and more design, but I don't know if there is now an existing plan. But there is monitoring. I thought I just heard CNSC saying that they are monitoring -- did I miss something here -- or Ministry of Environment.

**MR. RULAND:** I believe what you heard was that they did their pre-dredging monitoring just to establish background levels and now they have stopped. My concern is once dredging is happening, it's vital that we be monitoring that lake, as you say, very frequently, daily as appropriate, and I don't believe there is any plan to that effect right now.

**THE PRESIDENT:** Go ahead.

**MR. BRADLEY:** David Bradley for the record.

We would agree that there needs to be a robust monitoring program in place and, you know, the Ministry of the Environment and Climate Change would want to review any of those plans before work actually happens and comment on those plans, and there also might be approval requirements under the provincial *Ontario Water Resources Act*. So these are plans we would definitely like to see well before any work starts.

**THE PRESIDENT:** Do you have to satisfy or authorize the dredging? Who actually -- is there a licensing requirement for dredging? Anyone?

**MR. HEBERT:** Craig Hebert for the record. I believe that would come under the jurisdiction of Department of Fisheries and Oceans.

**THE PRESIDENT:** So they are going to be

part of your little team; right?

**MS MURTHY:** Kavita Murthy for the record.

Yes, Environment and Climate Change Canada and Fisheries are federal partners with whom we have ongoing exchanges of information and memorandums of understanding.

**THE PRESIDENT:** Presumably, they will set up some requirement about how to do this also. Go ahead.

**MS FEINSTEIN:** Pippa Feinstein for the record.

In my review of the PHAI documents and on site visits as well, I was able to discuss DFO permits with PHAI management and it was discussed that for some of the newly constructed access roads to the waste management facilities permits were required for the compensation of fish and fish habitat that was destroyed by the roads and that did take place.

So my question is: Is a DFO permit also in the process of being obtained for the dredging activities specifically and does that require compensation or does it require specific mitigation? What's the status with a permit for the harbour and dredging specifically?

**THE PRESIDENT:** Go ahead.

**MR. HEBERT:** Craig Hebert for the record. Ms Faught has some greater clarity on that topic.

**MS FAUGHT:** Thank you.

Sandra Faught for the record.

So CNL will be conducting a review, basically a self-assessment as outlined in DFO Projects Near Water. Based on the results of this self-assessment, we will be working with CNSC staff through their Memorandum of Understanding with Department of Fisheries and Oceans to determine whether or not we need *Fisheries Act* authorizations and permits for the work in the harbour as well as a few other locations. It's not just the harbour that we will be having an effect on water.

**THE PRESIDENT:** Well, we discussed this in the last few days. I assume that you are very close now to making a decision.

**MS MURTHY:** Kavita Murthy for the record. I will ask Dr. Caroline Ducros to respond to the question.

**DR. DUCROS:** I just want to bring this back to the comprehensive study that was done under the *Canadian Environmental Assessment Act* where Fisheries and Oceans at the time were federal authorities, an expert authority on these activities. We were waiting for more detail and we will get the self-assessment works in the harbour.

Until I see what the self-assessment says, DFO traditionally has used standard operating procedures to

avoid serious harm and to avoid the need for a permit. There are other areas where *Fisheries Act* authorization may be required, but we will work with DFO once we have the self-assessment.

**THE PRESIDENT:** I just want to be very clear. I thought you already had the self-assessment and you were reviewing it.

**DR. DUCROS:** That was for the Port Hope Conversion Facility intake. That was --

**THE PRESIDENT:** Okay. So that's a different one?

**DR. DUCROS:** That's different, yes.

**THE PRESIDENT:** So you will have to go -- you couldn't get for the whole waterfront kind of assessment?

**DR. DUCROS:** Well, one was from Cameco and one will be from CNL.

**THE PRESIDENT:** Okay. So when is that due?

**MR. RAVISHANKAR:** Ravishankar for the record.

These self-assessments will be conducted before the activity starts and so that hasn't started. There are six different large-scale sites where we will be conducting these self-assessments.

**THE PRESIDENT:** Okay, thank you.  
Anything else you want to raise? Go ahead.

**MEMBER MCEWAN:** On this?

**THE PRESIDENT:** On everything. We have to move on.

**MEMBER VELSHI:** Yes. So Recommendation 15, and I guess that's for CNL to comment on.

**MS FAUGHT:** Sandra Faught for the record. Currently on our PHAI website we are posting weekly results from our dust monitoring. As mentioned earlier, we have summaries for our annual compliance reports posted on the website, with results available to the public upon request. We also do have real-time weather monitoring data on the website. As you know, weather is quite important to our construction activities, so that is something that we keep a close eye on.

**MEMBER VELSHI:** And when you have reportable incidents, do you post them on your website in a timely manner?

**MS FAUGHT:** Sandra Faught for the record. Under the Public Disclosure Policy there are incidents that do require public disclosure. In those cases we do post those on our website and our goal is as

quick as possible but no more than four days. As Craig mentioned in our presentation, we have posted one public disclosure on our website earlier this year and that was related to a pipe break event at the Port Granby facility.

**MEMBER VELSHI:** Thank you.

**MEMBER MCEWAN:** So this is I think probably relevant at this stage to ask this question. If I look at -- this is the October 25th slide deck from CNL, Slide 15.

As I look at the existing sites of contamination that need to be moved to the new long-term facility, it's very, very close to the bluffs. Is there a risk of those digging activities as you remove that waste of leaching or contamination going down the bluffs into the lake at that point?

**MR. HEBERT:** Craig Hebert for the record.

I will ask Mr. Galanter, the Manager of the Port Granby Project, to comment further, but there is certainly a bluffs monitoring program that is currently in place to keep track of stability and get early warning of any instability with respect to the bluffs. And included in the contractor's work programs are ongoing slope stability measures that Mr. Galanter can talk about in a little more detail.

**MEMBER MCEWAN:** So I guess my question was

about stability and leaching. Are you likely to get increased leaching with the digging activities?

**MR. HEBERT:** Again, Mr. Galanter can I think address that as well, but with the removal of the source material there still will likely be some hydraulics -- the groundwater flowing through the area will continue to flow through the area. With the removal of the source materials, contamination loading in that groundwater movement will greatly reduce.

**MEMBER MCEWAN:** Thank you.

**MR. GALANTER:** Mark Galanter for the record.

There are detailed water management plans provided by the contractor that have been reviewed and accepted by CNL. There will be sheet piling to prevent the movement of water. Water will be collected and sent for treatment at the water treatment plant.

**MR. THELEN:** John Thelen for the record.

If we could just add to that as well. So not only leaching, groundwater and any water that collects within the remediation excavation zones as well. The expectation is through environmental monitoring and through active work by the contractor and CNL to make sure that any water that's contaminated is taken from that area, pumped, treated by the wastewater treatment plant so there is no

release, uncontrolled release to the environment.

**THE PRESIDENT:** I think we covered a lot of territory, so you have the last word here.

**MS FEINSTEIN:** Thank you to the Commission. I am still gathering my final thoughts. I found this discussion helpful.

But first, well there are a number of concerns and issues I would like to raise and my understanding is that Mr. Ruland will also raise some when I'm finished.

The first concern is that design objectives need to be explicitly included in the licences for these facilities and that over the course of the next year action levels need to be set in consultation with Environment Canada, the Ontario Ministry of Environment and Climate Change and the DFO to make sure that action levels comply with all regulatory limits, that all the metals that are being tested for be explicitly delineated as well and made available to the public, as well as all contaminants of potential concern.

With regards to plans for dredging in the harbour, I would like to stress also that these plans for monitoring and contaminant containment be shared with the public as well as the Ontario Ministry for Environment and Climate Change.

As has been requested so far in this hearing in this discussion, my understanding is that a DFO permit may be required for -- it's very likely that it will be required for these dredging activities and my understanding is, after this discussion, that the process for assessing whether a permit would be required and to obtaining a permit will be initiated soon. No timeline has been given, so Waterkeeper would recommend that this happen immediately and it's a concern that it hasn't already taken place.

With regards to the continued involvement of the provincial Ministry of Environment and Climate Change, in determining effluent criteria for the site, I heard during the hearing that it's expected that ECAs, environmental compliance approvals, and permits to take water will likely be required from different parts of the PHAI program. Again, no timeline has been given for this, so Waterkeeper would recommend that the process to obtain ECAs and PTWs be initiated immediately and that the public be involved in the processes for obtaining these approvals.

Waterkeeper would also support Environment Canada's recommendation that meetings between the joint regulatory group be made public so that Waterkeeper and other members of the public can be kept abreast of the decisions that are being made by this regulatory group, as

well as hopefully notes from meetings and discussions that are happening between these regulatory groups, because that process is very opaque at the moment.

With regards to the reporting of incidents as well as the sharing of data from ongoing monitoring plants, I would like to draw the Commission's attention to the detailed list of recommendations we have for improving how these things are currently being done by the PHAI. While some reports are being -- while some incident reports are being shared with the public, I believe there is currently one on the PHAI website, an explicit requirement for the PHAI to publicly report all spill release events that would be reportable to the CNSC and the provincial Ministry of Environment and Climate Change should be required.

Additionally, real-time data monitoring should be included on the PHAI website's webpages for monitoring. We heard that currently weather updates are shared with the public on these webpages. Other types of monitoring should be as well. This monitoring is being done, so PHAI does have access to the results. They should be shared with the public.

I do have one last point that I would like to make before passing the microphone on to Mr. Ruland and this concerns the importance of monitoring in the context

of the PHAI, which is a GOCO, government owned and contractor operated. My understanding of these types of arrangements between government and private contractors is that accountability and liability is shared between these contractors and government. So in that context, monitoring is especially important to ensure that the contractors are being held to the same standards that the government would be required to be held to.

There is a brief mention in CNSC staff update report about some readjustments or reconfigurations of the ownership of CNL and management of the PHAI. It's Waterkeeper's understanding that while CNL is owned by AECL, that certain parts of CNL have been sold to SNC-Lavalin, Rolls-Royce, CH2M Hill and others who are the contractors implementing much of this project. Some clarification of exactly how liability is being shared about this as well as ways to ensure that contractors are meeting the requirements for transparent operations throughout the project, that would be really appreciated by Waterkeeper.

I think those are all of my closing comments for the moment.

**MR. RULAND:** Wilf Ruland for the record.

So overall I'm satisfied with the responses to 10 of the 12 recommendations that I had made

to the Commission through my report. I am gravely concerned about the activities in the harbour. I think that is the weak link right now. I'm not concerned about the long-term waste management facilities or the wastewater treatment plants, but I don't believe there is a plan in place right now for managing the contaminated water in the harbour. I think it is being developed and I would like to see it once it's done.

My final recommendation had been made on the assumption that the harbour was actually going to be sealed off, with no flow of water out of the harbour, and I said in that event, monthly sampling in Lake Ontario would be appropriate. What I'm hearing now is that the plan seems to be evolving towards an ongoing flow of water from the harbour into the lake during the time where dredging is happening. If that's the case, then I would like to amend my recommendation number 12 to recommend that daily monitoring be done in Lake Ontario for all contaminants of primary concern that have been identified for the Port Hope Harbour. The results of that should be made publicly available on an ongoing basis.

Thank you.

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

Just to remind everybody that we will get

continuous updates on this on an ongoing basis, on an annual basis.

I would like to move now to the written interventions. Marc, you will take us through this.

**MR. LEBLANC:** Yes. What I will do is I will read the reference to each of those written submissions and then ask if the Commission Members have any questions.

We are still trying to reach one of the intervenors and if we are not able to reach him by the end of this session, we will then treat it as a written submission.

**CMD 16-M44.2**

**Written submission from**

**Port Hope & District Chamber of Commerce**

**MR. LEBLANC:** So the next submission is from the Port Hope and District Chamber Of Commerce in CMD 16-M44.2.

**THE PRESIDENT:** Go ahead.

**MEMBER MCEWAN:** So I'm interested in the public portal that is being developed and how that will be regularly maintained and updated. Is there an opportunity for a two-way flow of comments and information requests?

**MR. HEBERT:** Craig Hebert, for the record.

The contractor portal that is referred to is an initiative of the Chamber of Commerce that we have helped to support, and certainly encourage, and understand is very successful; however, it has been very successful both not only from the contractors perspective, but local businesses.

I believe Sarah Anderson, our section head for Stakeholder Relations, can provide further detail.

**MS ANDERSON:** Yes.

Good morning. Sarah Anderson, for the record.

We have been working with the business community on an ongoing basis. We have a Business Communications Working Group that meet a few times a year. The efforts of the Chamber of Commerce have been a combined effort with the municipality to ensure that there is a one-stop shop, essentially, for our contractors to connect and plug into the local business community. Suppliers from a range of services, whether it's contracted services, like construction services, or hospitality, anything from landscaping to catering services, they're encouraged to register on the portal, and, in fact, network among each other, to establish consortiums where they may have an opportunity to bid on some of the, I guess, secondary

contracts that the prime contractor will be subletting out.

**MR. LEBLANC:** The next submission is from Cameco Corporation, CMD 16-M44.3.

Madam Velshi.

**CMD 16-M44.3**

**Written submission from Cameco Corporation**

**MEMBER VELSHI:** In our discussions over the last couple of days with Cameco's licence for the Port Hope Conversion Facility, one of the items that came up was the interface with PHAI, and what in your agreements addresses potential issues of disagreement and other dispute resolution processes that have been clearly delineated. What we heard from Cameco is, you know, we have a great relationship, but there is nothing that has been set up. I wanted to get your perspective on that. Is now a good time to outline that, just in the event that you do get into any disagreements that a process is well defined and it can be done in an efficient manner then?

**MR. HEBERT:** Craig Hebert, for the record.

As was indicated during the Cameco hearing over the last few days, we have a very strong and positive working relationship with Cameco. Our projects interface significantly, obviously, in and around the harbour area

and other adjacent lands. There are specific agreements being put in place between Canada and Cameco with respect to the execution of some of those works, and the receipt, again, of the 150,000 cubic metres that will come to the long-term waste management facility.

As those agreements are finalized between Cameco and Canada, with CNL's assistance, as Canada is essentially a contractor on the project, we'll make sure that there's avenues available to the parties should disputes arise.

**MEMBER VELSHI:** Right. But my question was: has that process been formally delineated? I mean in your presentation, you talk about what you have with the municipalities, for instance, on how you go about resolving differences. Do similar mechanisms exist between you and Cameco, and is Canada, you know, the mediating party, for instance?

**MR. HEBERT:** Craig Hebert, for the record. We have a framework dialogue established with Cameco right now, in terms of how we interface and at what levels. As I had mentioned previously, we collaborate and interact on a technical level, regulatory level, senior management level, and communications and those sorts of things.

In terms of the Municipality of Port Hope,

the dispute resolution process is an element of the legal agreement between Canada and the municipality, and, as indicated a few moments ago, as agreements with Canada and Cameco are further advanced we will make sure there's similar dispute resolution provisions in those agreements should the eventuality arise.

**THE PRESIDENT:** I think I'll wait for the -- we're going to revisit this issue in the next two submissions here.

**MR. LEBLANC:** The next submission is from the Canadian Nuclear Association, in CMD 16-M44.4.

Any questions from the members?

**CMD 16-M44.4**

**Written submission from  
Canadian Nuclear Association**

**MR. LEBLANC:** The next submission is a written submission from the Municipality of Port Hope, in CMD 16-M44.5.

**CMD 16-M44.5**

**Written submission from the  
Municipality of Port Hope**

**THE PRESIDENT:** This is where I thought this discussion about dispute resolution is not about the legal dispute resolution, but all kinds of other issues that may come up, not only between you and Cameco, but you and the municipality and citizen groups. We had a discussion, a long discussion, about Port Hope -- what is it called? -- the West --

**MR. LEBLANC:** The West Beach.

**THE PRESIDENT:** -- the West Beach, and I have no idea what the status is, whether it is a contaminated site. I didn't see it on anybody's plan. So you and Cameco and the municipality and citizen groups, how do you deal with issue like this, rather than everybody -- and not to mention AECL maybe even in there, so lots of players. What's the mechanism to resolve issues?

**MR. HEBERT:** Craig Hebert, for the record.

You are correct, there are multiple stakeholders involved in virtually every aspect of PHAI, which keeps it extremely interesting and challenging at all times.

Specifically with respect to interfaces with the municipality, Cameco and ourselves, as was mentioned through the previous day's proceedings, there is regular meetings between Cameco, ourselves and the municipality to discuss and inform each other of, you know,

where our projects are at, where our activities are at, and those sorts of things, and discuss matters of mutual concern and interest. That process is ongoing.

With respect to the remediation of the West Beach, we know there is historic low-level radioactive waste in that area. It is part of our ongoing property radiological survey to confirm the nature and extent of that. That work is planned to occur in the not-too-distant future, and at such -- and then eventually remediated when remediation activities begin in 2018.

Cameco is aware of that timing, and is working, as I think you heard yesterday, with the municipality on the eventual construction of the access road after that.

So those are some of the sequencing things, as an example. There are other areas throughout not only the waterfront area, involving Cameco, but throughout the municipality involving ourselves and MPH that are under active and ongoing discussions.

**THE PRESIDENT:** Just so I understand, you feel that it's your responsibility to clean the Port Hope West Beach? And if the answer is yes, then how does it relate to -- when somebody wants to build a road, do they have to come through you and get a permit to do this because you can disturb some legacy waste? How does it

work?

**MR. HEBERT:** Craig Hebert, for the record.

Yes, there is known contamination on the West Beach area that is -- and when I say "contamination," I'm referring to historical low-level radioactive waste, as defined, from the former Eldorado operations. Should development need to or be proposed to take place before remediation occurs, then the Low-Level Radioactive Waste Management Office operates an interim waste management program, where remediation would occur in a defined area that might be the subject of a development proposal.

Whether it's a home renovation on small-scale sites or a municipal program, a road reconstruction, for example, the low-level office does do pre-surveying on a municipal project, for example. If there's low-level radioactive waste present that would interfere or affect the municipality or a homeowner's opportunity to complete those improvements, then Canada, under that program, completes the remediation in advance of the development.

In the case of the West Beach, as I described, the planned sequence is that we will begin the remediation in 2018 of that area so that subsequently Cameco and the municipality can complete that roadway.

**THE PRESIDENT:** All of this goes to what I

think Ms Velshi was, you know, arguing for: having some formal mechanism to get a dispute resolution, I would argue.

Okay. Ms. Velshi.

**MEMBER VELSHI:** Thank you.

In your presentation, you talked about the Port Hope Municipality and the outstanding issues are the ones you've resolved. Is there something similar with Clarington for Port Granby?

**MR. HEBERT:** Craig Hebert, for the record.

The legal agreement between Canada and the municipalities are signed. It's the same agreement that's signed by all three parties, being Canada, and AECL represents Canada in that regard, the Municipality of Clarington and the Municipality of Port Hope. So the dispute resolution provisions in that agreement do equally apply to both municipalities.

**MEMBER VELSHI:** Whereas in your presentation you identified a whole lot of issues, those that have been resolved and under discussion, there isn't anything with Clarington, then, or for the Port Granby Project?

**MR. HEBERT:** Craig Hebert, for the record.

That is correct.

**MEMBER VELSHI:** Thank you.

**THE PRESIDENT:** Dr. McEwan?

**MEMBER MCEWAN:** So I was interested, in particular, in two parts of the Mayor's letter. One relates to the discussion around the industrial sites, which are not low-level waste, but which relate to industrial waste. I think it seems to me a valid concern that it will get forgotten as the focus is on the long-term radioactive waste.

Do you have a mechanism in place to -- if I look at the mayor's last paragraph relating to 8, there is sort of a clear and explicit concern that this may be pushed to the back, and certainly in our tour those sites are widely spaced and they're fairly evident. So it is in the plan, and there is at this moment no reason for concern it'll be delayed?

**MR. HEBERT:** Craig Hebert, for the record.

That is correct. We are under very active discussions with the municipality in terms of the scope and scale of the specific remediation that will go on on those particular properties. It is our expectation that we will complete those remediations within the time frame of the overall phase 2 PHAI program.

**MEMBER MCEWAN:** I guess one of the questions that came up again from our tour yesterday: is there likelihood that there could be any other significant

either low-level sites or industrial sites that haven't yet been discovered?

**MR. HEBERT:** Craig Hebert, for the record.

Mr. Case can comment further, but there's, we believe, very little likelihood of discovering historic low-level radioactive waste deposits of any significant magnitude that we don't already know about.

In terms of industrial sites, the legal agreement specifies five specific industrial sites, and those would be the only ones that would be included in our program.

In terms of historic low-level radioactive waste investigations that have gone on in the past that have informed our 1.2-million cubic metre estimate, I'll ask Mr. Case to describe those.

**MR. CASE:** Glenn Case, for the record.

We do not expect to find any additional waste occurrences that we are not already aware of. This is based on an investigation that we did in 2001, where we had a very sophisticated radiation detection system carried by a helicopter that traversed the entire 18-kilometre by 5-kilometre areas that encompasses the Port Hope Area Initiative to see if there were any outstanding areas that we weren't aware of.

That equipment was then transferred to a

vehicle and was driven throughout the roads of Port Hope to see if there were any sites that we weren't aware, and through that investigation there were no sites that we didn't already know about.

**MEMBER MCEWAN:** Thank you.

And then, I guess, relating to number 6 in the Mayor's --

**THE PRESIDENT:** Before you leave number 8, though, there was a comment here about that there was no confirmation that the PHAI is conforming to the MOE requirement for industrial remediation, so maybe I can here from Ontario. How deeply are you into reviewing all those industrial sites?

**MR. FAAREN:** It's Greg Faaren, with the Ministry of the Environment and Climate Change, for the record.

Our understanding is that most of these industrial sites will be redeveloped as more sensitive land use, residential land use in many cases. These sites may fall under our record of site condition regulation, which is a very prescriptive process on how the sites have to be investigated and remediated, and ultimately verified that they can be redevelop for -- reused as residential properties, and that will be, again, under our regulations.

**THE PRESIDENT:** Thank you.

Mr. McEwan?

**MEMBER MCEWAN:** So number 6, I'm presuming the concerns that the major raises in number 6 is related to the mediation that is ongoing. Will the Commission be -- if, when and as it is resolved, do we get confirmation of this resolution, and are you sort of top of that medication process?

**MS MURTHY:** Kavita Murthy, for the record.

The remediation process is a confidential process between AECL and the municipality. We will, however, ensure that whatever the land use -- whatever the outcome of it is, we will be looking to our licences and to the *Nuclear Safety and Control Act*, and the requirements under that act, and the licence, to make sure that the land is remediated to the right levels.

**THE PRESIDENT:** Ms Velshi?

**MEMBER VELSHI:** To staff, when you meet with members of the public, municipalities or any other stakeholders, do you get roped into areas that are clearly outside your scope and become the middle person to help resolve things?

**MS MURTHY:** Kavita Murthy, for the record.

I'll pass this back to John Thelen and Graham, who have done an extensive amount of outreach with the community; however, yes, it does inevitably happen. As

the Commission has come to appreciate over the last two days, it is a complicated relationship, and there are many parties involved and there are many emotions involved, so it is natural for people to look to the CNSC to be the one who solves all the issues related to this megaproject, whether it is within the legal agreement or not.

However, our authority extends to the mandate that is given to us under the *Nuclear Safety and Control Act*. For any other authorities that arise from obligations, whether it is at a municipal level, provincial level or any other level, we do expect CNL to respect those. We have ensured that CNL has a very robust public information program, and we do believe they have done a lot of work to inform their stakeholder community, but to date we have not had any issues.

We have interesting questions that come up, and I'll ask John Thelen to respond to that.

**MR. THELEN:** John Thelen, CNSC, for the record.

Over the past few years, CNSC staff have done extensive outreach to Port Hope, and to the citizens of Port Hope, most recently at the Port Hope fall fair in September, where we had a chance to meet and greet hundreds of fairgoers.

Very often, and why I feel that outreach

is very important, is clarifying the roles and requirements of the CNSC, and distinguishing CNSC as a regulatory authority, different than CNL or Cameco, who are licensees. Often the questions I'm asked is scheduling issues, you know: when will my house be remediated or my backyard be remediated? Those are examples where I direct them to CNL, but say when that remediation is done it will follow CNSC licensing requirements, and will be done in a safe manner.

**THE PRESIDENT:** So a couple of quickies here.

On 7, the mayor, I think, will look for confirmation. "The municipality -- this is the last sentence of number 7:

"The Municipality is requesting confirmation...the traffic and safety aspects... will be reinforced through the Licence."

**MS MURTHY:** Kavita Murthy, for the record. This relates to the environmental assessment, and I'll ask Dr. Caroline Ducros to respond to the question.

**DR. DUCROS:** Caroline Ducros, for the record.

Yes, the fullness of the follow-up program is a condition in our licence. The socio-economic aspects

are overseen by the AECL and the biophysical aspects are overseen by ourselves. Annually we get a follow-up report. The last one we received was in June 2016, and it was sent to both AECL and ourselves. AECL reviewed the socio-economic aspects of that, which includes traffic and safety, and then they report to us on those aspects so that we can report to the Commission on both the biophysical and the socio-economic aspects. In AECL's review of the report that was received in June, they have found that CNL is meeting all the traffic and safety requirements that were set up in the follow-up program.

**THE PRESIDENT:** Thank you.

So my last question here is: remind me again, who issued the certificate that says the house is clean?

**MS MURTHY:** Kavita Murthy, for the record.

I believe you're talking about a letter that is issued by CNL.

**MR. HEBERT:** Craig Hebert, for the record.

That is correct. It's referred to as a compliance letter. Once our property radiological survey determines that there is no low-level historical radioactive waste on-site, we issue a compliance letter. Should there be low-level radioactive waste present on the property, the property would be then remediated, as part of

our remediation program, following which a compliance letter would be issued indicating that it now meets the PHAI cleanup criteria and no further work is required.

**THE PRESIDENT:** So that remediation certificate, you can take that to the bank, nobody is going to second-guess it or check on it or want a second opinion?

**MR. HEBERT:** Craig Hebert, for the record.

That is the purpose of that letter: is to certify that the property does meet the PHAI cleanup criteria.

**THE PRESIDENT:** Okay.

Any other comment on this?

Thank you.

**MR. LEBLANC:** Thank you

The next submission is a written submission from the Northumberland County, in CMD 16-M44.6.

Any questions?

**CMD 16-M44.6**

**Written submission from the  
Northumberland County**

**THE PRESIDENT:** So just to reinforce the Highland Drive, because there's a lot of discussion about that, that's a negotiation between AECL and the

municipality, is that correct?

**MR. HEBERT:** Craig Hebert, for the record.  
That is correct, with CNL's support.

**THE PRESIDENT:** Thank you.

**MR. LEBLANC:** The next submission, which is the last one, was to have been an oral presentation from Mr. John Morand. We finally were able to reach him a few moments ago and he's asked us to convert his oral presentation into a written submission. So I refer the members to a written submission, in the CMD 16-M44.7.

Any questions from the members?

**CMD 16-M44.7**

**Written submission by John Morand**

**MEMBER MCEWAN:** So I guess I have a process question.

A lot of this seems to be related to the compensation program, and I'm guessing that is not within our remit that this is part of the PHAI?

**MR. HEBERT:** Craig Hebert, for the record.  
That is correct. The property value protection program, which is the subject of this intervention, is a requirement under the legal agreement between Canada and the municipalities, and CNL

administers that program on behalf of AECL.

**THE PRESIDENT:** Is there anything new about this program, the take-up? Maybe somebody can tell us whether it's working or not working. Why is this intervenor complaining? I mean we have heard from this intervenor many, many years now. But is there anything new that maybe you, or maybe AECL -- I don't want to put you on the spot here, but I noticed somebody from AECL -- that can actually clue us in as to is there anything new, is it working, is there anything that's required, more money is required -- I have no idea what -- and it's dealing with the so-called stigma that was associated with this organization. Again, not CNSC mandate, but CNSC intervention. I think we should be on the record.

**MR. HEBERT:** Craig Hebert for the record.

I'll ask Marty Kapitan, the manager of Legal Agreement Programs, to comment further. But as I mentioned in my presentation earlier, the Property Value Protection Program was recently renewed as a result of an NRCan review that has taken place over the last few years. And to be clear the Property Value Protection Program compensates homeowners or property owners for any measurable loss on the sale of their property, rental income, or mortgage difficulties directly as a result of

the project, not the presence of the waste. And Mr. Kapitan can talk about how that renewed program is going.

**MR. KAPITAN:** Marty Kapitan for the record.

Just to add to Craig's comments, as part of the review of the program, because it's a federal grants program and they're periodically reviewed, there was an extensive public consultation that took place by an independent company to allow for property owners, stakeholders, real estate agents, the various stakeholders to provide their input with respect to the program.

In addition to that, a technical review and administrative review was performed on the program. And one of the key components of the technical review was to do a robust analysis of the real estate market from 1998, prior to the signing of the legal agreement, right up to the present. And the conclusions from our expert -- or from Canada's expert with respect to that review indicated that to date the activities of the Port Hope Area Initiative have had no effect on the real estate market within Port Hope and Port Granby.

With respect to the renewed program, some of the recommendations that were provided not only through NRCan's review report but also heard from the consultation process focused on increased clarity, user-friendliness,

timeliness, consistency, and transparency. And as a result of those recommendations, we've implemented process improvements to the renewed PVP Program, resulting in all of the Property Value Protection Program documents being placed on our website, aligning with our Public Information Program, so in addition to having the Project Information Exchange to provide first hand for individuals to ask questions to staff from the PVP Program and also to guide them through the process should they have the need for it.

To date, since the renewal of the PVP Program on June 1st of 2016, we've received six property value protection claims, four loss on sale, two of which have been processed and completed. The remaining four are currently in processing at the appraisal stage.

**THE PRESIDENT:** Ms Velshi?

**MEMBER VELSHI:** Just a couple of clarification on some other aspects of this submission.

On point number 9, there's some mention made on an audit that sort of questioned the relationship between CNL and Port Hope. Maybe you can shed some light on, you know, were there specific findings from a formal audit? Then I'll get to my next one after.

**MR. HEBERT:** Craig Hebert for the record.

In terms of the intervention item 9, I'm

not sure what the reference to the audit is. It may be in terms of the references to mediation, it may be some of the legal agreement disputes that we've already talked about, none of which have gone to arbitration by the way.

There have been under the PVP Program specifically, which this may be referring to, if a claimant wishes to appeal their property value protection decision, there is an arbitration mechanism available through that program, but that does not involve Port Hope, the municipality, at all.

**MEMBER VELSHI:** Thank you. And then at point number 12, around noise levels and the averaging time. Can you comment on that?

**MR. HEBERT:** Craig Hebert for the record.

Mr. Kapitan can describe the background behind that.

**MS FAUGHT:** Sandra Faught for the record. I will answer this one.

So first off, in the intervention, Mr. Morand does talk about 200 trucks a day. That number is not realistic. Right now on average we're looking at probably about 60 trucks a day going to the long-term waste management facility. And likely the maximum in any day would be about 150.

Secondly, with regards to noise, the noise calculations that we'll be doing during construction are going to be based on three-day averages over 12-hour periods. And those 12-hour periods are the construction hours 7 a.m. to 7 p.m.

**MEMBER VELSHI:** Thank you.

**THE PRESIDENT:** Anything else? Okay. I think we are done.

--- Off record discussion / Discussion officieuse

**THE PRESIDENT:** Okay, go.

**MEMBER VELSHI:** Can you describe to us the kind of record keeping you're keeping when you do your property surveys and if 50 years from now, whenever, one wanted to go and see what the levels were and who lived where and so on, that that is available.

**MR. HEBERT:** Craig Hebert for the record.

I'll ask John Benson, the manager of the Port Hope Waste Characterization Program to comment further, but through former AECL and currently CNL, through our low-level radioactive waste management office and more recently with the onset of PHAI, an extensive amount of record keeping is data gathering, and therefore record keeping is conducted. And we have extensive records dating back decades. And every time a property is investigated

under the low-level program that I described earlier, or more recently the property radiological survey, that data is collected, compiled, and stored and will be for the long term.

And Mr. Benson may be able to provide some further detail if required.

**MR. BENSON:** John Benson for the record.

Again, just to add to what Mr. Hebert presented, there is a system in place out of CNL, a file system called Track. All the files from previous investigations that have been done by the low-level office are stored in that filing system. And they are filed by property-specific addresses. Any additional reports that we gather through the property radiological survey are also stored in that same Track system. So again, there is a record dating back from probably the early 70s that includes information on all the properties that we've done work on, and that will include any reports that we gather through our property radiological survey.

**MEMBER VELSHI:** Thank you.

And staff, is this part of our licensing requirement on what should be kept, for how long?

**MR. THELEN:** John Thelen, CNSC staff, for the record.

As an example, the records that were just

mentioned, during inspections we have looked at such records that are kept both in hard copy and electronic. And the maintenance of these records, or records as part of a waste inventory for the long-term waste management facility, are part of record keeping under the quality program at the Port Hope Area Initiative licences.

**MEMBER VELSHI:** Yeah, I was okay with the waste. It was really all these other properties. But that's --

**MR. THELEN:** Sorry, John Thelen for the record.

As far as the longevity of records maintained for the homeowners, I believe that's beyond the regulatory scope of the CNSC licence and would lie more with CNL and obligations to keep records for the Town.

**MEMBER VELSHI:** Thank you.

**MEMBER MCEWAN:** So slide 23 of the CNL presentation, the property radiological survey. Is the phasing of the five campaigns related to likelihood of risk? So you're doing the highest risk first and then moving to the lowest risk last? And are you expecting the number of properties from each project to decrease as you complete each campaign?

**MR. HEBERT:** Craig Hebert for the record.

That is correct. The first campaign, campaign 1, was actually a composite of properties around the municipality where we would likely expect to find waste as well as areas where we wouldn't or felt we would be less likely to find waste. It's a mix of urban residential, or sorry, commercial and residential and those sorts of things. And that helped us to design the subsequent programs. And campaigns 2 through 5 are staged in the manner that you've described, where the earlier campaigns are the group of properties that -- or the areas in which we have a higher likelihood of encountering historical low-level radioactive waste. So as our program continues, we expect to find less and less properties that require remediation.

**MEMBER MCEWAN:** So the total number of properties you're expecting and the length of time it takes you to get to that remediation, and I guess also the complexity of the remediation?

**MR. HEBERT:** Craig Hebert for the record.

Mr. Benson can again provide further detail. The number of properties that our program is anticipating is, as was in our earlier deck as well as I believe staff's, is about 8 to 10 percent of all the properties in Port Hope, so somewhere in the 400 to 450

neighbourhood. So far, our investigations and the numbers of properties that we've encountered so far and delineated, our planning assumptions are for the most part holding true.

Mr. Benson can provide more detail in terms of actual numbers.

**MR. BENSON:** John Benson for the record.

So yes, we at this point have found about 350 properties that have historic waste on them. And again, we're still well within the 10 percent range that were initially anticipating.

The survey is moving along quite nicely. We expect to finish it up in 2019, at least the fieldwork portion of it. And that will lead into the remediation design of these sites. We currently have a remediation designer hired to start that process. And that will lead to, again, the remediation of properties starting in 2018.

**MEMBER MCEWAN:** So you're planning to start remediation before the final phase 5 is completed?

**MR. BENSON:** John Benson for the record.

Yes, that is correct.

**MEMBER MCEWAN:** And just a question for staff. So CNL are providing the letter that confirms that the house is clean, presumably, after remediation as well. Do you validate the CNL data and validate the fact that the

clean-up has been completed successfully?

**MR. THELEN:** It's John Thelen, CNSC staff, for the record.

CNSC staff don't verify item by item each property within the town of Port Hope that goes through this process. Out of the 4,800 properties, a remedial process is in place that looks at all the properties. During our inspections, we verify, look at records to confirm that sites that have gone through this process, whether the records align with what is being stated, and whether the properties are essentially deemed free of LLRW or indicate that they require remediation, to ensure there are no false positives and false negatives.

**MEMBER MCEWAN:** But you don't do a random sampling of properties just to confirm the data?

**MS MURTHY:** Kavita Murthy for the record. We don't have a program of random sampling. It is something we'll take into consideration once the remediation work is well underway.

**MEMBER MCEWAN:** But, again, random sampling of those that have been told they need no remediation?

**MR. THELEN:** No. As a part of CNSC's independent analysis, no, CNSC hasn't done independent sampling of properties that are going through the

radiological survey. The intent of the radiological survey is a robust program, four-step program. And CNSC staff's limitations have been to verifying, going to homes that have gone through this process to verify that the data is being collected, is accurate and have looked through both the records of the organizations and the contractors that are doing the work and the output of these radiological surveys.

**THE PRESIDENT:** But you could, during remediation, have a sample, you know. You know the address, you know where they are. You can observe some remediation and just make sure that it is -- gets clean to the criteria -- the cleaning criteria.

**MS MURTHY:** Kavita Murthy for the record.

I'll ask Kiza Sauvé to respond, but under the umbrella of the independent environmental monitoring program, it is possible for them to come up with a program of that nature. We don't have anything in place at this point in time.

**THE PRESIDENT:** But I also thought that you can watch and monitor what CNL is doing, just as an inspection. An inspector can look at a set just to make sure that they clean up to the criteria that, you know, that the MOE, let's say, the 23 microgram -- microgram? I cannot remember -- that it's being adhered to.

**MR. THELEN:** John Thelen for the record.

So if I could state that has not been done for every property, but CNSC staff does do that on an ongoing basis as part of our inspections, not only to see soil boring sample collection but indoor gamma survey, exterior gamma survey. I've witnessed that within the town of Port Hope. And we plan on doing that on an ongoing basis throughout the process with an emphasis on properties where low-level radioactive waste has been identified to ensure that the process of ensuring that all homes have been cleared of LLRW following that process occurs.

**THE PRESIDENT:** So related to that, there is on your slide 20 -- and by the way, I really appreciate -- I like photos in presentations that explain what I'm looking at so I can understand in doing -- so thank you for those. Really nice deck here.

In one, in slide 20, you talk about trial remediation. So did you actually do a trial remediation? How did it work? Any surprises? How far did you have to dig, et cetera, et cetera.

**MR. CASE:** Glenn Case for the record.

Yes, we did a trial remediation on a property down on King Street. It was actually observed by CNSC staff while we were doing the work.

We did learn a number of lessons from

that. One of the important things I think was the importance of characterization, the number of bore holes to be drilled to adequately define the extent of the contamination, and also documenting the precondition before you start to do the work, where all the trees are located and the bushes and the ponds, so that when it comes time to restore the property, you put it back the way you found it. So we learned a lot from that trial remediation. Also costing was an important thing to help us as well.

**THE PRESIDENT:** Thank you. Ms Velshi.

**MEMBER VELSHI:** So before we leave this, does your process allow, if you're checking a property and it is contaminated higher than you had expected or if the owner is particularly nervous, that you actually expedite remediation and do it right away?

**MR. HEBERT:** Craig Hebert for the record.

Mr. Benson can provide further detail, but in terms of -- there is a program under the low-level radioactive waste program for artifact recovery if we were to find a particular item that was of historical low-level radioactive waste significance, that can be removed and safely stored.

In terms of remediating the property itself in advance, we don't have that ability in a significant sense because the mound isn't open yet. Under

the low-level program, should renovations or home improvements or driveways, swimming pools, or what have you require to be constructed on a specific property, our construction monitoring program will come along and clear the footprint of that improvement, if I can put it that way. And if remediation is required, the temporary storage sites that were referred to earlier can be the temporary repository for some of that material.

**MR. BENSON:** John Benson for the record.

Just to add a couple points to that. We have got a prompt action level, so that if our consultant when they're doing a survey finds something that's elevated at a level that we think could be a health concern, they are instructed to notify us again in a very prompt timeline. We then interact with the low-level radioactive waste office to go in and address the situation. In some cases, we may capsule the waste if it happens to be loose. If it's something that can be removed, we will remove it or we may determine that, you know, it's not a health issue at the current time and it just remains in place.

**MEMBER VELSHI:** Thank you. And I may have missed this in your presentation. Your existing two waste management facilities, what would be their end state once, you know, you've taken the waste away from them and --

yeah, would there be any land use restrictions on them and  
. . . .

**MR. HEBERT:** Craig Hebert for the record.

In both Port Hope and Port Granby's case, the long-term waste management facilities, once closed and capped, will be vegetated on the surface. And the physical configuration is designed to blend in with the surrounding topography. They'll look like hills, if I can put it that way.

As part of the multilayer cap system, there are intrusion barriers and things like that to prevent burrowing animals from getting through the cap material. But certainly in the case of Port Hope, there will be -- the thickness of the cap is designed so that there will be background radiation levels at the surface. And consistent with the community's plans, it won't be fenced. It'll be available for passive recreation uses after it's closed and capped.

**MEMBER VELSHI:** And that's for both of them?

**MR. HEBERT:** That is correct.

**MEMBER VELSHI:** Thank you.

**THE PRESIDENT:** Dr. McEwan.

**MEMBER MCEWAN:** So in the staff CMD, pages 24 and 25, particularly the fence breaches, those sound

particularly concerning, particularly as in Port Granby there is now -- the transfer has started. So do you have any requirements for the licensee to enhance security on those sites or to put enhanced monitoring in?

**MS MURTHY:** Kavita Murthy for the record.

These events did not take place recently. So as a result of the discovery of the fence breaches, the licensee did do enhanced patrolling. I'll let CNL respond further to that question.

**MR. HEBERT:** Craig Hebert for the record.

Ms. Faught can provide greater detail.

**MS FAUGHT:** Sandra Faught for the record.

As CNSC staff have mentioned, we did increase fenceline inspections for a period of three months after these incidents happened. We were concerned that this was a trend. During that time, no further incidents were found.

As you witnessed on Tuesday morning, the activity at Port Granby has been significantly progressed. So the contractor at the Port Granby site has a number of security measures that are in place that do significantly enhance what's happening there. We have the security kiosk that's right at the gate. We have cameras all over the

site that we can monitor the fencelines. The contractor is providing daily inspections of the fenceline. It is a large site, so I'm not saying that they do daily inspections of the whole fenceline every day, but over the period of a month the whole fenceline would be inspected. Of course CNL staff does oversee this, and during compliance verification we ensure that the contractor is meeting these standards.

**MEMBER MCEWAN:** Thank you. And the other two reportable events, the leak and the pipe break, how long did it take for those to be discovered? And I think in the pipe break you say it was repaired immediately. But were they discovered quickly and sort of effectively?

**MR. HEBERT:** Craig Hebert for the record.

I'll ask Mr. Ravishankar to talk about the items other than the pipe break, and Mr. Galanter to comment on the pipe break.

**MR. RAVISHANKAR:** So if I understand the question correctly, you're interested in knowing how quickly the repair was done?

**MEMBER MCEWAN:** (Off microphone)

**MR. RAVISHANKAR:** Okay. Mr. Mark Galanter can confirm this. I believe the discovery happened within hours. As soon as it was noticed, you know, our staff have

a questioning attitude. When they noticed that there was a little bit of water puddled in the area when it was discovered, immediately they questioned, you know, what may be happening here. And the action was taken in terms of taking a sample, starting the repair, and additional steps that were taken to make sure that the waste water treatment plant discharge was not happening that would contribute.

So what led to the reportable incident here is because this break happened right at the contaminated site; some of the surface water that was in the area entered this broken pipe and went out through. So the contaminated water was still there in the old contaminated site, so it was not like there was an introduction of new contamination that came in.

**MR. GALANTER:** Mark Galanter, for the record.

I can confirm that the incident was identified within 24 hours and repaired within 24 hours.

**MS MURTHY:** Kavita Murthy, for the record.

Yes, and I can report that the licensee reported it to us right away. The information was shared on their public website, and also reported on our own public website.

**THE PRESIDENT:** Ms Velshi.

**MEMBER VELSHI:** My final question, and

I'll start with CNL and then ask Staff. So given you've reached some very significant milestones in the recent past, looking ahead what do you see as some of your biggest challenges or the biggest risks? Give me the top three in delivering on this project.

**MR. HEBERT:** Craig Hebert, for the record.

I'll ask Mr. Bryan Tyers, Director, Project Delivery, to comment from a construction perspective. We have a significant amount of contracting still before us. I think the significant challenges ahead are to maintain the rigour that we have in place with respect to strong project management and program management. We have a very rigorous and detailed project management and program management baseline in terms of monitoring our project metrics and deliverables and milestones and all those sorts of things. So we update that on a regular basis, report regularly to AECL as our client in that regard.

I think, you know, maintaining the solid rigour that we have and focus on safety, as I have described earlier, the most important factors going forward from a physical construction perspective I'll ask Mr. Tyers to comment further.

**MR. TYERS:** Bryan Tyers, for the record.

So with respect to the top three risks as

I would see it from now to the completion of the contract. Fundamentally, we're looking at the conventional safety risks that we have on site, but overall, as has been reiterated several times, our priority is the protection of our workers, the public, and the environment.

So with respect to our outstanding work, I believe we still have major construction works at our Port Hope Long-Term Waste Management Facility, so a fair amount of heavy equipment, a lot of manpower, and a lot of focus on that work.

I'll give you four actually, as well as work at the harbour front, as has already been explained, we already have fairly detailed design in place, but again there's a lot of interaction with both Cameco, the community, as well as environmental protection aspects to that work which we'll have to manage.

On the small-scale sites, actual remediation work. In that case, we will be directly interfacing with the public on that work, so just in controlling that work overall. But again, as has been reiterated through our investigation process, a lot of that work is intentionally methodical; we do a lot of diligence with our contractors, a lot of diligence in our planning, and a lot of stakeholder engagement with both the regulators as well as any oversight bodies so that we can,

you know, very diligently and methodically execute that work.

Everything has been, you know, very well laid out in our schedule so that we know we have the time, the resources and the expertise to safely execute that work. But in terms of major risk, could be the future remediation or the ongoing remediation of the Port Hope Long-Term Waste Management Facility, the small-scale sites, and the harbour.

MEMBER VELSHI: Thank you. Staff, from a regulator perspective, what do you see as your sort of biggest area as concerns or priorities?

**MS MURTHY:** Kavita Murthy, for the record.

I will start to answer this, and I'll ask John and Graham to supplement it with information.

CNL operates these two projects under the licence given to it by the Commission. To that end, our responsibility rests with making sure that all regulatory requirements are met. We are also aware of the role of different other regulatory bodies in this project, so one of our priorities is also making sure that all regulatory partners in this project are informed and CNL adheres to the requirements as they apply throughout the lifetime of this project.

Upcoming here, the major activities will

relate to the commissioning of the wastewater treatment plant, the setting of release limits based on our data provided to us, information provided to us by CNL, and setting action levels.

As you have seen over the last two days, there are a lot of activities related to Cameco that are going to also start taking place. So as both of these entities are CNSC licensees, so we will have the responsibility of making sure each of these entities has its operations in line with regulatory expectations.

Now, I'll pass the microphone to John Thelen.

**MR. THELEN:** John Thelen, CNSC, for the record.

Just to augment on that, one of the major activities or changes in shifts in what CNSC does for regulatory oversight has been the transformation of routine inspections on an annual basis when the sites have been in a care and maintenance mode to inspections that are tied to key milestones in the project.

When work is being done for the first time, to ensure that augmented environmental monitoring is being done and that the work is being done safely, protective of the public, the environment, and workers. As well as working and collaborating with other members of the

joint regulatory group.

Recent examples include working with Environment and Climate Change Canada and doing influent and effluent monitoring at the Port Granby project site to verify that what's being released from that site aligns with the design objectives and also that releases are not toxic to the environment. So we're going to continue with those types of activities, including working with other regulatory bodies such as MOECC and ECCC.

**MS MURTHY:** Kavita Murthy, for the record.

So I'd like to finish off by saying that there is an environmental assessment and an environmental monitoring plan, and an EA follow-up program, so a lot of what is going to be happening in the next little while will be subject to ensuring that these requirements are met with.

A lot of activities that are taking place, in particular at the long-term waste management facilities at this time, are once in a lifetime activities, there has to be inspection at a given point in time. We cannot reschedule -- do those inspections when that activity's happening, because once the mound is closed, it's closed.

So we do have those urgent needs to plan our inspections based on the scheduling of these activities by CNL. To that extent, we are a little bit dependant on

how quickly these activities go through. We are not concerned with the pace of the project, we are concerned with being able to inspect these facilities -- these activities as they're taking place.

We have our resources; geotechnical experts, experts in water... So we have done those inspections and we intend to continue doing them as this project moves forward.

**MEMBER VELSHI:** Just to confirm, when there's certain key milestones like that where you need to come and do your inspections, you know of those fairly well ahead in advance or do these change and slip at the 11<sup>th</sup> hour?

**MS MURTHY:** Kavita Murthy, for the record.

We do know about them in advance in terms of rough timing so we can plan for it. Certain times there are slippages, which we can accommodate, we do work with them, we do understand on a project of this scale it's inevitable that there are some times when they will not meet the exact date they have told us. So far, they have been pretty good about letting us know ahead of time and, to my recollection, we have not missed any inspection that we were supposed to do.

**MEMBER VELSHI:** Is your ability to conduct this inspect a prerequisite for them to move to the next

level?

**MS MURTHY:** Kavita Murthy, for the record.

Yes, in some instances. Wastewater treatment plant commissioning was one of them where they had finished their commissioning and they wanted to go into routine operations, and we did require our staff to go and do an inspection before they could start doing that.

**THE PRESIDENT:** Dr. McEwan.

**MEMBER MCEWAN:** So just a couple of questions. Did the archaeological survey show anything, find anything?

**MR. HEBERT:** Craig Hebert, for the record.

Sandra Faught will be able to discuss those details.

**MS FAUGHT:** Sandra Faught, for the record.

The archaeological survey that was conducted before the Port Granby construction activities identified a pioneer-type homestead that would have been in that area. There were no historic artefacts from the Indigenous peoples that were of a significance in that area.

**MEMBER MCEWAN:** One of the things we've heard quite a lot over the last couple of days was concern about the road remediation part of this project, both in terms of dust and in terms of the current activity levels

in the roads waiting for remediation. Can you sort of describe those levels and what your plans for remediating the dust or whatever other risks might come from the construction?

**MR. HEBERT:** Craig Hebert, for the record.

There's sort of two components to road issues. One, is the physical -- or three really -- there's the physical condition of the roadways in terms of their ability to support the truck traffic, and that's one of the items we're working very closely with the municipality on with respect to road improvements before the truck traffic, and then any degradation as a result of our activities, the repair of those.

The second is traffic safety, there are some safety improvements as we are changing the -- will be for the duration, and the time span over which the project will be conducted, we're changing some of the traffic patterns and volumes and things like that as a result of our activities. So if there's some safety improvements that, you know, we're working with the municipality on that we'll implement.

Then in terms of dust management with respect to the hauling around the municipality on the designated haul routes, all of the trucks will be fully tarped, they'll be monitored before they leave their site,

they'll be monitored again when they arrive at the waste management facility, and cleaned and monitored again before they leave to make the return trip empty.

So throughout that whole process extensive travel documentation, GPS tracking and all those sorts of things will be in place to ensure that the trucks stay on those routes, there's no material tracking onto public roadways and all those sorts of things.

**MEMBER MCEWAN:** Thank you. Staff, any comments?

**THE PRESIDENT:** Ms Velshi?

So I'd like to come back to the home remediations. You know, when I look at the map on your slide 9 and all the unplanned material that was distributed all over the city, and you'll remember some of us have a history about how it was distributed to school and for people, like come and get it, it's a freebie.

I was a bit surprised that it was only 8 to 10 per cent that you find that require remediation. So run by me again, how do you drive by to find those -- when you do the surveys, how do you determine which home here requires cleanup, which does not? You did it by different chunks, how did you decide where to go, where not to go?

**MR. HEBERT:** Craig Hebert, for the record.

We are doing our property radiological

survey on all 4,800 properties individually throughout Ward 1 of the Municipality of Fort Hope and a few properties in Ward 2.

John Benson can provide the details, but there's specific on-site testing in the four stages that I described earlier on each individual property. Mr Benson can provide, again, a recap of what those are.

**MR. BENSON:** John Benson, for the record.

So just before we even started the survey we looked at all the individual historical files that are in place for the properties in Port Hope, and there's probably 4,000 or so property files already in place. So we looked at all of those first, we did a review of those and we kind of summarized for each of those sites what the expectation of waste was based on previous findings and previous survey work that was done. So we used that as kind of our starting point.

As Mr. Hebert mentioned, we are now going out to all 4,800 properties to survey them. We start out with an initial radon survey. Radon can be an indicator of historic waste, so if we find elevated radon in a property, a house, that leads us to do additional intrusive investigation, which means borehole drilling around the perimeter of the house. Again, looking for historic waste.

We do an extensive gamma survey, typically

a 1 x 1 metre grid on the outside of each house or on the property grounds. We do a similar type interior gamma survey inside the house. Based on the results of the gamma surveys and on the information from the historic files, we determine where we need to drill boreholes.

Every property in Port Hope will receive at least one borehole and at least one soil sample. Any site that has, again a previous history of historic waste or where elevated gamma readings indicate the potential for historic waste, we drill additional boreholes. Typically, the number of boreholes per property will range from 1 to 10.

Again, if we find any signs of historic waste, that moves us into delineation mode where we would try to better define where the extent of the waste is. Again, that can, you know, be another five boreholes, 10 boreholes, whatever needs to be done to determine where the waste is and what the boundary is.

**THE PRESIDENT:** So I just want to make sure I understand. For you to do the boreholes you have to have positive radon or it can be an elevated gamma reading? I mean, does somebody actually walk to the property and actually does that, all 4,800?

**MR. BENSON:** John Benson, for the record. Yes, every single property will have a

crew go onto it to do the exterior gamma, interior gamma, and the drilling, and the radon as well. We drill a borehole regardless on every property. You don't have to have elevated radon or elevated gamma for us to drill a borehole. But if we find elevated radon or elevated gamma, that would lead us to drill a larger number of boreholes to determine if there is historic waste in that area.

**THE PRESIDENT:** So all 4,800, that represents what percentage of the total households or population?

**MR. BENSON:** Every house and property will receive a survey.

**THE PRESIDENT:** Sorry?

**MR. CASE:** One hundred per cent. Glenn Case, for the record. One hundred per cent of the properties in Port Hope will be addressed through this program.

**THE PRESIDENT:** Okay. So, you know, I'm a Port Hope long-time resident and I don't trust government, there are such things, so I want to see the result in the file myself. Is the data for all the stuff you have done on my property available?

**MR. HEBERT:** Craig Hebert, for the record. Yes, individual property owners' data is made available to the individual property owner.

**THE PRESIDENT:** So people can walk to your office and get the record of all of this?

**MR. HEBERT:** That is correct.

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

**MR. HEBERT:** If I could make one final comment? I'd just like to acknowledge to the Commission that Glenn Case, who you heard from today, is retiring in April of next year. After nearly 40 years of experience in low-level radioactive waste across Canada, particularly in Port Hope and Canada's north.

I would like to acknowledge to the Commission that the programs here in the low-level office as well as PHAI have been greatly influenced by the work and expertise of Glenn over the years. So the Commission can rest assured that our work will be conducted and completed safely and appropriately as a direct result of Glenn Case's passion and dedication.

Thank you.

**THE PRESIDENT:** I can't believe you're letting him go.

--- Laughter / Rires

**MR. HEBERT:** He's not gone yet, and we have a lot for him to do between now and April. Thank you.

**THE PRESIDENT:** You do have the final word. Congratulations on your retirement, Glenn. We

enjoyed your historical overview in our tour.

**MR. CASE:** Glenn Case, for the last record. It's been an honour and a privilege to present this project to you, and I strongly encourage you to track our progress. We look forward to the opportunity to give you an update in a year or two.

**THE PRESIDENT:** Oh, on an annual basis.

--- Laughter / Rires

**THE PRESIDENT:** Any final comments? Okay, thank you.

Marc?

--- Off microphone / Hors microphone

**THE PRESIDENT:** You're not part of this committee hearing; there's a rule in here. If you want to say something very quickly, go ahead.

--- Off microphone / Hors microphone

**MR. LEBLANC:** Ms More, I'll just ask you to go to a microphone, please.

**MS MORE:** Faye More, for the record, resident of Port Hope, property owner.

One of the concerns that I and others have had is around the disclosure issue of data, how we find out about our own properties and neighbours' before remediation is done.

But in answer to the question around is

all data contained in the private homeowner file? It is my experience that that is not the case. That the information contained in the municipal roadway and frontage surveys that directly affects property owners is not contained in the file. I am a personal example of that.

It is critical. The reason it's relevant is where there is contamination, where there is remediation that is planned and is on a list of the PHAI initiative for cleanup it is not disclosed in the homeowner file that I accessed under Access to Information. So I got it because I requested and got the municipal roadway and frontage survey.

So there are two solitudes here, and we all know that the radiation, the gamma radiation on a road that your children walk on and bike on, and the radiation on your front lawn that is going to be remediated is critically important to know about and should be contained in the homeowner file.

I can appreciate it's a challenge, because so many of the roads are contaminated and do need cleanup.

I live in an area where it would not even be expected. So it is not correct to tell you and to reassure the public that all data is contained in the homeowner file. I would like an understanding of why it is not.

**THE PRESIDENT:** You want a quick reply to this?

**MR. HEBERT:** Craig Hebert, for the record. Mr. Benson can elaborate but, as I indicated earlier, the data that we've collected on an individual property is contained in an individual property file. That information is available to a homeowner should they request it. We'd be happy at anytime to have any homeowner come to our project information exchange and we will provide that information.

In terms of contamination details out in roadways, we are still conducting those investigations now. As I mentioned in my earlier presentation, there's about 22 kilometres of roadway in the municipality where there is a potential to encounter contamination. As part of Mr. Benson's program, that investigation is ongoing currently.

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

**MS MORE:** May I comment back?

**THE PRESIDENT:** No, listen, we are not going to go through another round here.

**MS MORE:** My -- this is --

**THE PRESIDENT:** If you don't like some of the answers, write to us and we'll deal with this in a formal process. Thank you.

**MS MORE:** All right. Thank you.

**THE PRESIDENT:** Are we going to break now?

**MR. LEBLANC:** Yes, we will be resuming at 1:30 with the next part. So I'll take this opportunity to thank the participants this morning, including representatives from the Ministry of the Environment and Climate Change of Ontario, as well as the federal ECCC.

Thank you very much for your presence.

--- Upon recessing at 12:47 p.m. /  
Suspension à 12 h 47

--- Upon resuming at 1:34 p.m. /  
Reprise à 13 h 34

**THE PRESIDENT:** The next item on the agenda is an information item to provide us with the 2015 Regulatory Oversight Report for Nuclear Processing, Small Research Reactors and Class IB Accelerator Facilities as outlined in CMD 16-43 and 16-43.A.

The public was invited to comment in writing. The Commission received one submission.

Representative from the licensees are in attendance, so welcome to all of you here. And they will be provided with an opportunity to make short presentation and will be available for answering questions.

Also available to answer question via

teleconference, we have a representative from other licensees.

So the presentation will be in four parts based on the four section of the report. Part 1 includes the uranium processing facilities, and the intervention from Northwatch. Part 2, 3 and 4 will follow after the rounds of questions on Part 1 and a health break.

So I think we'll start hearing from CNSC, and Ms Tadros, you're going to start. You're doing the honour. Over to you.

**CMD 16-M43 / 16-M43.A**

**Oral presentation by CNSC staff**

**MS TADROS:** Thank you, sir, and good afternoon.

Good afternoon, Mr. President, Members of the Commission. My name is Haidy Tadros. I'm the Director General, Directorate of Nuclear Cycle and Facilities Regulation, and sharing with me today in the delivery of this presentation are my colleagues who I'll go through for all of four parts that you'll hear today.

So you know Ms Kavita Murthy, Director of the Nuclear Processing Facilities Division. In the back row, Mr. Jean LeClair, Director of the Nuclear Laboratories

and Research Reactors Division. With him also is Mr. Mark Broeders, Director of the Accelerators and Class II Facilities Division.

We have to our left here, who will be delivering the first part of the presentation, Mr. Lester Posada, Project Officer and the project leader for this regulatory oversight report.

And in the second row behind me we have Mr. Benjamin Prieur and Mr. Robert Buhr. Both are Project Officers and inspectors working in the Nuclear Processing Facilities Division.

So with that, we have colleagues who will be supporting, subject matter experts, technical experts who will be supporting and answering any questions the Commission may have. And as rightly noted, we are here to present Commission Member Document 16-M43 titled "Regulatory Oversight Report for Nuclear Processing, Small Research Reactor and Class 1B Accelerator Facilities 2015".

On this next slide, before we get into our presentation, I'd like to draw your attention to a few errors that were noted after the CMD was put together, and I'd like to walk you through those corrections. They will be pertinent should your questions come there.

So on page 23, second paragraph of staff's CMD, there is missing text in the paragraph that is

highlighted in bold in the first bullet of our slide.

On page 187, Table D-4, there's a missing zero on the financial guarantee amount for TRIUMF. The correct value is \$10,800,000.

On page 202, Table F-18, columns representing 2011 and 2015, air and emission results for TRIUMF, these values have been updated with the values that you currently see on this slide.

Please note that these changes do not impact CNSC staff's overall conclusion on the performance of the facilities discussed in this report. These errors will be corrected in the final version, and we do apologize for any confusion.

So this next slide positions CNSC's regulatory oversight reports. This is the third of five RORs that CNSC staff present to the Commission in public proceedings. The reports for the nuclear power plants and use of nuclear substances were presented in August and September 2016, respectively. The final two reports will be presented in December of this year.

Regulatory oversight reports are reports on the safety performance of activities and facilities regulated by the CNSC.

I will now pass the presentation to my colleague, Ms Kavita Murthy.

**MS MURTHY:** Good afternoon, Mr. President and Members of the Commission. My name is Kavita Murthy, 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 of how the CNSC rates licensee performance and how we provide risk informed regulatory oversight. This is followed by safety performance highlights for each facility.

Where relevant, we have also included updates in specific information that was requested by the Commission during last year's presentation.

Finally, we provide CNSC staff's conclusions for the performance of uranium processing, nuclear substance processing, small research reactor and Class 1B accelerator facilities in 2015.

The Canadian Nuclear Safety Commission regulates Canada's nuclear processing, small research reactor and Class 1B accelerator 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.

A licensee's performance is measured by the ability to carry out its licensed activities safely,

minimize the risks posed by the licensed activity and by its ability to operate in compliance with all regulatory requirements.

CNSC staff use 14 safety and control areas, or SCAs, to evaluate each licensee's performance. The SCAs are listed on the right hand of the slide.

Safety and control areas are technical topics that CNSC staff use across all regulated facilities and activities to assess, evaluate, review, verify and report on regulatory requirements and performance. Each safety and control area has an associated rating which could be fully satisfactory, satisfactory, below expectations or unacceptable.

Licensing and compliance activities enable the CNSC to provide assurance to Canadians of the continuing safety performance of licensees. The framework for regulating licensed activities of the CNSC applies a risk informed approach considering the level of risk associated with each facility across 14 safety and control areas.

Compliance activities associated with a given safety and control area are commensurate with the risk associated with it. The level of risk is reflected in CNSC staff's facility specific compliance plan which includes a number -- the number and scope of inspections

and reviews of operational activities and licensees' reports.

Areas that are more significant to safety such as worker dose control and effluent and emission monitoring are subject to more frequent and in-depth verification. Compliance plans are continuously reviewed and revised to take into consideration changes in licensees' performance and lessons learned.

To complement these activities, CNSC staff also conduct independent environmental monitoring in and around licensed facilities.

Separate from, but complementary to, the CNSC's existing compliance verification program is the CNSC's independent environmental monitoring program. The CNSC conducts independent environmental monitoring to verify that the public and the 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 CNSC has conducted independent environmental monitoring in 2014 and 2015, and also those that are planned for 2016.

The facilities scheduled for independent environmental monitoring program sampling in 2016 have, in

fact, been surveyed already, but the sample and data analysis are ongoing.

After the data is collected and analyzed, all of the monitoring results are posted on the CNSC's web site. The results from independent environmental monitoring program demonstrate that the licensee's environmental programs are effective.

The report provided in Commission Member Document 16-M43 and this presentation are organized by industry sector covering uranium processing facilities first, followed by nuclear substance processing facilities, then small research reactor facilities and, finally, the Class 1B accelerator facilities.

Performance data for all 14 safety and control areas for each facility is summarized in the overview section of the corresponding industry sector. Here, you will find detailed performance reporting for three safety and control areas; radiation protection, environmental protection, and conventional health and safety.

These SCAs cover key performance indicators for nuclear processing, small research reactor and Class 1B accelerator facilities.

In the facility specific sector, we provide performance data, events and highlights for 2015,

trending data for the facility, and identify areas of increased regulatory focus where relevant.

As the President mentioned, information about this meeting was made public by the CNSC starting in March 2016 and to support public participation, participant funding of up to \$25,000 was offered to intervenors through the CNSC's participant funding program.

CNSC staff CMD was made available to the public on September 4th, written interventions were accepted until October 3rd. Participant funding was awarded to Northwatch, who has a written submission today.

Also submitted as interventions are the mid-term reports for the three uranium processing facilities listed on this slide.

This completes the introductory part of the presentation. I'll now pass the presentation to Lester Posada, who will continue with the uranium processing facilities overview.

**MR. POSADA:** Thank you, Ms Murthy.

Good afternoon, Mr. President and Members of the Commission. For the record, my name is Lester Posada, and I am a project officer working in the Nuclear Facilities Division and the project coordinator for this regulatory oversight report.

I will now present CNSC staff's assessment

on the performance of the uranium processing facilities.

The nuclear fuel cycle begins with uranium being extracted from the ground and ends with its disposal following its use and the generation of energy. The term "cradle to grave" is commonly used to describe the nuclear fuel cycle.

The front end of the nuclear fuel cycle starts with uranium mining, followed by milling, refining, conversion and, in the case of Canada, fuel manufacturing. The uranium processing facilities discussed in this report are all located within the province of Ontario as shown in this slide and conduct refining, conversion and fuel manufacturing activities.

Cameco's Port Hope conversion facility is included in this report, was the subject of a licence renewal hearing earlier this week. Therefore, we will not be discussing its performance in detail within this presentation.

This table shows the licensing and compliance effort from CNSC staff in 2015 for uranium processing facilities. In 2015, CNSC staff spent 211 person-days on licensing activities at the uranium processing facilities. There were no licence amendments for any of the facilities. However, considerable effort was spent on modernizing the Licence Condition Handbooks

for these facilities.

1,269 person-days were dedicated to compliance activities in 2015. This was accomplished through inspections, desktop reviews of activities and processes, and through the review of licensee reports.

CNSC staff performed 15 compliance inspections at the uranium processing facilities. Findings resulting from these inspections were provided to the licensee immediately in preliminary reports followed by detailed inspection reports.

All enforcement actions arising from the findings are recorded in the CNSC regulatory information bank to ensure that all enforcement actions are tracked to completion.

The 2015 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 2015, all of the uranium processing facilities received a satisfactory rating in all safety and control areas.

The trend remains largely unchanged from previous years, with a few exceptions.

In 2015, the Blind River refinery continued to receive a rating of fully satisfactory for the conventional health and safety safety and control area in

recognition of nine continuous years without a worker lost time injury.

GE Hitachi's rating for environmental protection was changed from fully satisfactory to satisfactory as a result of an overall assessment of its program during 2015.

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

The graph on this slide shows the average and maximum individual effective doses in 2015 for all uranium processing facilities. The red line on this chart displays the 15 millisievert regulatory effective dose limit that a nuclear energy worker can receive in a year.

No worker received a dose in excess of the annual effective regulatory dose limit.

The maximum effective dose by any worker in any uranium processing facility was 12.6 millisieverts, which represents 25.2 percent of the annual dose limit. In 2015, radiation doses received by nuclear energy workers in the uranium processing facilities was effectively controlled.

This slide defines the estimated dose to the public from each uranium processing facility from 2011 to 2015. Doses to the public are conservatively estimated

from all uranium processing facilities, primarily by gamma dose rate measurements, air emissions and effluent releases as applicable.

Estimated doses continue to be well below the regulatory limit of one millisievert per year.

To confirm the effectiveness of emission abatement systems and to monitor the impact of uranium emissions from the facility on the environment, facilities operate high volume air samplers. The green line on this chart displaced the Ontario Ministry of the Environment and Climate Change standard for uranium in ambient air that took effect on July 1, 2016.

The results from the high volume samplers from 2011 to 2015 are shown in this slide, and indicate that a maximum annual average concentration of uranium in 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.

A risk assessment of 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 air quality standard.

Soil monitoring programs are intended to

monitor the long-term effects of air emissions to show whether there is an accumulation of uranium in soil in the vicinity of the facility. The green line on this chart displays the Canadian Council of Ministers of the Environment's guideline of 23 micrograms per gram uranium for residential and parkland land use. The chart also shows the annual average uranium concentrations in soil.

The data for all facilities is well below the provincial guideline.

Soil sampling results in 2015 continue to indicate that current uranium emissions from the uranium processing facilities are not resulting in levels observed in soils that would pose a risk to people or to the environment.

I note that due to extremely low stack emissions at GE Hitachi Peterborough, soil monitoring is not warranted. Also note that the Cameco fuel manufacturing sample soil on a three-year frequency. The next Cameco fuel manufacturing soil samples will be collected in 2016 and reported in next year's regulatory oversight report.

A key indicator on a performance of a facility's conventional health and safety program is the number of lost time injuries that occur at the facility. A lost time injury is an injury or illness resulting in lost

days beyond the date of injury as a direct result of an occupational injury or illness incident.

As shown in this slide, the number of recordable lost time injuries in 2015 at 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 2015 and that their programs are effective in protecting the health and safety of persons working in their facilities.

This completes the overview of the uranium processing facilities. I would now like to pass the presentation to Mr. Benjamin Prieur, who will continue the presentation with the facility specific performance of the uranium processing facilities.

Thank you.

**MR. PRIEUR:** Thank you.

Good afternoon, Mr. President and Members of the Commission. My name is Benjamin Prieur, and I'm a senior project officer in the Nuclear Processing Facilities Division.

I've been an inspector with the Canadian Nuclear Safety Commission since 2008, and I'm the lead inspector and project officer for the Cameco Port Hope conversion facility.

In the next few slides, I will introduce and provide some specific highlights for each uranium processing facility for 2015, starting with Cameco's Blind River refinery.

Cameco's Blind River refinery is a Class 1B nuclear facility located in Blind River, Ontario. The Blind River refinery's operating licence is valid from March 1st, 2012 to February 28, 2022.

The facility is located 200 kilometres north of Sudbury, Ontario on the north shore of Lake Huron. Cameco's Blind River refinery receives uranium concentrates from mines and mills worldwide. The yellow cake is then refined to produce uranium trioxide, which is an intermediate step in the uranium conversion process.

In 2015, there were no major modifications to the Blind River refinery facility that required Commission approval.

Cameco made improvements to the site by constructing a berm around the facility for flood protection. The berm was designed to mitigate the impact of a flood caused by severe weather.

The flood scenario was identified following Cameco's Fukushima defence in depth review against external hazards, severe accident scenarios and emergency preparedness procedures.

CNSC staff conduct outreach activities on a regular basis, including recent meetings with the Mississauga First Nation. The Mississauga First Nation is the closest community to the Blind River refinery, and is located approximately one kilometre from the refinery.

On October 6, 2015, CNSC staff met with the Mississauga First Nation's lands and resource committee, staff and community elders. CNSC staff gave a presentation, including information on the refinery's operational performance for 2014, and the results of the CNSC staff's 2013 and 2014 independent environmental monitoring program.

This meeting was supported by the CNSC's participant funding program.

In 2015, there were no environmental licence limit or action level exceedances at the Blind River refinery. Cameco has implemented an effective occupational health and safety program which has resulted in the refinery's ability to keep their workers safe from occupational injuries.

The refinery achieved 10 years without a

lost time accident as of June 2016.

There were no radiation action level exceedance at the Blind River refinery in 2015.

CNSC staff are satisfied that Cameco continues to protect the health and safety of workers and the environment and that refinery continues to operate in accordance with the requirements of their licence.

This concludes the section on Cameco's Blind River Refinery.

I will now introduce and discuss Cameco's Port Hope conversion facility in the next slide.

Cameco's Port Hope conversion facility is located in the Municipality of Port Hope, Ontario, and processes uranium trioxide from the Blind River Refinery into either uranium dioxide for use in the manufacturing of CANDU reactor fuel or uranium hexafluoride. Uranium hexafluoride is exported by Cameco for further processing later used as fuel in light water reactors.

Cameco's Port Hope conversion facility has been discussed earlier this week during the licence renewal hearing. I will skip through slides 28 through 31 and move on to Slide 32 of this presentation, which focuses on Cameco fuel manufacturing.

CNSC staff's complete review of the Port Hope conversion facility is available in the 2015

Regulatory Oversight Report for Nuclear Processing, Small Research Reactor and Class 1B Accelerator Facilities.

Cameco fuel manufacturing is located in the Municipality of Port Hope, Ontario, and processes uranium dioxide powder into natural uranium pellets and manufactures CANDU nuclear fuel in the form of natural uranium fuel bundles.

In 2015, Cameco implemented several improvements to the fuel manufacturing facility and its equipment, including improvements to ventilation systems, furnace upgrades and the commissioning of new uranium dioxide powder receiving and powder preparation area, which is an automated process. The upgrades to the fuel manufacturing facility resulted in overall improvements to the safety of the facility.

In 2015, there were two confirmed instances where action levels were reached. Both exceedances were reported to the CNSC and investigated by Cameco. Corrective actions were also established.

Cameco determined that the cause of the first action level exceedance was related to inappropriate use of respirators as the worker in question was not clean-shaven. One of the corrective measures included improved communication regarding proper usage of respirators. In the second instance, Cameco determined the

action level exceedance was in fact a non-personal exposure resulting from a contaminated dosimeter.

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

In 2015, Cameco fuel manufacturing did not exceed any environmental action levels. There was one lost time injury in 2015, however, where a contractor was injured while working in a tight space that was not a normal working space. This resulted in a one-day loss of time. CNSC staff reviewed and accepted Cameco's corrective actions.

Staff are satisfied that Cameco fuel manufacturing continues to protect the health and safety of workers and the environment.

This concludes the section on Cameco fuel manufacturing.

I will now introduce and discuss GE Hitachi Nuclear Energy Canada Incorporated facilities in Toronto and Peterborough.

GE Hitachi Nuclear Energy Canada

Incorporated, or GEH-C, processes uranium dioxide powder from Cameco's Port Hope conversion facility into natural uranium pellets at its Toronto facility and assembles the CANDU nuclear fuel in the form of natural uranium fuel bundles at its Peterborough facility.

In 2015, there were changes to key management positions at GEH-C, including the retirement of its President and Chief Executive Officer and a new appointment to the same position. In addition, improvements to plant equipment and processes, including upgrades to the loading dock in the Peterborough facility and natural gas supply upgrades, including header and piping replacements, in the Toronto facility. GEH-C also completed the implementation of a new systematic approach to training process and associated procedures to align with the Canadian Nuclear Safety Commission's REGDOC-2.2.2, Personnel Training.

In 2015, CNSC staff conducted a focused inspection of GEH-C's environmental protection program. As a result, areas of improvement were identified, leading to the change in the safety and control area rating for environmental protection from fully satisfactory to satisfactory. None of the findings from the inspection posed an immediate or unreasonable risk to persons and the environment. GEH-C developed a comprehensive corrective

action plan and CNSC staff are monitoring its implementation.

In March 2015, CNSC staff directed GEH-C's management to address identified deficiencies related to its public information program.

In June of 2015, GEH-C provided a 29-point improvement plan to ensure adequate engagement and communications with the local community near its Toronto and Peterborough facilities. A new position of Senior Manager, Community Relations and Communications was created as part of this improvement plan and all improvement activities were completed by December 2015.

CNSC staff continues to maintain increased oversight on GEH-C's progress, including participation in its community liaison committee meetings and presence during community outreach events in 2016. For 2015, CNSC staff assess that GEH-C's implementation of its improvement plan for public information and disclosure is satisfactory.

In August 2016, GEH-C notified the CNSC of its sale to BWXT Nuclear Energy Canada Incorporated. CNSC staff is currently reviewing the application for the licence transfer. CNSC staff recommendations will be presented to the Commission for consideration in December 2016.

In 2015, there were no regulatory limit or

action level exceedances at GEH-C. There were no lost time injuries in 2015. CNSC staff are satisfied that GEH-C continues to protect the health and safety of workers, the public and the environment.

This completes CNSC staff's performance review of the uranium processing facilities in Canada.

I will now pause the presentation at this point and we are available for any questions that the Commission may have.

**CMD 16-M43.1**

**Oral presentation by**

**Cameco Fuel Manufacturing Inc.**

**THE PRESIDENT:** I understand that we have some presentations from some of the licensees.

So let me go in order here and I will ask -- I understand that Cameco Fuel Manufacturing Incorporated has a presentation, as outlined in CMD 16-M43.1.

I understand that Mr. Jensen will make the presentation. Over to you.

**MR. SMITH:** I will do the introductions.

Good afternoon, Dr. Binder and Commission Members.

For the record, I am Tom Smith, Director of Compliance and Licensing for Cameco's Fuel Services Division. I assumed the role of Director a little over a year ago but have been with Cameco and its predecessor organizations in various environmental roles for the past 38 years.

With me today are my colleagues from Cameco Fuel Manufacturing.

Doug Jensen has been the General Manager of Cameco Fuel manufacturing Incorporated, or CFM as we call it, since December 2015. Prior to that, he served as Operation Manager at both the licensed facility in Port Hope and the zirconium manufacturing facility in Cobourg, Ontario, since joining Cameco in 2009.

With me today is also Mike Longinov. Mike is CFM's Manager of Environment, Occupational Health and Safety. Mike has been with CFM and its predecessor companies for 19 years.

We are here today to present the interim report on the safety performance of the CFM Fuel Manufacturing Facility at the midpoint of its 10-year licence term, as requested by the Commission in their Record of Decision back in 2012.

I will now turn over the presentation to Doug Jensen.

**MR. JENSEN:** Thank you, Tom.

For the record, I am Doug Jenson and, as Tom mentioned, I am the General Manager of Cameco Fuel Manufacturing. Thank you for the opportunity to present this information to you today.

Our licensed facility is located on the east end of the Municipality of Port Hope on Highway 2, the main route linking the towns of Port Hope and Cobourg. In operation since 1957, the licensed site includes a secure enclosed area of approximately 6 acres that is situated on a 20-acre parcel of land owned by Cameco. Approximately 145 people are employed at the facility, all of whom are engaged in the production of nuclear fuel bundles for domestic power generation. We are currently operating under a 10-year licence granted by the CNSC that expires in 2022.

My presentation today will focus on our performance in the key safety and control areas of conventional health and safety, environmental protection and radiation protection for this licensing period. I will also briefly discuss our efforts on public engagement and other highlights.

Safety is a top priority for our employees and the total number of injuries experienced during this licensing period has decreased. This graph shows the

safety statistics for the last five years.

Lost time injury, or LTI, is represented by the green line and is a measure of the frequency of workplace-related incidents that lead to employees missing scheduled work.

CFM experienced one LTI during the current licensing period, which was related to a contractor who was installing equipment in a cramped space. During the course of this work, the individual stood up and contacted a brace on the machine with their shoulder and the injury resulted in a medication being prescribed that prohibited the person from driving to work on the following day, thus a designation as a lost time injury. Our investigation into this incident has led to further improvements to our Contractor Management Program.

Days away, restricted or transferred, or DART, which is measured by the orange line, is a safety performance metric that measures work-related injuries where an individual does not miss time from work but is unable to perform all of their job functions without assistance.

Total recordable injury rate, or TRIR, is represented by the blue line. As described earlier in the week, this is a tool used to measure the frequency of less severe injuries in the workplace.

We have experienced an upward trend in TRIR in recent years, primarily due to the occurrence of muscle strain type of injuries. We have initiated steps to eliminate these injuries, including more employee involvement in our safety program, increased focus on stretching and equipment modernization to eliminate repetitive movement tasks.

No regulatory limits related to environmental protection have been exceeded during the licensing period. Our improvement efforts have focused largely on reduction of air emissions and the removal of legacy waste material from the facility.

In late 2015, we installed HEPA filters to the building ventilation in our uranium powder processing areas, an improvement that carried a design decrease of 90 percent of uranium emissions from that area.

A large project has also been undertaken to remove legacy waste from the site during this licensing period. To date, we have removed 1,300 cubic metres of material, which is approximately 60 percent of the material onsite, and plan to be near zero legacy waste onsite by 2018. All existing waste streams have identified and approved pathways and therefore there is no accumulation going forward.

No regulatory limits related to radiation

protection have been exceeded during the licensing period. A number of dose reduction initiatives have been completed, including improved occupational air quality due to implementation of enclosed processes, lowered extremity dose due to less direct operator interaction with the product, and enhanced early detection response and correction of upset conditions through the installation of continuous real time alpha-in-air monitors in the powder preparation and pressing areas. Additionally, we have improved the accuracy of our internal dosimetry program by introducing lung counting, which is consistent with the other Cameco Ontario sites.

In 2015, there was an acute uranium uptake incident identified by the internal dosimetry program. The deployment of continuous alpha monitors and the removal of direct operator interaction were planned prior to the occurrence of this event but are particularly relevant. The task that the individual was performing has since been eliminated later in the year as a result of our modernization and improvement programs. The new automated process uses continuous alpha monitors to detect any upset condition immediately.

Subsequent investigation of the event also identified a potential cause within our respiratory protection program. Upon discovery of this cause,

improvements were made and no additional elevated doses have been experienced.

This chart illustrates that the total effective dose for our nuclear energy workers has remained well below the regulatory limit during this licensing period. The dose assignment method was changed in 2014 from urine analysis to lung counting. This technology change was expected to increase the average effective dose due to the assignment of a dose to office staff, a practice that was not done prior to the change. It's also important to note that production volume has steadily increased over the licensing period.

We continue to have a high level of community support for our operation, as evidenced by our most recent public opinion polling. Highlights of the survey include 8 out of 10 Port Hope residents think Cameco makes information about its operations in Port Hope readily available to residents. Eighty-nine percent of Port Hope residents support Cameco's continued operations in Port Hope and 85 percent of residents agree that Cameco does everything possible to protect people and the environment.

This high level of support is a reflection not only of the work we do to communicate with the public through community forums, newsletters and social media, but also a reflection of the site's performance that has earned

public trust.

We continue to facilitate and encourage our employees to pursue volunteer opportunities to strengthen our community fabric. We are very proud of the role Cameco and our employees are able to play to support worthwhile organizations and programs that make this community a great place to live, work and play.

Performance in the key safety control measures of conventional safety, environmental protection and radiation protection are all showing continued improvement and there have been no exceedances of any regulatory limits during the licensing period.

One notable achievement at CFM has been the full implementation of a comprehensive preventive maintenance program during this period. This system allows us to standardize our practices relative to keeping all of our equipment in good repair and to create a framework on which continuous improvement can occur.

We have continued our cooperation with the IAEA during the licence period and have satisfied all the safeguard requirements set by that organization.

CFM has also undergone substantial technological change during the licence period. There were several key deliverables for our modernization efforts as we replaced aging assets during this period. Improvements

to conventional health and safety by reducing ergonomic strains, reduction of radiation exposure by limiting direct human interaction with the product, and improvement of environmental performance through reduced waste and emissions were among goals of these projects.

The automated bundle manufacturing system, or BMS, was installed in stages beginning in 2013 and was fully operational in 2014.

We transitioned several repetitive and close product contact operations from manual perform to machine perform, eliminating ergonomic concerns and product exposures in these areas.

The sintering operations were upgraded to improve operator protection and air emissions.

The powder preparation and pressing area was completely replaced in late 2015, again removing many manual close product contact operations in favour of automated operations.

Included in this project was a complete reengineering of both equipment and room ventilation systems for reduced emissions as well as the implementation of real time alpha-in-air monitoring.

Finally, we are partway through implementing additional improvements in the pellet grinding and waste handling areas, with the same design philosophies

that were in place for the other projects. The goal again is to eliminate repetitive tasks and remove the need for operators to come in close contact with the product.

These projects will wrap up early in 2017.

In summary, over the current licence period we continued to operate the fuel fabrication facility in a safe, clean, reliable manner. We remain committed to operational excellence, always improving our health, safety and environmental performance, and our workforce remains engaged and is the key contributor to all of our successes.

Thank you for your time. I would be happy to entertain any questions that you have.

**CMD 16-M43.2**

**Oral presentation by**

**Cameco Blind River Refinery**

**THE PRESIDENT:** I also understand that Cameco Blind River Refinery also has a presentation, as outlined in CMD 16-M43.2.

I understand that Mr. Astles will make the presentation. Over to you.

**MR. SMITH:** Good afternoon, Dr. Binder.

**THE PRESIDENT:** I just read what it says

right here.

**MR. SMITH:** Okay, that's no problem.

Good afternoon, Dr. Binder and Commission Members.

For the record, my name is Tom Smith. I am the Director of Regulatory Compliance and Licensing for the Fuel Services Division.

I shared my background with you earlier today, so let me introduce my colleagues who are with me in the row immediately behind the front.

Chris Astles is the General Manager of the Blind River Refinery, a lifelong resident of Blind River. Chris's involvement with the facility began during construction of the refinery when he worked with the prime contractor. He then started working for Cameco's predecessor, Eldorado Nuclear, in 1983. He held numerous positions of increasing responsibility and was appointed the General Manager 14 years ago.

Joe DeGraw is the refinery's Superintendent of Quality, Compliance and Licensing. Joe is a lifelong employee of the facility, joining the Blind River Refinery team in 1982 and assuming his current position in 2000.

We are here today to present an interim report on the safety performance of the refinery at the

midpoint of our 10-year licensing term, as requested by the Commission in their Record of Decision back in 2012.

I will now hand over the presentation to Mr. Astles.

**MR. ASTLES:** Good afternoon.

For the record, I am Chris Astles, the General Manager of the Blind River Refinery.

The refinery began operations in 1983 and currently has a 10-year operating licence from the CNSC that expires in 2022. We employ approximately 120 people, the majority of whom live in the local communities. These communities include the Town of Blind River, Iron Bridge, Thessalon, Sprague, Algoma Mills and Elliot Lake, as well as the Mississauga First Nation.

The refinery produces uranium trioxide by refining uranium ore concentrates which are received from mines throughout the world. The refinery is located on 636 acres of land owned by Cameco. The licensed site comprises a secured, enclosed area of 28 acres.

The refinery is located on the north shore of Lake Huron, along the shore of the Mississagi River. The licensed facility is located approximately 1 kilometre away from the Mississagi First Nation and approximately 5 kilometres away from the Town of Blind River.

This presentation will focus on our

performance in the key safety and control areas of conventional health and safety, environmental protection and radiation protection since 2011. We will also briefly discuss our efforts on public engagement and other highlights.

We continue to be a leader in safety performance, as evidenced by a number of recent milestones. In June of 2016 we reached 10 years without a lost time incident. With our strong systems and performance, we are striving to exceed our current record, 11 1/2 years without an LTI, and are proud to report that we have recently exceeded more than 3 million hours since our last LTI.

As you heard yesterday, the Mary-Jean Mitchell Green Award is awarded to the Cameco site with the best overall safety performance each year. We received this recognition in 2013 and 2015, bringing our total to eight awards.

Our safety culture is built around the premise that all accidents are avoidable. Our safety culture is reinforced by strong employee participation in safety programs and visible management presence on the floor. We have the advantage of being a small site with an experienced and highly engaged workforce.

Our safety program is effective and well documented. We use tools such as job hazard analysis for

non-routine work to ensure job tasks are identified and associated risks are mitigated.

In 2013, we completed a safety culture assessment. At that time, the site had an excellent safety record and the workforce was very satisfied with current levels of performance. The assessment recognized that this presented a challenge for management to identify areas for improvement, which led to the recommendation relating to the potential for complacency. Towards this end, we developed actions that were primarily focused on prioritizing existing activities so as to keep employees engaged in safety improvement initiatives.

We believe that our commitment to and support of our safety program greatly contributes to this strong safety performance. To give you a sense of this, there are a few hundred qualifications for our employees and in total our employees collectively hold more than 10,000 qualifications, the majority of which are safety-related.

This graph shows the statistics for the last five years.

Lost time injury, or LTI, is a measure of the frequency of workplace-related incidents that lead to employees missing scheduled work.

Total recordable injury rate, or TRIR, is

a measure of the frequency that also captures much lower severity incidents and thereby provides another lens we use to assess our safety performance.

Days away, restricted, transferred, or DART, is another safety performance metric that measures the severity of recordable incidents.

Both the LTI and DART have been zero since the start of the current licence period. The TRIR value has been trending down and is now at zero as well. It has been more than 25 months since our last recordable injury.

We attribute our safety performance to a number of factors. The site safety culture and safety performance is built around employee participation and open communication. As mentioned previously, we can draw a direct link to the safety culture and performance from our commitment to our training programs.

We have had several noteworthy successes during the current licensing period.

We are in the process of finalizing an updated environmental risk assessment which we expect to submit to the CNSC before the end of 2016. This confirms our refinery operations are not having an impact on the public or on the environment. As part of our efforts in accordance with the public information program, results of this report have been shared with Mississagi First Nation

and the Town of Blind River.

We are always looking at ways in which we can reduce our impact on the environment. Through rigid oversight of the operation and a commitment to continual improvement, uranium emissions in 2015 were the lowest in the history of the refinery. We have had no exceedances of discharge limits or action levels with respect to environmental performance and the refinery continues to be ISO 14001 registered.

There have been no regulatory dose limit exceedances during the current licensing period.

Early in the licensing period, we installed three whole body monitors at the refinery exit. All employees, contractors and visitors now have to use one of these monitors prior to leaving the refinery. These provide an additional point of control for potential contamination.

To complement the existing in-plant air sampling program, we have also installed three continuous air monitors, one in the auger sampling area and two in the calcination area. These units provide real time monitoring for elevated concentrations of uranium in the air. We have purchased two additional units which will be installed by the end of 2016.

Since the start of the current licensing

period, the refinery's average and maximum effective employee dose has decreased, with the average dose in 2015 less than half of what it was in 2012. The maximum individual effective dose has also dropped more than 40 percent. The maximum effective dose in 2015 was less than 15 percent of the annual dose limit. The reason for these improvements include improved operational performance and procedural compliance, though reduced production levels in recent years has also been a contributing factor.

The refinery has made improvements to the uranium concentrate sampling process to reduce the potential for employee exposure to uranium dust when sampling peroxide type uranium concentrates.

In 2015, we also implemented the mandatory use of positive air purifying respirators for specific job functions associated with changing bags in dust collection bag houses.

We continued to have a high level of community support for our operation, as evidenced by our most recent public survey completed in 2013.

As part of our efforts under our public information program, we continued to meet regularly with the mayor and Council of the Town of Blind River and with the Chief and Council of Mississagi First Nation. During these meetings we provide updates on the status of our

operation as well as seeking input on any matters relating to our operation.

In the fall of 2015, the refinery constructed a berm outside the perimeter fence line to mitigate the potential impact of a worst-case flood scenario. The flood scenario consisted of a maximum precipitation event coupled with multiple dam failures on the Mississagi River. There are three operating hydroelectric dams on the river, the nearest being approximately 30 kilometres upstream of the refinery. Given the distance from the closest dam and the geography, the impact in this extremely unlikely scenario is not expected to be severe. The berm provides an additional mitigation to minimize the potential impact of this extremely unlikely scenario.

During the current licensing period, we began incinerating contaminated combustible material from CFM. The refinery continues to make great strides in minimizing and reducing the volume of radioactive waste materials stored onsite by utilizing now established methods such as incineration and grit blasting.

We also substantially reduced the inventory of contaminated, non-combustible material stored onsite by almost 15,000 drums through shipments to a permitted waste facility in the United States.

Cameco continues to meet its security requirements and safeguard obligations at the Blind River Refinery.

In summary, over the current licence we continue to operate the Blind River Refinery in a safe, clean and reliable manner. We remain committed to operational excellence, while at the same time maintaining our health, safety and environmental performance at a high level. Our workforce remains committed and is a key contributor to all our successes.

This concludes our presentation. We would be happy to answer any questions you may have.

**CMD 16-M43.3**

**Oral presentation by**

**GE Hitachi Nuclear Energy Canada Inc.**

**THE PRESIDENT:** Thank you.

I understand also that GE Hitachi Nuclear Energy Canada Incorporated has a presentation, as outlined in CMD 16-M43.3.

I understand Mr. Ward will make the presentation. Over to you.

**MR. WARD:** Thank you.

Mark Ward for the record, President and

CEO, which was previously mentioned by the staff, and I came on board to this role in April of 2015. So good afternoon, Mr. President and Members of the Commission.

I would like to introduce my two colleagues here.

Sara Forsey -- she was also mentioned earlier by staff -- she is the Communications and Community Relations Manager, who started in September 2015 and was present a year ago.

David Snopek has been recently promoted within our organization and he is our Environmental Health and Safety and Regulatory Manager and he came into this role in April of 2016 after Paul Desiri moved on to a different part of General Electric.

So today we are going to present the midpoint operational performance summary, which is Condition 4.5 of our licence.

So GE Hitachi, we have more than 60 years of experience in the supply of nuclear fuel, fuel channel components, services, equipment and parts for the CANDU nuclear industry. We employ approximately 350 skilled employees at three locations in Ontario: Peterborough, Toronto and Arnprior.

We operate two facilities under this licence and those facilities are the Toronto location where

we have the pellet production and in Peterborough where we have the bundle assembly and services operations, and today we are going to walk through all 14 of the safety and control areas since this licence in 2011.

To start just with the management systems, our quality assurance for licensed activity policy was approved by the CNSC in May 2010. Since then, you can see the progression across the three pillars to where we are today.

Actually in 2015-2016, most notable are the changes to the critical-to-safety program which is now in place, improvements to our preventive maintenance and management software system, and also the systematic approach to training, which was already mentioned.

Just a comment on that. We currently have 17 procedures that are in place for training to the SAT approach, being in areas around safety and different elements of safety, first aid training, like that.

Also on management systems here, we have had, as previously mentioned, significant improvements to the public information program, the 29-point plan, which we are happy to say all of those items were completed in 2015.

We have filled the Senior Manager role and the main focus here has been on the community, community newsletters, outreach, barbecues, getting out and more

community involvement, especially in the Toronto area.

On this slide here you can see sort of in chronological order the improvements that have been made, simply from having a 1-800 number through to a standalone website, the Citizen Liaison Committee in 2013, and we did hold our first community barbecue in 2015, at which the CNSC was present and we have continued to do that in 2016 as well.

As previously mentioned, we are compliant now with REGDOC-2.2.2. And some of the other training that's involved here was fuel shop, hazardous awareness and critical safety training. So we continue to develop this now and we have identified 23 courses that we wish to put under the SAT.

In terms of operating performance, the facility is operated in accordance with the operating licence and our own internal programs. We are in compliance with production and possession limits at both locations and we perform routine operational reviews within the business across all of our locations.

For safety analysis, we have updated our safety analyses for both sites and they are on file with the CNSC, that was done in 2012, and any proposed modifications are assessed through our internal change control program.

Recently, there was a revision to the Peterborough Safety Analysis Report to allow us to store powder onsite at our Building 24 and that was done in 2013.

Physical design. There have been numerous designs to the facility, you can see a list there under the significant facility modifications, but all of these modifications to the facility were made in accordance with codes and change control and there were no major modifications that occurred that affected the safety analysis of the facilities. A lot of these were continuous improvement and in the early stages of 2011 they were more growth-related for the business.

Fitness for service. Routine preventive maintenance program was upgraded, as mentioned, to Maintenance Connections. Maintenance Connections is a web-based maintenance management software program that allows us to maintain equipment, information regarding equipment, facilities and manufacturing, and we can use it across all three of our facilities.

The critical-to-safety program is in its implementation phase, but the main part of this was to identify a critical-to-safety list and components both from a quality and from an EHS standpoint and make sure that those items were identified and recorded appropriately on the preventive maintenance program.

Under radiation protection, we have well-established radiation protection programs that are currently in place, with internal control and action levels. We use the ALARA approach for continuous improvement and we have very active ALARA committees at both of our sites. They meet routinely to discuss doses, air sampling swipes, also set goals for the year at both locations, and we are in compliance with all regulatory dose limits.

This next slide I will just note it is on a logarithmic scale just to show the data.

But overall, if you look at the red line, the overall average dose trend is flat for the Peterborough location, with maximum dose trending in a downward direction and well below the regulatory limit.

The Toronto total effective dose equivalent, similar, it's also on a logarithmic scale, just to identify that, but the red line for the average, the overall average and maximum dose trend is flat as well and again well below the action level and regulatory limits.

This slide covers three -- we have had three action level exceedances since 2011. They are shown on the table below. What it shows to us is that it does demonstrate that our action levels are effective and they are identifying areas where we can take corrective actions.

And we have reported these and completed the investigations as required and we have put corrective actions in place for all three of these occurrences.

Under conventional health and safety, we are happy to say that we have actually only had two recordable injuries over the five-year period, of which two of them did involve lost time, and they date back, as previously shown, to 2012 and then 2014, but we are happy to say that last year we did not have any lost time injuries.

We are also working on -- we have had a large machine guarding improvement program which has been in place since 2012. We had a third party come in and do an assessment across all three facilities for machine guarding and we have created a list, basically a triage, sort of an A, B, C list, and we are continuing to work towards that to mitigate any traditional health and safety hazards, especially in the mechanical areas.

For environmental protection, we are in compliance with all regulatory limits. We maintain our ISO 14001 registration. And as always and as mentioned, we use the ALARA approach to continuous improvements. And recently, in 2015, we replaced our beryllium settling tank at the Peterborough location and we also have environmental TLDS in place at our plant boundaries.

This slide covers the Peterborough location. Peterborough uranium emissions both for air and water, again note this is in a logarithmic scale, but they were just -- notice the scale because the values are so small relative to the limits to show the data. But overall, the five-year trend of our annual air and water releases shows a stable performance consisting of very low releases which are well below the licence release limits.

A similar trend can be seen for the Toronto location. So for Toronto uranium emissions both for air and water, a similar trend to Peterborough, which is showing stable performance.

Peterborough beryllium emissions. I just want to note under air that we are talking in micrograms and the data is .009. In 2015, there was a spike, it was up to .009, but an extremely small number. But if you look at the red line, the average concentration in air, it is still a stable trend.

For water, you will see the spike at 65.5 in 2015. Overall, the trend is good. That was due to one incident when we were cleaning our furnaces. So we have these furnaces where we take beryllium and deposit onto our substrates and we clean them out about four times a year. When we performed this one cleaning, the ventilation system, the baffle was closed on it. So normally when we

are cleaning it, the particulate would go to the HEPA filter, and in this particular case there was just more air contamination than was in the room, and then when we clean the floor, that's where it gets picked up in the water. This happened in one 24-hour sample reading. Since then, we have done six other cleanouts and all of the levels have been below 3 mcg/L.

I will note that currently there is no regulatory limit on beryllium. We are working with the CNSC and going to suggest an appropriate action level for that in the upcoming weeks.

Soil sampling. Soil sampling is taken from surface, retrieved from 49 different locations around the plant at the Toronto location each year. There have been numerous studies done back in 2013 and all of those studies are posted on our website. The independent Ministry of Environment soil sampling was done at the Toronto facility, it was performed in 2013, and there were no issues found where we were out of compliance with our soil sampling.

The next one is, yes, the estimated radiation doses to members of the public and as you can see here we are well below the regulatory limit of 1 mSv and typically a flat trend.

Emergency management and fire protection

improvements. Below, you can see a continuous list of improvements. So we are continually making improvements, both at the Peterborough and Toronto facilities. I won't go through them in detail here, but I also just want to say that emergency response plans fulfil the CNSC operating licence requirements, regulations, standards and any guides that have been provided to us.

Waste management. All hazardous and radioactive waste is safely shipped to licensed sites and bulk uranium waste is returned to the supplier for recycling. We are compliant with the Ontario Waste Regulation 347 and we also perform annual waste audits and waste reduction work plans at the Peterborough location.

Nuclear security, this is another area where we have made some improvements, particularly at our Toronto location. The Toronto location currently has a fence that goes all the way around it. We have added 24-hour, seven-day-a-week guard presence. We have also implemented the guard house which is there and the guards also go and do rounds at that facility as well, but I am pleased to say that there have been no reportable security events at either site.

In terms of safeguards, we have well-established programs in place. We have adopted the RD-336 Accounting and Reporting of Nuclear Material, and we

have routine inspections and inventory by the CNSC and the IAEA.

Packaging and transport of nuclear substances, we did have one occurrence. It was one instance of an inaccurate shipping documentation for a shipment from Peterborough to Toronto. We use containers that transport the pallets from the Toronto location to the Peterborough location. In the transport of those containers, they should be empty going back to Toronto. There was a mistake, where one of the pallets went back and it had material on it. So that material was not identified with the correct UN number. We did a formal investigation and put preventive measures in place, and notified the CNSC of that instance.

The other thing I'll say on that is when the truck arrived at our Toronto location and they unpacked the truck, they were the ones that noticed the deficiency, and then immediately internally we were able to address the situation.

For concluding remarks, our current safety programs are effective and robust, resulting in a long history of safe and compliant operation of GEH-C. There have been no environmental issues or impacts to the environment or public throughout the licence period.

At this point, as previously mentioned, we

were going to talk about the fact that our business has been acquired and it's in an open deal with BWXT. We have applied for a licence transfer, which is associated with the sale -- it's one of the three regulatory requirements -- and we're expecting that to come through, and the business closed probably in the December time frame.

But I'll go to the last slide and just summarize a bit.

BWXT. The announcement was made public to our employees and to the SEC and to external communications on August 18, 2016. We are being acquired by BWXT, who are an American-based facility out of Virginia. We will report in to BWXT Canada here in Cambridge.

As I said, there were internal and external communications. We've put through the request for a licence transfer. The main thing here is that the current management staff, myself, and the employees that work for me, are all going over with the company, and we will continue to operate to the licence conditions, as we have in the past, but under the BWXT name.

We remain committed to the compliance and regulatory and licensing requirements, and we continue to strive as a management team and as a business, to become a world-class facility.

Thank you.

**THE PRESIDENT:** Thank you.

Okay, just to complete all the lists of intervenors, we'll start here with a written submission from Northwatch, as outlined in CMD 16-M43.4, and that will start us on the question period on all the submissions we just heard.

So go ahead.

Dr. McEwan?

**CMD 16-M43.4**

**Written submission from Northwatch**

**MEMBER MCEWAN:** I'll start with Northwatch, because they brought up a couple of issues that I thought might be relevant, particularly with respect to a couple of gaps I felt were in both the presentation and the report.

One was really related to the relationships of the Blind River Refinery and the MFN engagement and future engagement. There were no details and, there, I felt that there was sort of a lack of detail of what was achieved, what was discussed, and, more importantly, what did it lead to going forward in terms of continued contact, continued information-sharing.

**MS MURTHY:** Kavita Murthy, for the record.

There have been a number of meetings with the community, and both Rob Buhr, Adam Levine and Kiza Sauvé have been involved. So I believe Kiza is ready to respond to this question.

**MS SAUVÉ:** Kiza Sauvé, for the record.

I'm the director of the Environmental Compliance and Laboratory Services Division.

As part of the independent environmental monitoring program, before we go out to facilities we send notification letters to the municipality for licensees, as well as indigenous groups in the area. Before we sampled at Blind River a few years ago, we sent a letter out and Mississauga First Nation responded to our letter, asking us for more information on the independent environmental monitoring program. So myself and some of my staff joined the licensing team and we went up and we provided the lands and resources committee some more information on our independent environmental monitoring program and what we do and where we take samples.

From that meeting, the Mississauga First Nation asked us to come back and give them a little more information on how our program might correlate to their program, because they do some of their own sampling. Actually, Mike Jones went up and walked their site with

them to see where our sample points might be similar to their sample points, and if we could look at maybe harmonizing some of our sampling.

The result of that is next year, in 2017, we're planning to sample again at Blind River, and we've adapted our plan a little bit, taking into account their suggestions and information.

**MEMBER MCEWAN:** So this will be an ongoing relationship, and you'll try and build on it, both in terms of the sampling, but also in terms of general information around the refinery?

**MS MURTHY:** Kavita Murthy, for the record.

Yes, it will be. I'd like to ask Adam Levine, who is in Ottawa, to speak to it. He's our specialist on aboriginal consultation.

**MR. LEVINE:** Thank you, Kavita.

This is Adam Levine, for the record.

In addition to what Ms Sauv e has provided, the relationship with Mississauga First Nation is very important to us, as they are adjacent to the Blind River facility. Whenever our inspectors are up in the region, whenever we're doing environmental monitoring and sampling, and whenever we're up in the region for other reasons, we always extend the offer to meet with the Mississauga First Nation.

We meet with them on a regular basis each year, and we also provide them regular updates. For example, this regulatory oversight report, we made sure that they had a copy of it and had the opportunity to participate. Unfortunately, they didn't have the time to participate this year, but they are committed to participating in next year's report, and commenting on it.

We always offer participant funding so that they have the capacity to review these reports and help provide honorary and other funding to cover expenses related to hospitality and housing, and keeping us informed of what they're doing. So it's important to ensure that they have the capacity and that they're well informed.

**MS MURTHY:** Thank you, Adam.

Kavita Murthy, for the record.

I'll ask Rob Buhr, who's the project officer for Blind River Refinery, if he has anything to add to this.

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

We've been going up there for other projects as well that are going on in the communities of Elliot Lake, so we're trying to keep informed of activities that are going in that region as well.

There is also a project going on for a repository of waste as well, called the APM Project. So

we've been going up and presenting, you know, how CNSC would regulate that type of facility if an application did come to us.

**MEMBER MCEWAN:** This relates to the discussion we had this morning around the potential plan to ship waste to the Blind River Refinery?

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

It's called the Adaptive Phase Management Project, which is high-level waste being sent from the NWMO. It's a separate related project completely.

**THE PRESIDENT:** Ms Velshi.

**MEMBER VELSHI:** I'd like to go to page 19 of Northwatch's written submission, where there are concerns expressed about the CNSC's IEMP and the robustness of the program.

I'd like to get staff's comments on the concerns here around adequate statistical analysis and sampling, but, more importantly, also, has this program been reviewed or assessed by any third parties for its design and execution?

**MS SAUVÉ:** Kiza Sauvé, for the record.

The CNSC independent environmental monitoring program is not intended to replace the licensees' environmental monitoring program. It's meant to complement and assist ongoing compliance activities. The

sampling that we do, it is a once -- you know, it's a three-day event when we go, and it is once a year, or maybe once every two or three years. So it's not meant to be a robust program that would be for trending.

At the moment the program's been in place since 2012, so we are attempting to get a three to four-year baseline for the major facilities. At this time there hasn't been any outside review of the program. That's where we're at now, but we're always looking for continuous improvements and we always take comments that we get from intervenors or indigenous groups into account to try and improve the program.

**THE PRESIDENT:** The program is only about, what, two, three years?

**MS SAUVÉ:** 2012 was the first year, when we did a pilot project in Chalk River, so about three years.

**THE PRESIDENT:** But normally you don't do that a program review around once every five years. That's the normal kind of a process.

**MS SAUVÉ:** Kiza Sauvé, for the record.

Yeah, I would add it's really a spot-check verification, and we count on the licensees' environmental monitoring programs that we review and assess and inspect against as the robust monitoring program.

**THE PRESIDENT:** So what's the concern? What do you read in Northwatch's concern with the program?

**MS SAUVÉ:** Kiza Sauvé, for the record.

The concern could be -- I don't want to speak on behalf of the intervenor -- is that -- our information is publicly available on the dashboard, and so looking at the data available, it's difficult to do trending because it's not a long -- you know, there's not enough data to do any kind of trending.

So that could be the concern, but I can't speak on behalf of the intervenor.

**MEMBER VELSHI:** I guess I'm trying to understand how much comfort we can take from the results of the IEMP over time, and if it is spot checks, and, you know, there can be so much fluctuation, and so if you saw a high number, you know, should alarm bells ring? How do you qualify your results so that people don't give it more credence or more weight than the numbers deserve?

**MS SAUVÉ:** Kiza Sauvé, for the record.

I'll start with an example. And I won't give details of the licensee. We're about to publish this data very soon, and you'll probably -- you'll hear about it in December.

In one sampling, we did find a datapoint that was higher than CCME guidelines, the environment and

public is still protected, but it's in an area where the licensee was no longer monitoring. Their environmental monitoring program had recently been shrunk. It's a facility that's in storage and surveillance.

Due to this spot check that we had done, in discussions with licensing, that licensee is now required to augment their environmental monitoring program based on the spot check that we had done. In that sense, those are the spot check.

When we review the data, although the sampling points aren't necessarily the same as the licensees', we look at the range of the results that we received and we look at the range of the results from the licensees' sampling programs to ensure that they're in a similar range, and then we can have those discussions with licensees if it's not. It's kind a way to inform the compliance program.

**MEMBER VELSHI:** It really complements it is what you're saying.

When the Ontario Ministry of the Environment does its -- and there's some mention made here of stuff they have done historically -- how does their environmental monitoring program compare to the IEMP? Do you know if they have done any more recent sampling of sites around Blind River Refinery?

**MS SAUVÉ:** Kiza Sauvé, for the record.

I believe the Ministry of the Environment and Climate Change sampling program that you're referring to is the air and foliage monitoring program. Actually, it's unfortunate it's coming up today, because the gentleman from the MOECC, that actually runs that program, has been here for the last two days, but he's not here now. In discussions with them, they do their sampling once a year, and their purpose is for background trending. Based on the discussions, actually, that I had with them today, we're going to be working with them to use their data to inform our program for our background levels. But that's my understanding of what their program is for.

I just want to remind the Commission, as well, that the monitoring and environmental monitoring is the responsibility of the licensee.

**MEMBER VELSHI:** Thank you.

**THE PRESIDENT:** Go ahead.

**MR. McALLISTER:** Just to complement what Ms Sauvé said, what she referred to was some of the MOE monitoring in the Port Hope area.

With respect to the Blind River area, where I believe, Ms Velshi, your comment was coming from, the Ministry of the Environment has been doing soil surveys in that area since 1981, and so it's been an ongoing

program that they've had in place. Most recently, they published findings in 2013 which confirm CNSC's observations regarding the result of uranium in the soil in and around the Blind River Refinery site.

**MEMBER VELSHI:** I found the reference to the Ministry of the Environment report, and this is the 2007 report that they make mention, where it says "Uranium concentrations have increased during the operating period of the Cameco facility."

And then there is the 2012 report, I guess. But do you know how often they do their sampling?

**THE PRESIDENT:** They're not here now, but Blind River can help us with this, because I know that they have a program, and they do it on a cyclical basis.

While you are trying to find the information on that, in the reports attached to Northwatch, they make a statement about the ECAs -- this is an environmental compliance report -- that has to be reported publicly. So the report claimed, I think, that Cameco and CNSC, and I assume the Ministry of the Environment, should do a better job of posting this information.

So help me with that.

**MR. DEGRAW:** Joe Degraw, for the record.

First off, the Ministry of the Environment does soil sampling approximately every five years for Blind

River. There may be some times where it's slightly longer and slightly shorter, but, in general, as I say, 2007, 2012. We would expect them within the next year to do another campaign, and they do notify us when they are planning to do that.

With respect to your comment on the ECA, I believe what you're referring to is the emission summary dispersion modelling report. There's a regulatory requirement in the province that a summary of that report has to be made available to a member of the public, should they request one. It also has to be made available during business hours if somebody shows up and requests to view it.

So that is the requirement, I believe, that they're referring to.

**THE PRESIDENT:** I think they're claiming -- it says, quote, section condition 10.3, to make this available to the public. Presumably they complained because they couldn't get access to this, if I'm interpreting...is that correct or not?

**MR. DEGRAW:** Joe Degraw, for the record.

No. To my knowledge, I don't believe they've ever asked us for that report. The wording in the regulation is the report has to be made available if they come to the site and request to review it. If they make a

written request, we have to provide it within 15 days. There's also an option for posting on the Internet, but it's not a requirement.

**THE PRESIDENT:** Ms Velshi, I interrupted you.

**MEMBER VELSHI:** I'm okay with that one.

**THE PRESIDENT:** Okay.

Dr. McEwan, go ahead.

**MEMBER MCEWAN:** It's on soil sampling.

So the other question I had about the soil sampling, on page 54 of the CMD and page 198 of the CMD, staff says that the results for all samples were below 23 micrograms per gram. If I look at the monitoring in 2010 and 2013, in 2010 the concentration was very close to the CCME guideline and in 2013 it was close to the CCME guideline. Where there is only a three-year monitoring cycle, would it not make sense to do that more frequently, given that the data that we have suggests that the values are actually very close to CCME guidelines?

**THE PRESIDENT:** Which one are you on?

**MEMBER MCEWAN:** I'm on page 198.

**MR. DEGRAW:** Joe Degraw, for the record.

Cameco does soil sampling annually, not on a three-year frequency.

**MR. SMITH:** Tom Smith, for the record.

Cameco Fuel Manufacturing does it every three years.

**MEMBER VELSHI:** I'll ask staff to comment on the level of public participation we have in the meeting today, or the lack thereof -- - and we've discussed this at other meetings -- especially since for two licensees it is their mid-term report. I know you've got this process of letting the public know that this is happening, that we're seeking input, and here's the annual report, but clearly that's not working. So what else can be done, or is this lack of interest, apathy, they're just happy with how things are going? Why would you think we don't have greater public engagement today in these three licensees' performance review?

**MS TADROS:** Haidy Tadros, for the record.

Maybe I'll start, and pass it to my colleagues, who are part of the participant funding program, to better articulate sort of the process that was used specifically in this case.

Again, my understanding of not only the public participant funding process, but the regulatory oversight reports as a whole, they are well recognized as our vehicle, from a staff perspective, to bring the industry together and provide better awareness of our oversight of the industry in a certain period of time

annually, and, as you saw in our presentation, we've done that for all the industries that are regulated.

I may presume to hazard a guess that it's not a lack of interest. I think it's always there, and I think there's always an opportunity. The information that is provided is meaningful and it provides a sense of what the previous year has involved and has looked at.

Maybe another presumption is that staff's CMD is a very well-written CMD, so the information that is needed is there.

We did hear today from a couple of intervenors that they felt the process for participant funding for meetings was slightly understood differently than potentially for public hearings. Maybe there is a bit of clarification that can be done there: that it is available to anyone, at any time, whether it be a hearing or a meeting.

But maybe with that, I'll ask Aimee Rupert to maybe hazard a guess on the process that was undertaken here, but also, going forward, if there are any improvements that staff can take back from this.

**THE PRESIDENT:** While Aimee is coming in, why don't we ask the licensees?

Now the community, you remember, let's say GE Hitachi, at one time you were very popular. Now how

come nobody's coming to this party?

--- Laughter / Rires

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

That's true, going back to 2013.

I think we've done a lot to get out to the community, and I think the community barbeque is the one that was mentioned in 2015 that we did in the fall. And then this year we just -- we had two more, we had one in Peterborough, in the Toronto location, both with over 100-plus employees, all walks of life.

We opened it up. They didn't take tours through the facility, but they came to grounds. There was barbeques. People would come with their kids. There was really no restriction. We had a good turnout and we had a good mix of people. We had a number of displays set up so they could walk around. We have a number of knowledgeable people on our staff that told them everything we did at the site and the facilities, pointed them to the web page. Community newsletters are coming out more frequently, more pertinent information, the community liaison committee as well -- just looking at one of my slides, community liaison committee as well is active. We're soliciting new members now, so that's out there as well.

So I think in Toronto they're relatively content. Peterborough, they've always been, you know, very

content. But we are out more than we ever have been in terms of the community, and it's been a positive response.

**MR. SMITH:** For the record, Tom Smith.

Cameco considers itself to have a mature Public Information Program. Locally, in both Port Hope and Blind River, we garner good public support as evidenced by our polling numbers, which we've shared with you in the last few days. We do have community outreach. We have open forums, ongoing dialogue with the Municipality of Port Hope, Blind River, and the Mississaugi First Nations. So I don't think it's a lack of interest of the public. I think they consider themselves to be fairly well informed, and hence they're not here today.

**MEMBER VELSHI:** Did you have anything to add?

**MS RUPERT:** Yes. Aimee Rupert, senior communications advisor, for the record.

I'll just provide an overview of how we do our advertising for the RORs and for the proceeding that happened here in Port Hope.

There was the notice of hearing went out on March 30th and again on October 17th to remind people of the proceedings and of the reports being presented. This is also sent out through our email distribution list, which has over 4,000 subscribers. And each time also we do a

Facebook and a tweet as well, which again has over 3,000 followers for both of those channels. So the message is being put out there. And there are advertisements also purchased in the Port Hope area. And relating to the RORs, we did geotargeting advertising with *The Globe and Mail* for those specific host communities. So we did put out the effort to inform the host communities about these reports.

**MS MURTHY:** Kavita Murthy for the record.

To piggyback on what the licensees have said, and to a large extent a lot of openness and transparency in communication on the licensees about the licence activity, CNSC has put in requirements requiring this information to be shared, and we have put in requirements on how they should be providing information to their stakeholder community. We have asked them through their implementation of the REGDOC 99.3 to go to their communities and get information from their stakeholders on how they would like to be informed. So there has been a lot of progress, we feel, that has been made on this in this regard by licensees, and it's probably partly due to that.

But we would like to have more participation. We will look at other methods of getting out to licensees and get them to be -- sorry, stakeholders,

the public -- and get them to be here more.

**MEMBER VELSHI:** As we get to providing longer term licences, and as you know, one of the unique aspects about our process is the public participation, one that we're very proud of and we say we are happy with longer term licences because the public will still have the same level or opportunities for engagement. And I just want to make sure we're not losing out on that. It's not in any way to take away responsibility that the licensees have of engaging their stakeholders; it's are we hearing as we would like to from members of the public. So I look forward to hearing from you after you've had more time to think on it.

**THE PRESIDENT:** Dr. McEwan.

**MEMBER MCEWAN:** So I think this is my last question on the Northwatch intervention. And this is something we've discussed at several meetings. And they comment again on the SCA rating system and the relative opacity of how the final assignment of the rating is arrived at. And they make a couple of comments around clearer linkages, greater transparency, how do you actually make that difference.

And certainly, looking at the report on page I think it's 64, just to take perhaps an unfair example, but it's an example I think of why people struggle

a little bit with how these ratings are assigned. GE Hitachi have gone from fully satisfactory for four years to satisfactory in 2015. Northwatch make a comment about satisfactory being maintained despite some exceedances. I think it would be very helpful to have, you know, SCA Ratings 101. It would help people understand how you arrive at the figure.

**MS TADROS:** Haidy Tadros for the record.

Yes, thank you for the question. And so basically to walk through our current approach to setting ratings for our safety and control areas, I'll start by drawing attention to staff's CMD where the definitions of the ratings on page 170 are defined. That obviously gives a very high definition with regards to the words chosen of meeting expectations, exceeding expectations.

But with that, I'd also like to bring reference to a bit of what has already been presented through the presentation when we come to talk about performance. So we recognize there's a series of compliance activities that are conducted by CNSC staff, not only for one licensee but for every single safety and control area.

And if we take the example of fitness for service, which we heard about this morning, there are several specific areas within one safety and control area.

And for every safety and control area, for every specific area found within, there are a series of regulatory requirements either found in regulatory documents that are being implemented, through licensees' documentation that have been submitted and have been reviewed.

So when CNSC staff look at compliance activities in the breadth of the documentation that is available, the regulatory framework that sets out requirements for every specific area, that is one element and one component of how staff look at licensees' performance.

The second element that is used is events. So obviously, things happen. Events do occur. That is the reason why we have release limits, action levels -- to ensure that there is controls in place to ensure events do not exceed and do not harm people, the environment. So when an event does happen, a licensees' actions, a licensees' activities, what they commit to, how they correct them, the frequency by which they correct those non-compliances and their actions towards events all factor in and are another factor to how staff look at and rate a specific area within a safety and control area.

So to bring reference to a few other examples, we heard yesterday from Cameco Port Hope Conversion Facility an outstanding presentation on

conventional health and safety. And I think we all noted that they've gone above and beyond the awareness and the practice of the committees that are in place, the people that spoke to it.

There is another specific area within conventional health and safety, and it's with regards to performance, the actual number of lost time injuries that happen. Cameco Port Hope Conversion Facility had two lost time injuries. So their area, their specific area around performance was not stellar and hence why they did not get a fully satisfactory for that whole totality specific safety and control area; whereas if we look to Blind River, we've mentioned today that their performance in conventional health and safety is fully satisfactory. And again, the three specific elements within that safety and control area, they've demonstrated no lost time injuries, they've demonstrated excellent awareness of their conventional health and safety programs, and an understanding by staff and management of their roles within conventional health and safety. And hence, using expert judgment, using all of these factors into consideration, staff come up with a rating for every safety and control area. And it is a comprehensive analysis that is being looked at.

As the Commission is very familiar with

nuclear power reactors, they have a mathematical formula that they generate to come up with a rating around these safety and control areas. The breadth of data and the breadth of information that is provided for every reactor, for every walkabout, for every site visit is at a different level of metric than we currently have for the industries that you hear today. So today the depth of data that we have don't correlate to enough data and trends that we can put a mathematical formula together. We could potentially look to that, to make it a bit more transparent. But at this time, I think we do have an approach that works, that compares industry for what they are currently doing and the practices they currently have.

And maybe I'll ask to close off Mr. Andrew McAllister to speak to the environmental protection safety and control area that you heard about today.

Was it Andrew or was it Mike?

I'm sorry, it was our colleague Mike to speak to that. He can give you some details on why through this one inspection fully satisfactory became satisfactory.

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

If you like, I can give you more information on why the rating for GE Hitachi went from fully satisfactory to satisfactory in 2015. Okay.

Essentially in April 2015, CNSC staff conducted an environmental protection inspection at GE Hitachi Toronto and Peterborough. As part of this inspection, we put a lot of emphasis on looking at the air emission monitoring program at the facility. We were, among other things, ensuring that all emissions from the facility were either directly monitored or estimated.

During the course of our review, we found that three stacks from the furnaces of the Toronto facility were not being monitored for uranium releases. So as a result, we issued two directives to the facility to initiate monitoring of those stacks and to update values that previously had been reported.

The reason it went from fully satisfactory to satisfactory is although it was a deficiency in the atmospheric emissions monitoring program, the contribution from those release points was very low, and the overall emissions from the site were low as well. So it didn't pose a significant risk to human health or the environment, but it was a deviation from our expectations; therefore, we adjusted it from fully satisfactory to satisfactory.

**MEMBER MCEWAN:** So, again, this was perhaps the most difficult area for me to wrap my head around when I joined the Commission. And I can understand how the public would have difficulties in understanding

where the ratings sit.

I think it might be helpful philosophically to look at a way of crafting language that would provide some rationale for the rating, particularly as in, just in the Northwatch case, there were some exceedances -- or the Northwatch example, excuse me -- there were some exceedances. And you may wonder if that was an issue that would change the rating, recognizing that within any individual rating there's a spectrum, from what you describe, of compliance and maybe a weaker compliance. So I think to try and craft some language might be very helpful for the public as they read these reports.

**MS MURTHY:** Kavita Murthy for the record.

Yes, we will take a look at that.

I do want to point out that a single event or an action level exceedance in and of itself will very rarely result in us deeming that the licensee's performance in a single safety and control area was either unacceptable -- there are situations where that would happen, of course, but there are -- most of the situations, it would look -- it is informed by the actions, how quickly, how well the actions are executed, what type of actions are proposed, and how the licensee reacts once a non-compliance is identified.

A continuing non-compliance, a systemic non-compliance, a non-compliance that is a significant deviation from what we expect the licensees to do, these are things that would commonly result in a below expectations.

**MEMBER MCEWAN:** And I think that helps a lot in understanding the framework.

**THE PRESIDENT:** Ms Velshi.

**MEMBER VELSHI:** Just some additional clarification on GE's environmental protection.

So I'm not questioning your rating, more on how long had there not been reporting on those emissions from the stacks?

**MR. JONES:** Mike Jones for the record.

To the best of my knowledge, that had never been part of the data they had been reporting to us in their annual compliance reports.

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

We would confirm that. It was something that was picked up by the CNSC. And we've since done the calculations, and the contribution was estimated at about 3.6 grams, so it was a small increase, but it had not previously been tracked.

**MEMBER VELSHI:** And so it's not the magnitude that's of concern, it's an unmonitored emission

pathway that has been around forever, and it could be for any other facility. And I'm trying to understand the robustness of the management systems, the third party reviews. I mean, it could be something fairly severe. I mean, it could have been going on for 50 years and we could have had large exposures.

So it's not so much that the amount was low, but how did we even get here, and how did you not pick it up in the previous inspections, and what are the learnings from that? I think that's of much greater significance, and I'd like to hear more on that.

**MR. AMALRAJ:** Julian Amalraj for the record.

I'm the senior project officer responsible for the compliance and licensing oversight of GE Hitachi. I was also the lead inspector for that particular inspection that you're talking about.

I'd just give a bit of an overview in terms of the programmatic aspects of GE's compliance monitoring of the emission system. So GE has as part of their emissions dispersion modelling do model the three stacks that they did not monitor or did not report. They have a programmatic requirement that once every three years that they do not report these stacks that are continuously monitored, they would do a batch sampling to ensure that

their assumptions and the basis under which they don't monitor that are actually validated.

In this particular inspection, we did look at that data which was done in 2012 which was done by GE Hitachi. The issues that we had during the inspection was that the study was not formally done and was not appropriately documented. We asked for proof to demonstrate that the three stacks were low enough and not significant enough to not continuously monitor. That was one aspect of it. The other aspect of it, whether the values itself were significant enough that they should be reported to the CNSC as part of the overall value.

And GE was requested as part of the inspection to immediately monitor the three stacks for a three-week period and report the data. And based on the assessment of the data, CNSC staff concluded that for the immediate future that they would have to continue monitoring because the total contribution of the three stacks they did not monitor were around 20 percent. It was not like an order of magnitude or lower.

And at no point during the past CNSC staff or GE had maintained continuous monitoring or at least oversight over those emissions, and the available modelling and the periodic sampling data that they had provide us assurance that there was no fugitive emissions or anything

that would have impacted or that could have happened in the past.

So based on that information, we asked for them to back-calculated for the licence period for which currently they're covered. So they have reported data from 2011 to 2015, and going forward they have started monitoring continuously.

And the total impact was relatively small. Their total emissions were around 6 grams per year over a licence limit of 550 grams. And at 20 percent of 6 grams, the net result ended up being about another increase of 20 percent. So from a safety significance point of view, staff did not feel that it warranted a response more severe than what we did.

**MEMBER VELSHI:** Thank you.

**THE PRESIDENT:** So the lesson I get out of this, which is a positive lesson, that it's good to question all existing procedures and the way you do things on an ongoing basis. And if there's room to improve, absolutely. So I think that was a good lesson to be learned here.

I think I'd like to ask a question here, still on Northwatch and on groundwater. So some of you know that I'm always preoccupied with plumes and how plumes migrate to water. So somebody -- let's start with staff,

and then from Blind River people -- about does anybody monitor and make sure that the plume in the soil and the groundwater that is migrating toward the lake and the river is okay, and you do sample the water at the river to make sure that everything is within guidelines. So who wants to start?

**MS TADROS:** Haidy Tadros for the record.

I'll pass that to our colleague Shizhong Lei to provide the answers.

**MR. LEI:** Shizhong Lei.

The groundwater at Blind River facility has been carefully looked at by the licensee as well as the CNSC staff. And from the Northwatch's submission, it seems they are primarily concerned about one particular location of the groundwater monitoring at borehole 22.

And in fact, CNSC staff does review the annual reports and pay very careful attention to any trend showing up. And once we noticed some increasing trend, we engaged the licensee and asked them to do more investigation. They came back with an explanation that it was primarily caused by some years ago they stored some empty drums which might have some uranium in it. And it's very isolated. It's not showing a plume migrating. It is just at that particular location. And in fact in this year, in 2016, August 2016, this number has dropped to

under 10 micrograms per litre.

**THE PRESIDENT:** And what is it in the water? The nearest water to the facility?

**MR. LEI:** There were several creeks that have sporadic flow when it's raining. That drains to a little creek there. And Cameco has been monitoring the water quality in those creeks. There is just one location right near the fence -- outside of the fence but still within the property of Cameco that shows a little bit occasional high concentration of uranium. But it's still far from the creek downstream.

**THE PRESIDENT:** But I'm interested in the downstream. I'm interested in the lake or in the river. I can't remember the name of the river right beside Blind River. Maybe Blind River can help us on that.

**MR. ASTLES:** Chris Astles for the record.

We do have a number of boreholes that do surround the property, both upstream and downstream of the facility monitoring the groundwater flow basically under the facility, and we do semi-annual sampling of these boreholes to get collected data from the water flow. And the boreholes are not showing increases.

We do present the data of the borehole analysis. The reference to borehole 22 is a sample

stationed directly outside of our calcination area where we're doing the drum cleaning.

We went through a campaign once we installed our drum cleaning decontamination circuit where we were able to clean, decontaminate and dispose of over 300,000 drums. Through that process there's a large amount of activity or traffic in that specific area by that borehole. Through the investigation, once we realized the numbers were starting to trend up, we were able to determine or suspect that the groundwater or the source to the groundwater was because of that activity, and water pooling by that borehole against the building where there's an expansion joint.

We also do regular testing and inspections of our sumps and trenches in the facility to make sure there was no leakage from the plant itself. So that's how we were able to come up with that determination, that it was from the increased activity. We've continued sampling that borehole and the numbers are definitely trending down.

**THE PRESIDENT:** Thank you. Still on groundwater and, in fact in all units, I don't know if you were paying attention to the kind of discussion we had with the Port Hope Area Initiative about what kind of guidance we should have for uranium. Because still in some of the tables in the back of the CMD, like uranium discharged to

sewer for GE is 9,000 kilograms here.

I think, staff, you may want to, just for the record, remind everybody that you're moving to augment this with toxicity numbers. That should go across to everybody. You want to say a short reminder of what we already discussed before?

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

So previously, we had set release limits for uranium, but based on a dose limit of or dose constraint of 50 microSieverts per annum. For the Port Hope Conversion Facility, we've adjusted that to account for the protection of aquatic life, so making sure that that release -- the point of control is at the facility and that the concentration of uranium is what we'd be looking to have as a release limit, action level, an added concentration that would be protective of aquatic life.

**THE PRESIDENT:** Thank you. More questions?  
Ms Velshi.

**MEMBER VELSHI:** Slide 18, staff slide 18. So with your footnote where you go, "Ambient air monitoring is not required for GE Hitachi Peterborough." So have you, GE Hitachi, have you stopped your air emission monitoring or do you do it less frequently as a result of this? Sorry, ambient air.

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

It's checked at the stack.

**MEMBER VELSHI:** So no more ambient air monitoring then?

MR. WARD: No, that's correct.

**MS MURTHY:** Kavita Murthy, for the record. So it is only for the one location, and I believe Mike Jones is here to give a little bit more precision.

**MR. JONES:** Mike Jones, for the record.

Yes, I just wanted to confirm what was already said for the GE Hitachi Peterborough. The emissions are so low there that the Ontario Ministry of the Environment and Climate Change air standard is met at the actual stack instead of the point of impingement, the fence line, which... So it's not required to have additional ambient air monitoring at that location.

**MEMBER VELSHI:** Thank you.

**THE PRESIDENT:** So while we've got you on this, just explain again, why is there no limit for beryllium? Is that no limit of radiological limit or toxicity limit? What is the limit you're looking for?

**MR. JONES:** Mike Jones, for the record.

So further to previous discussions, the CNSC considers contaminants of potential concern which need monitoring, which need release limits, and which need

action levels. Traditionally, at the GE Peterborough facility beryllium releases have been extremely low. The air releases have been below the Ministry of the Environment ambient air standard for beryllium, and liquid releases have been below the internal control levels which GE set, which are comparable to international drinking water standards. So release limits and action levels were not set.

However, the event that GE mentioned in the presentation caused CNSC staff to take action and GE staff to take action. So currently, action levels are being developed for both air and liquid releases of that facility.

**THE PRESIDENT:** But you just said there are international standards. So I don't care about whether it's a limit or guidance, but to understand whether 65 micrograms per litre is good, bad or otherwise, without any limits that doesn't mean anything.

**MR. JONES:** Mike Jones, for the record.

In Canada there is a provincial water quality objective of 11 micrograms per litre, so that would be the comparison for the sewer releases. So the 65 would be comparable to that number, but that number will be compared to the value after dilution added to by going into a sewer system and entering a mixing zone. So that would be

the comparison for that.

For the air, the comparison would be to the MOE value, which is 0.01 micrograms per cubic metre.

**THE PRESIDENT:** Here, we're talking about after dilution. I'm talking about effluent limit.

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

So as a comparison, we talked about uranium releases, and the Lake Ontario Waterkeeper suggested that a design objective or a release limit of .15 milligrams per litre would be acceptable. The reason they did so is because the level in the water for the protection of aquatic life was .015, so that factor of 10 is an appropriate release limit for entering into a water body because there is a mixing zone to be expected.

So if we applied that same rationale, which is standard rationale under the CCME rules, to the beryllium, if you took that factor of 10, you would be below the 11 micrograms per litre that is for the protection of aquatic life in Ontario.

So as a comparison, while it was a high value and it's not something that we would expect, and we're going to add action levels to make sure it doesn't happen or it's reported, even though that high level was still protective of aquatic life.

**THE PRESIDENT:** Look, I'm slow, I'm very

slow. Can we look at slide 19 of GE Hitachi? Okay, are we there? So the numbers, the 2015, 65.5 micrograms per litre.

**MR. RINKER:** Correct.

**THE PRESIDENT:** What would be the guidance limit?

**MR. RINKER:** So that is in the sewer, there would be a factor of 10 to take account for once it actually reaches the water body, so divide by 10, and we would say 6.55. That is compared to 11, which is the value for protection of aquatic life.

As the sewer water, which doesn't have fish in it, enters into a lake or stream, there's a factor of 10 that would be accounted for for the protection of aquatic life.

**THE PRESIDENT:** You got that? I thought this would be the reverse, you would factor the 10 up, it would be 650.

**MR. RINKER:** Working backwards, it would be 110 would be the limit we would put on that.

**THE PRESIDENT:** Okay.

**MR. RINKER:** Yes, that's working backwards.

**THE PRESIDENT:** Now I'm with you. So is this 110 as some standing internationally?

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

So, no, we just calculated quite quickly now, but it's based on the provincial water quality objective is 11 micrograms per litre, that's in law. To set a limit, you would multiply that by 10 and get to 110.

**THE PRESIDENT:** Okay, that's fine. So you can derive an appropriate limit for this particular chart. Okay, so I think you know what you need to do for the next time. Thank you.

Ms Velshi.

**MEMBER VELSHI:** So I have a couple of very quick questions for Cameco Fuel Manufacturing on your three incidents that have been reported for last year.

So on the lost time injury when you said it was a contractor working in a tight space, got up, bumped his head. You said the key contributing factor was contract management. I was just surprised by that. Maybe you can shed some more light on that.

**MR. JENSEN:** Thank you. Doug Jensen, for the record.

When we reviewed our contractor management practices one of the deficiencies or opportunities we found for improvement was really in the ability of our contractor managers to identify these hazards ahead of time. So that did fall under the umbrella of contract management, but --

**MEMBER VELSHI:** But it was around hazard

identification.

**MR. JENSEN:** -- it's job hazard analysis, yes.

**MEMBER VELSHI:** Thank you. Then the two radiation protection ones. One was the internal dose, the other was, and you say it was a respirator fit issue or facial hair. So maybe I can get staff to comment on that. So for your respiratory protection program, isn't clean shaven not a requirement or respiratory fitness program not part of that?

**MR. JENSEN:** Doug Jensen, for the record.

Again, the opportunity we found in this investigation, which is fairly in-depth, is that we had a practice that was in place, it was neither sanctioned by the procedure, nor was it not. But if an employee had facial hair when they did their respirator fit test and they passed with that facial hair, they had the impression that that was okay to have that facial hair during practice.

The problem during actual practice was the line management who's responsible for the safety of these employees has a difficult time discerning what acceptable facial hair is. So we went back to the CSA's 94.4 standard, communicated exactly what acceptable facial hair was by that standard regardless of the fit test implications. That

made it much easier for line management to be able to look around and understand who was compliant and who wasn't. So that was the big improvement that we made as a result of that event.

**MEMBER VELSHI:** So that seems like a fairly key learning that, you know, other licensees could benefit from. So is that fairly standard practice then, staff?

**MS MURTHY:** Kavita Murthy, for the record. I have Christina Dodkin, Radiation Protection Specialist, who will respond to the question.

**MS DODKIN:** Thank you. Christina Dodkin, Radiation Protection Specialist with the CNSC.

So we do inspect licensees respiratory protection programs and we do expect them to align with the CSA standard Z94.4 selection, use, and care of respirators. So in this particular instance the licensee is correct, that they did identify some deficiencies within their respiratory protection program. They did take action to improve that program, including clarifying requirements for appropriate facial hair to ensure that there is a proper seal.

CNSC staff did conduct a reactive inspection as a result of this action level exceedance, specifically to follow-up on all of the corrective actions

that were proposed by the licensee as a result of this particular action level exceedance. We found that they did take the appropriate action and the corrective actions were adequately implemented.

At the same time, we did identify some other areas where improvements could be made as well.

**MEMBER VELSHI:** So my question was more around learnings for other licensees. So when CNSC goes around inspecting others, is that something to say, hey, are you very clear on what's acceptable with regards to facial hair, having had this experience?

**MS DODKIN:** Okay, thank you. So, as mentioned at the beginning of my answer, so we do inspect the respiratory protection program, and actually I am the Radiation Protection Specialist for the uranium processing facility, so I provide that support on behalf of the CNSC.

So we actually inspected all three of Cameco fuel services divisions in 2016, and we did focus on the respiratory protection programs at all facilities. We did confirm that they are all aligning with the CSA standard, and it's well understood on getting a proper fit, et cetera.

I believe that Cameco also issued a safety bulletin following this event, and that's shared corporately as well.

**MEMBER VELSHI:** Thank you. The last one was around the extremity dose one where it was the TLD that had been pre-exposed. So does the dose then get corrected and amended in the records because it wasn't a true occupational dose?

**MR. JENSEN:** Doug Jensen, for the record. Yes. The dosimetry supplier has the responsibility of entering that dose into the NDR, the National Dose Registry, and they will enter the appropriate dose.

**MEMBER VELSHI:** Thank you.

**MEMBER MCEWAN:** So some quick questions. If I can go back to Cameco Fuel Manufacturing to my question about -- and I guess for staff also the soil monitoring results, Table F8 on page 198, you're the only site doing the monitoring once every three years. Yet, you have concentrations which are higher than all of the other sites who are monitoring annually.

So I guess my question to staff, is it appropriate -- and your use of English in the soil monitoring section on page 54 was very precise, it was accurate but it didn't really give a sense that these numbers were pushing the margins of the CCME.

**MS MURTHY:** Kavita Murthy, for the record.

Dr. McEwan, if you'll permit me, before we

go on to answer this question, I believe Christina has a little bit more precision on the previous question that we would like to make sure is reflected correctly. This is regarding the extremity dose. Then we will go on to answer your question. Thank you.

**MS DODKIN:** Thank you, Kavita. It's Christina Dodkin again.

So with regards to CFM and the extremity dose action level exceedance. So, yes, the worker's extremity dosimeter did record a dose of 151 milliSieverts. Following a series of investigations, it was determined that the dosimeter was contaminated and, therefore, self-irradiating, so a portion of that dose was not personal.

The licensee did propose a conservative dose estimate for the worker for dose to their extremities of 22 milliSieverts. This was reviewed by our dosimetry experts at the CNSC, and it was found to be acceptable. Therefore, that dose will be recorded with the National Dose Registry.

**MS MURTHY:** For the question regarding soil monitoring, Kavita Murthy, for the record.

I'll pass the question to Andrew McAllister.

**MR. McALLISTER:** Thank you, Ms Murthy.

Andrew McAllister, Director of the Environmental Risk Assessment Division.

I'll provide some high-level observations, and I would ask that Dr. Michael Ilin, who's back at headquarters, could provide a bit more precision, if needed.

If you look at the results, I think we have to keep in mind that when we're reporting values, and it's even applied to some of the Blind River Refinery things. For example, the Blind River Refinery reported minimum and maximums. In these cases, we've been reporting maximums along with the average.

The minimums and maximums have a few roles; one is to give a sense to the variability that may be associated with the information, with the data that's being collected. Because we do know that depending on the type of soil program in place, there may be variability between locations, between times of years and things like that. So that could all have an impact.

When we're looking at what is giving us an indication of the soil quality, averages are statistically significant and give us an idea of the robustness of their quality. With the Cameco Fuel Manufacturing results they're all very low, they're all, as you already alluded to, lower than the CCME guideline on residential and parkland use.

Nonetheless, like anything else, Cameco Fuel Manufacturing has a bit of the same challenges that the Port Hope Conversion Facility has; we have soil monitoring happening in an area that has some legacy contamination. So that might have a bearing somewhat in some of these maximum findings, and that's why with the VIM project, with the Port Hope Area Initiative project, there's a real opportunity to I'll say reset things and look at other opportunities to have soil monitoring locations that are based on clean soil and moving the monitoring forward from that.

**MEMBER MCEWAN:** So a couple of other just very small points. On page 47 of the CMD, at the bottom of the page, in the last paragraph you say, "a majority of ALARA dose targets were met." That means some weren't. So more detail would have actually been very helpful there or a correction of the use of English.

**MS TADROS:** Haidy Tadros, for the record. I'll ask Ms Christina Dodkin to elaborate on the choice of words.

**MS DODKIN:** Thank you. It's Christina Dodkin, Radiation Protection Specialist, for the record.

Yes, as indicated in Staff's CMD CFM did establish ALARA objectives and dose targets, and they do this annually. I would like to point out that they

establish these targets in accordance with their own ALARA processes in line with our radiation protection program, and CNSC staff do not have any input into these targets.

So, as mentioned, two targets were actually not met, and that is why staff used the wording in the CMD, particularly the targets for urinalysis and individual effective dose. However, they did establish other ALARA dose targets for different parameters as well that were met.

Regarding the targets that were not achieved, the first one was on urinalysis, so they were looking for a less than 8 per cent reduction from the previous years, which was not achieved. Then the target for effective dose was not achieved because of that incident where the worker received an acute intake of 5.7 milliSieverts, which actually drove up the total effective dose to 12.6 milliSieverts, which is above their annual effective dose target for the year.

So perhaps CFM may be able to comment more on how they derive their ALARA targets, but that said, we do look at their ALARA processes during our radiation protection inspections and ensure they are establishing meaningful indicators and initiatives.

**MR. JENSEN:** Doug Jensen, for the record.

I just want to support what staff has

said, is that the ALARA Group, it's a cross-functional team of employees that meets to try to drive down overall dose, and we set targets for that team based on history and what's achievable.

In both cases that the ALARA targets were not reached in 2015 are both related to that single acute uptake incident. So that individual received a total dose for the year that was above the ALARA target as well as the bulk of that dose, the unusual part, was in urinalysis, so both of those related to the same incident.

**MEMBER MCEWAN:** Thank you. So it would have been very helpful to have that in the CMD, because this stands out like a sore thumb.

The final comment I'll make is there are no action levels in any of the graphs where they're appropriate.

**MS MURTHY:** Kavita Murthy, for the record.

We noted that comment from yesterday as well. We will look into looking at where it is possible for us to put those in, so we have already taken that action.

**THE PRESIDENT:** Yes, just to reinforce, we will need this is in many many venues about explaining the units, the becquerels, the calculation kind of a thing. The more we do it on an annual basis, the more we have to have explanatory data here.

**MEMBER VELSHI:** A quick last one, and this is for GE Hitachi, it's something that we have raised previously with you about considering doing public opinion surveys. You look surprised. But may have been before your time. But certainly when we were in Toronto and after that, given the angst within your community at that time, and now you've come a ways and you actually have someone fulltime.

As you've heard from their licensees, it's part of their standard practice to do regular public opinion surveys to get information. Again, we'd suggest that you look into that and it would give you valuable insight into what people really think.

**MR. WARD:** Sure, we'll take that under consideration. I think, you know, with the successful move over to BWXT, we will propose that to their management and we'll look at what we can do.

**THE PRESIDENT:** I've got two very quick ones. One is why is GE selling? Are they getting out of the nuclear business? I don't want to put you on the spot, but what can you disclose?

**MR. WARD:** Sure. No, I'd say General Electric, on the whole, is not getting out of the nuclear business, they are still alive and well at our headquarter location in Wilmington, North Carolina, and also with Hitachi GE in Japan.

Ninety per cent of what we do is to service the CANDU reactors and the CANDU technology of which GE is not the design authority. GE is the design authority for BWR reactors, and that is the main focus, I would say, for General Electric, for BWR technology.

More recently, which is public knowledge, working with Russia and TVEL to supply PWR fuel into the U.S. market, so that's kind of their area.

I think right now, at the time, it's advantageous for us to move on with BWXT, given the mega project that's underway with Darlington, Ontario Power Generation, the first of four units to be refurbished. Then come 2020, the six units in sequence with Bruce Power. So it aligns our two companies really well to provide better offerings to those two utilities in particular.

I think it was just the change with General Electric in terms of its nuclear focus and it's a lot to manage an external site that has a different technology.

**THE PRESIDENT:** Thank you for that. The other question is, is your annual production level known in the public?

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

I would say, no. Our annual production level isn't known to the public. It is what we would

consider commercially sensitive information. There are only two fuel suppliers, and one's sitting next to me, so Cameco and ourselves, in terms of CANDU fuel production here in North America.

There are other fuel production facilities that are basically state or government -owned internationally. But, no, it is not information we would typically share.

**THE PRESIDENT:** I was just checking to see if you're telling it right.

--- Laughter / Rires

THE PRESIDENT: Okay. Any final...?

Okay, thank you. Thank you all. We will take a break for 15 minutes, and we'll proceed with the presentation, we'll go for Section 2.

Thank you.

--- Upon recessing at 4:04 p.m. /

Suspension à 16 h 04

--- Upon resuming at 4:20 p.m. /

Reprise à 16 h 20

**THE PRESIDENT:** So we will now proceed with Part 2 of the presentation on Section 2 of the report regarding nuclear substance processing facilities.

CNSC staff, please continue.

**MS TADROS:** Thank you, Mr. President, Members of the Commission. Haidy Tadros, for the record.

So for this next section that relates to the performance of the nuclear substance processing facilities in Canada, I would like to pass the presentation on to Mr. Robert Buhr, our project officer.

**MR. BUHR:** Good afternoon, Mr. President, Members of the Commission.

My name is Robert Buhr. I'm a project officer in the Nuclear Facilities Process Division.

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

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

The products created by nuclear substance processing facilities have a variety of end uses such as diagnosing and treating cancer, sterilizing single use medical equipment, and creating self-luminescent emergency 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 (Canada) Incorporated is a health science organization that manufactures gamma sterilization irradiators for the large scale irradiation of food, medical equipment and cosmetics. Nordion also manufactures medical isotopes for diagnosing and treating disease.

Best Theratronics Limited manufactures telatherapy machines, self-shielded irradiators and small cyclotrons.

Both Nordion and Best Theratronics are located in Ottawa.

This table shows the licensing and compliance effort from CNSC staff in 2015. CNSC staff spent 566 person-days on licensing activities at nuclear substance processing facilities.

The licence for SRB Technologies and Nordion were renewed by the Commission in 2015.

Four hundred and ninety-nine (499) person-days were dedicated to compliance activities. This was accomplished through inspections, desktop reviews and through the review of licensee reports.

CNSC staff performed a total of nine compliance inspections at these facilities. All the findings resulting from the inspections were provided to

the licensee immediately in preliminary reports followed by detailed inspection reports.

All enforcement actions arising from the findings are recorded in the CNSC regulatory information bank to ensure all enforcement actions are tracked to completion.

The performance ratings for each safety and control area was determined by CNSC staff based on the results and observations from inspections and desktop reviews.

SRB Technologies' conventional health and safety program continues to be rated fully satisfactory in 2015 as a result of its consistent record of worker protection. CNSC staff also continue to rate SRB Technologies' fitness for service program as fully satisfactory as a result of improvements to its manufacturing processes and preventative maintenance activities. In addition, SRB Technologies' fitness for service program meets the requirements of CNSC Regulatory Document RDGD-210 titled "Maintenance Programs for Nuclear Power Plants" which defines requirements for nuclear power plants.

As such, SRB Technologies' fitness for service program exceeds CNSC staff's expectations.

Nordion received a rating of fully

satisfactory for environmental protection due to its continual small environmental releases and Nordion's commitment to the ALARA principle.

Nordion's security program was also rated fully satisfactory as a result of program enhancements.

Best Theratronics' emergency management and fire protection safety and control area received a rating of below expectation as a result of shortcomings identified during separate on-site inspections. This will be discussed further in the facility-specific section.

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

The graph on this slide shows the average of maximum effective dose to nuclear energy workers for the three facilities in 2015. The red line in this regulatory -- is the regulatory annual effective dose limit of 50 millisieverts for nuclear energy worker. As shown, the average and maximum dose received by a worker at each facility was well below the regulatory limit.

This slide provides the estimated dose to the public from each nuclear substance processing facility from 2011 to 2015. Dose to the public are conservatively estimated for nuclear substance processing facilities primarily by gamma dose rate measurements, air emissions

and effluent releases as applicable.

Note that the public dose estimates are not provided for Best Theratronics because its licence activities involve sealed sources and there are no discharges to the environment.

Estimated doses for the facilities continue to be well below the limit of one millisievert per year.

This slide shows the number of lost time injuries for the last five years. In 2015, there were no lost time injuries at SRB Technologies or Nordion, and one lost time injury at Best Theratronics.

As previously mentioned, SRB Technologies continues to receive a fully satisfactory rating in recognition of its consistent record of effective worker protection.

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

CNSC staff conclude that the nuclear substance processing facility licensee programs related to conventional health and safety were effective in protecting persons working in those facilities.

In the next few slides, I'll provide some

specific highlights for nuclear substance processing facilities in 2015, starting with SRB Technologies.

SRB Technologies' licence was renewed on July 1st, 2015 for a period of seven years, with an updated Licence Conditions Handbook. The licence is valid until June 30th, 2022. The SRB Technologies facility is located in Pembroke, Ontario, about 150 kilometres northwest of Ottawa.

SRB Technologies processes tritium gas to produce gaseous tritium light sources and also manufactures devices that contain these sources.

There were no significant process modifications to the SRB Technologies facility. However, SRB did make some facility enhancements to existing equipment such as the installation of remote display units to improve SRB Technologies' ability to identify upset conditions before they happen and the replacement of valve types on tritium traps to further reduce small tritium leakages.

There are no changes to the licence or Licence Conditions Handbook in 2015.

In paragraph 130 of the record of proceedings for the SRB Technologies licence renewal in 2015, the Commission requested that CNSC staff include in its annual reports more detailed information regarding not

only the number of shipments, but the volume of processed material as well as the number of signs that had been received and how much of that had been directed to waste.

As shown in this slide, SRB Technologies made 1,150 shipments containing about 28 million Gigabecquerels of tritium processed into gaseous tritium light sources and received 598 shipments of returned devices for reuse or disposal containing approximately 4.7 million Gigabecquerels of tritium.

In total, SRB Technologies sent approximately 4.3 million Gigabecquerels of tritium waste to a licensed disposal facility.

In paragraph 108 of the record of proceedings for SRB Technologies' licence renewal in 2015, the Commission requested that CNSC staff include in its annual reports a chart with details regarding groundwater monitoring wells. This figure provides the most recent average groundwater monitoring data near SRB Technologies.

As expected, the highest tritium levels in groundwater occur adjacent to the facility, and very low values are observed near residential areas and the Muskrat River. The concentration pattern observed in this slide is reflective of aerial deposition rather than groundwater migration. As it rains, the tritium in air is transferred into the groundwater and decays before it is able to travel

very far.

This means that the values in the Muskrat River are not expected to increase from what is observed today.

Tritium values in wells located in residential areas are near or below 200 becquerels per litre, which are well below the provincial drinking water standard of 7,000 becquerels per litre. These residences are connected to municipal water supply which is fed from the Ottawa River where tritium is near the detectable of five becquerels per litre.

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

SRB Technologies did not exceed any regulatory limits. There were no radiation protection action level exceedances or lost time injuries.

There was one environmental action level exceedance. The action level exceedance was due to the degradation of a valve and its operation during inappropriate point in the gas filling process. SRB Technologies' corrective actions include increasing the preventative maintenance frequency on process valves as well as incorporating procedural changes into their

systematic approach to training system.

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

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

This concludes this section on SRB Technologies. I'll now introduce and discuss Nordion (Canada) Incorporated.

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

The satellite photo on this slide shows the Nordion and Best Theratronics facilities, as they are directly adjacent to one another. The Nordion facility is highlighted in the red box.

Nordion's licence was renewed on November 1st, 2015 for a period of 10 years. The licence was issued with Nordion's first Licence Conditions Handbook, there being no major changes to Nordion's facility or its operations since the licence was renewed.

In paragraph 144 of the record of

proceedings for Nordion's licence renewal in 2015, the Commission requested to be updated on the disposal of three historical neutron sources from the facility. Nordion has been active in identifying an appropriate solution to dispose of the neutron sources.

CNSC staff issued Nordion a certificate for the package to be used in the transport of the source once a suitable disposal pathway has been determined.

In 2015, Nordion had no regulatory limit or action level exceedances. Nordion also did not have any lost time injuries.

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

This concludes the section on Nordion. I will now introduce and discuss Best Theratronics Limited.

Best Theratronics Limited is a nuclear substance processing facility that is located in Ottawa adjacent to the Nordion facility. The Best Theratronics facility is shown within the red box.

Best Theratronics manufactures medical equipment such as cancer treatment units as well as blood irradiators.

Best Theratronics was issued its first Class 1B licence, which included a new Licence Condition

Handbook, in July 2014. The licence expires in June 2019.

In 2015, there were no major modifications to the Best Theratronics facility that required Commission approval.

Two orders related to the financial guarantee and fire protection program were issued in 2015. I'll provide details of these orders in the following slides.

On August 24th, 2015, 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 its inventory of nuclear substances to minimize the liability of future decommissioning activities.

Best Theratronics has made progress on reducing its inventory of nuclear substances. At the same time, Best Theratronics has increased its financial guarantee to cover the costs of all sealed sources, prescribed equipment and depleted uranium.

In light of the reductions to their inventory, Best Theratronics has submitted a revised preliminary decommissioning strategy and proposed a new financial guarantee amount which is currently under CNSC staff review. CNSC staff expect that Best Theratronics will be fully compliant with the financial guarantee

licence condition by March 2017.

An inspector's order was issued to Best Theratronics in October 2016 after CNSC staff found non-compliances with the National Fire Code of Canada with respect to a dust collection machine. The order required Best Theratronics to cease operation of the dust collector to ensure that it complies with the National Fire Code of Canada prior to its use.

In response to the order, Best Theratronics installed a new dust collector and developed a housekeeping program.

On November 17th, 2015, Best Theratronics had completed -- complied with the order, the corrective measures implemented by the company were reviewed and found to be satisfactory by CNSC staff.

In 2015, Best Theratronics had no regulatory limit or action level exceedances. Best Theratronics did not -- did have one lost time injury where an employee twisted his knee while walking in the kitchen and supply area. This resulted in a one-day loss of time.

CNSC staff are currently satisfied that Best Theratronics has adequate measures to protect the health and safety of workers, public and environment. The situation with the financial guarantee remains an area of continued focus and CNSC staff are following up closely

with Best Theratronics to ensure that it is addressed by March 2017.

This concludes the performance review for the nuclear substance processing facilities.

**THE PRESIDENT:** Thank you.

So before we get into the question period, I'd like to see if there are any licensee from -- let me get back in there -- from SRBT, from Nordion and from Best Theratronics that I understand some of them are online.

Anybody wants to make a comment right now. Let me start with SRBT.

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

No comment.

**THE PRESIDENT:** Okay. Nordion?

**DR. BEEKMANS:** Rick Beekmans, for the record, Director of Environmental Health and Safety.

No comment. Myself and five members of my team are ready to answer any questions that you might have.

**THE PRESIDENT:** Best Theratronics.

**MS MASON:** Good afternoon. Samantha Mason, RSO for Best Theratronics, for the record.

No comments at this time.

**THE PRESIDENT:** Thank you.

Questions? Dr. McEwan.

**MEMBER MCEWAN:** We'll start with SRBT.

So in your deck, I really liked slide 54 because it gives a very good sense of the products that you make.

Just out of interest, what is a tactical device? The picture that you give gives no idea of what it does.

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

A tactical device is a device that are typically used by the military grounds troop, and the one that's picture here is a map reader or a device used to read maps or any documents.

**MEMBER. MCEWAN:** Thank you.

The second question relates to tritium concentrations. If I remember at the licensing hearing, there was a concern about the potential development of a plume going towards the Muskrat River.

And I just wanted to confirm from the picture in the CMD and the picture on the slide deck on slide 55, the flow is from -- the normal flow would be from the Best site down towards the river?

What did I say?

Sorry. SRBT.

**MS TADROS:** Haidy Tadros, for the record.

I'll ask Mr. Andrew McAllister -- this time I got it correct -- to answer that question.

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

Yeah. Just to confirm that the groundwater flow pattern is towards the Muskrat River and, as noted on that figure, the values are very, very low and we expect that to continue.

**MEMBER MCEWAN:** And there is no need for -- I mean, the highest level is on this picture below the building. There's no suggestion of the possibility of flow on this picture towards the bottom of the picture.

**MR. LEI:** CNSC, Shizhong Lei.

The staff conducted comprehensive studies regarding the behaviour of groundwater under the facility and around the site, and several years ago, CNSC staff did some analytical modeling of what the situation and they predicted the variation of tritium concentrations at that particular well which has been showing a high concentration of tritium.

And for the past six, seven years, the variation of tritium in that well and elsewhere are, indeed, behaving as the staff predicted.

**THE PRESIDENT:** So I remember this model that you presented. It seems like a long time ago. So you

said that the measurement if you actually -- the actuals follow the model.

So what I want to know is, the two wells right beside the building the high level, will they, over time, also be reduced?

Do you have any estimate as to how long will it take, or is it that because of the exhaust that it keep replenishing itself and it's not ever going to go down to, you know, lower level like maybe 7,000 becquerel per litre?

MR. LEI: CNSC, Shizhong Lei.

The monitor well under its MWO6-10, which is right under the stacks, so they have some -- during a normal operation, there will be some tritium from air to the soil right into that area. So according to our prediction, it's unlikely at that location the tritium concentration would go below 7,000. Our estimate is around three to four -- about 35,000 becquerels per litre, but it's very static.

If you look at the -- all the monitoring wells, you will see that the groundwater is flowing very slowly from the site to the river. By the time it reached the river, it's under -- it's below the -- it would be below the detection limit.

**THE PRESIDENT:** Thank you.

Ms Velshi.

**MEMBER VELSHI:** So I don't have any questions about SRBT. I just wanted to point out some typos in the CMD.

So on page 77, you show satisfactory for SRBT as opposed to fully satisfactory for conventional health and safety in the table.

And in the footnote, "previous" is mis-spelt.

My question is for Nordion. On page 93 of the CMD, there's a statement that Nordion did not achieve its newly-established internal target for thyroid monitoring compliance in 2015.

Can you provide some more information on what it is that you weren't able to achieve, and what are the implications of that?

I'll ask Nordion to go first, and then staff after.

**DR. BEEKMANS:** Rick Beekmans, for the record. I'll start, and then I'll ask Richard DeCaire to fill in some of the blanks.

So we have -- each year, we establish goals and targets in and around safety, and so an example like that would be lost time incidents, near miss hazardous occurrences. And this is -- we have a target here around

some monitoring we do. So we're monitoring this on a monthly basis within the management team.

So last year was the first year we put this target in place with an aggressive goal, and as of this year we've been doing quite well against that target.

I'll let Richard -- I'll pass the baton to Richard now and ask him to explain to you a little bit about how that target works and what we're actually measuring.

**MR. DeCAIRE:** So Richard DeCaire, for the record.

There's two different ways we look at the numbers here, and this target was set up with the goal of improving safety culture and a way to measure safety culture. To -- I think in CNSC document RD-58 it talks about suggested frequencies for monitoring for iodine-131 and iodine-125 of monthly and quarterly.

So at Nordion, we have a long-established practice of monitoring more frequently than that. We monitor our employees on a weekly or biweekly basis, depending on the work they do, if they're involved with working with radio iodine.

So in a given month, we monitor between 66 and 70 people at Nordion over 2015. So that's a total of 821 person-months. And in our radiation protection manual,

our actual target is once per month. And we met that, in 2015, 819 times out of 821. It's only two people did not attend for the entire month, so the statistic we're looking at is, are they attending the more frequently-scheduled weekly or biweekly target.

So in terms of occupational health and safety of our employees, we don't -- it's not really an indication of that, it's more an indication of are they complying with safety requirements in terms of safety culture. That is what that target is really there to monitor.

**MEMBER VELSHI:** Thank you.

And what does it look like for 2016 to date?

**DR. BEEKMANS:** We hit 99 percent just this month. Do I have that right?

**MR. DeCAIRE:** No. Last year our monthly compliance, our real compliance number was 99.8 percent and our target is still 90 percent. We have done better this year for the 90 percent for attendance frequency, but last month we had some people miss.

**DR. BEEKMANS:** Right.

**MR. DeCAIRE:** Yes. But for the first nine months of the year we didn't have anyone who didn't attend at least once a month.

**MEMBER VELSHI:** Thank you.

Staff, did you want to add anything to that?

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

So just to complement Mr. DeCaire's answer, CNSC staff can confirm that Nordion is meeting their programmatic requirements to monitor monthly. Their performance in 2015 and our understanding in 2016 is 100 percent compliance with that program requirement.

What is introduced on page 93 of the CMD is their ALARA targets. So essentially what they are promoting is more frequent monitoring to identify in a timely manner intakes that could potentially occur and so that they can take action more frequently. Their target for 2015 was 90 percent compliance with that, either weekly or biweekly screening, and they achieved 86 percent. So we are satisfied that they are challenging themselves and they are striving for higher performance and we will monitor that into the future. Thank you.

**THE PRESIDENT:** I thought SRB wanted to say something.

**MR. LEVESQUE:** Yes. Thank you very much for the opportunity.

I just wanted to add that if you look at

Figure 8.4, that it's not represented here but there are actually 11 wells at the boundary of the site right at the front that are all several magnitudes lower in concentration and they are all drilled at different depths. There are also a number of wells that are across the -- there's three monitoring wells, there's two that SRB drilled, another five that existed, and three business wells that you do see represented here. So there are a number of wells, there are about 20 wells that are in between these wells and the ones that you see represented here, just to make that clear.

**THE PRESIDENT:** Thank you.

Dr. McEwan...?

**MEMBER MCEWAN:** Thank you.

So it goes back to my earlier question about SCAs and ratings. I note that Nordion in 2014-2015 satisfactory. Below it you say that a key performance measure is the number of LTIs. They had three in 2014, so I think it's understandable why it would change, but they have none in 2015. So what else has not changed that you would not consider changing that to a fully satisfactory, if that is your key performance indicator?

**MS TADROS:** Haidy Tadros for the record.

Perhaps I will start with a bit of a descriptor. So coming back to -- rightly, as you've

mentioned, Dr. McEwan, LTIs are definitely the indicator, but we also have, as mentioned, awareness with regards to what is going on within the facility, staff's awareness of conventional health and safety, the initiatives and the programs that are put in place to help maintain a better awareness of conventional health and safety. So it is not just because they have not had any LTIs in the last year that they automatically get boosted.

I do recognize and appreciate your comment that there needs to be a bit more transparency and a bit more fundamental structuring of how our expert judgment is put together to bring these ratings forward, but in this particular case it wasn't just the LTIs being less than what they were before. So I would ask Mr. Rob Dwyer to answer that question.

**MR. DWYER:** Good afternoon, Mr. Chairman and Commission Members. My name is Robert Dwyer. I am a Project Officer in the Nuclear Processing Facilities Division and an inspector.

So as you can see in Table 9-2 on page 99 in the CMD, the trend for Nordion's LTIs were fairly low, zero in 2011, zero in 2012, 2013 was one, and 2014 was basically a blip in the data. We did see an increase in the number of LTIs and upon investigation we noted that they did have a similar cause. Most were related to back

injuries. So we did look at that data and consider the performance rating. We did lower it to a satisfactory rating at that time.

So this year and future years we will continue to look at the number of LTIs and Nordion's performance in the area of conventional health and safety and as they continue to show excellent or good performance we will consider the rating at that time.

**MEMBER MCEWAN:** So help me understand how you measure or monitor or assess this concept of sort of safety awareness, because clearly that is one of the elements that you would feed into this. So what has changed in the organization around that between 2013 and 2015?

**MS TADROS:** Haidy Tadros for the record.

Again, I will perhaps draw on Mr. Rob Dwyer's experience with the facility with regards to safety awareness and being able to complement the need to address how the indicators have shown that the persistent LTIs that were shown to be predominantly from ergonomics, back injuries, and how Nordion is bringing their awareness to a better level.

**MR. DWYER:** It's Robert Dwyer again for the record.

So we are looking for improvement in the

implementation of the program and we can do that through a number of ways, through reviewing the LTI information, when we are doing our compliance inspections as well, it feeds into our assessment of their performance.

I think that's basically all I have to add.

**MEMBER MCEWAN:** You haven't answered my question. How do you assess awareness? I mean do you observe people bending and lifting rather than squatting and lifting? I mean you must have some measure that defines a level of dissatisfaction with that awareness or whatever you do. I mean you keep going back to LTIs. There are no LTIs.

**MR. AMALRAJ:** Julian Amalraj for the record, Senior Project Officer at the Nuclear Processing Facilities Division.

I will take a crack at this at the higher level in terms of how we would rate conventional health and safety, the programs and the expectations in terms of what the licensee would have to run.

As part of the conventional health and safety program, licensees are mandated to have joint health and safety committee meetings and from an awareness point of view there is an aspect of training. There are a variety of key lead indicators and lag indicators that the

licensee uses to assess how the program is implemented in terms of awareness of the personnel and workers and there is worker participation in the Joint Health and Safety Committee meetings where feedback is received.

Now, the minutes and the operations of this are regularly reviewed by CNSC staff and at pretty much every inspection when we are onsite we are looking for evidence in terms of lead indicators and lag indicators. So we get an assessment of how safety is practised in general in a facility and how it relates to the programmatic elements that are in place, whether they meet the *Labour Code of Canada Part II* requirements as well as staff expectations in terms of assessment metrics that the licensee uses to self-assess themselves in terms of program implementation.

Now, we don't necessarily rate the entire program's rating based on one or two incidents, as Ms Tadros had previously mentioned, but performance assessments are very critical in terms of how overall the program has performed. So we use all these indicators to ensure that an overall assessment is done as well as from an awareness point of view of what exactly the licensee would do.

**MEMBER MCEWAN:** That helps, thank you.

Nordion, any comments?

**DR. BEEKMANS:** Rick Beekmans for the record.

Yes. You know, a couple of years ago when we had those three incidents, you know, we were extremely disappointed with those results. I think one of the challenges is that when you are looking at LTIs, you know, that is a rear view measurement and it's not necessarily telling you what's going on with employee awareness.

So there are a number of things that we have been doing here and this year we are just in the midst of reviewing what the targets will be and what are the things we will be using to assess our safety culture next year.

But some of the things we have done is, you know, we have done safety culture surveys on a routine basis. We just looked at some results of a safety culture survey that was done in the past 12 months and we were very, very pleased with the results.

This year we have been paying very, very close attention to monitoring of near misses and improving the culture of reporting near misses and we were very proud of the results. In the past three years we have had a significant increase in near-miss reporting and I think the result of that is a very positive environment where people are talking about safety, talking with their managers about

safety and having a dialogue.

One of the things that we also did in the past 12 months is every quarter my team put together a very focused presentation with speaker notes. We sat down with managers and we equipped to managers to have very focused talks with their teams and to have a dialogue.

We also on a quarterly basis put out a safety document, it's called "News for You," and we encourage dialogue, participation. We give out monthly awards when people do crosswords, safety crosswords.

So I think there are a number of things and one of the things I would be interested in having a dialogue with the CNSC is, you know, maybe there are some other things that we should be putting in our annual report and providing to you so that you can include them in this report when you are assessing, you know, the conventional health and safety, because I think there are a lot of other things that could be looked at other than just LTIs.

**MEMBER MCEWAN:** Okay, thank you very much.

**THE PRESIDENT:** While I have Nordion online here, so if you look at -- maybe I will start with staff because this is a regulatory issue.

So if you look at the tables on pages 200 and 201, so here I am, you guys know how much I love units, so we are now into gigabecquerel per year and I see a

number like for Xenon-133 there's a number 29 million. So there is no explanation. What does it mean? Where does it come from? Is it a 1 mSv protective -- what is this?

And while I have you, the same table, the next table, so for example for cesium-137, the 64,000, is that again the guideline, the protective guideline? Is there a toxicity issue here? All of the above.

**MS SAUVÉ:** Kiza Sauvé for the record. I am the Director of the Environmental Compliance and Laboratory Services Division.

The licence limits in the Nordion licence that you are seeing are all based on the derived release limits and so those are based on a 1 mSv per year public dose and so it's derived for each parameter, that should they release, let's say for cesium, 64,100 gigabecquerels per year, there would be a public dose of 1 mSv, which is the reason why we have action levels, because we wouldn't expect it to be that high, but that's how the derived release limits, they follow CSA Standard N288.1, they follow a methodology using the most exposed individual in the public and those are how those licence limits are derived.

**THE PRESIDENT:** For example using the Xenon, you have 29 million where every actual reading is nowhere near that limit.

**MS SAUVÉ:** That's correct. That's how the derived release limits are derived based on the CSA standard.

**THE PRESIDENT:** So Nordion, back to you. So what is your action item that is useful to keep track that you don't go much beyond, I don't know, 35, maybe 40?

**MR. DeCAIRE:** Richard DeCaire for the record.

The actions levels that we agreed with the CNSC that we would establish are based not on the derived release limits or the annual releases, they are based on a release that would give an indication of a loss of control. So we have small average releases throughout the year and we looked statistically at between eight and 10 years of data and the statistical analysis, and from that you would base the actual levels on what looks like normal operating performance and what looks like something outside of normal operating performance, which would indicate a loss of control. That is what the action limits are based on. Because you can see from dividing the 34,000 by 29 million, the public does not get a lot of dose if you multiply that by 1 mSv, less than .01 mSv for a Xenon-133 exam.

**THE PRESIDENT:** So again, that's why we are becoming a little bit more insistent about seeing some of those action levels which are a little bit more

meaningful to the actuals. You want to see the action level is very close to the actuals.

**MS SAUVÉ:** We have heard you loud and clear. We will.

**THE PRESIDENT:** Okay.

Ms Velshi...?

**MEMBER VELSHI:** Okay. So I will move to Best Theratronics. Page 103 of the staff CMD on the staff inspection that identified non-compliance with the National Fire Code. So first, kudos to staff for doing so.

A couple of questions. One was: How long would this dust collector have been in service and is there a requirement for third party fire audits and does Best do them?

**MS TADROS:** Haidy Tadros for the record. I will ask Ms Anne McLay to answer the question.

**MS McLAY:** Hi, Mr. President, Members of the Commission. My name is Anne McLay. I am a Senior Project Officer with the Nuclear Processing Facilities Division, for the record.

The dust collector had been in operation for 50 years. It was pretty old. Best had submitted a fire hazard analysis and CNSC staff reviewed it. We noticed there was a non-compliance with the National Fire Code. We went for an inspection. We determined it was out

of compliance with the Fire Code. We noticed other things. There was a significant amount of dust in the dust collector filter. There were electrical issues. There were issues with housekeeping and combustible materials nearby. So we issued an order to shut it down until they could ensure it was in compliance with the Fire Code.

There is no requirement for an audit, but they did do an audit of the carpentry shop and they have done an independent audit of the National Fire Code. So they have taken steps to ensure the safety of their people at site.

**MEMBER VELSHI:** So do most workplaces require audits, you know, for compliance to the Fire Code by qualified people? I'm sure you were surprised that this had been in the state that it had been for this long and I'm just wondering -- I mean it's fine, they have fixed the problem now, but how do we address the root cause of this?

**MR. BOUNAGUI:** Zaq Bounagui for the record. I'm a Fire Technical Specialist with CNSC.

Yes, we do have like a requirement for annual third-party review audit for the facility. So every year they have to conduct -- hire a third-party review to conduct a site condition inspection and that report is sent to the CNSC.

For this case they did also a fire hazard

assessment and identified that issue. Then we looked at the review for the fire hazard assessment and then we took a proactive action to go there and do the inspection. Then we found the state of the dust, of the shop, carpentry shop does not meet the requirements and then we urgently put in an order to cease the operation. And then the licensee hired a consultant to look at and provide recommendations for the licensee.

And all of those recommendations have been implemented and one of them is the replacement of the dust collector. So now they have like a new dust collector system equipped with a system to prevent any explosion. So now the shop meets the regulatory requirements.

**MEMBER VELSHI:** I want to make sure I understood you correctly. So it was the report from the third party that they sent to the CNSC that raised flags for you that they weren't in compliance. So what had Best done when they received that report and said, but we need to do something as opposed to wait for the CNSC to come and tell us we need to do something?

**MR. BOUNAGUI:** When they submitted the fire hazard assessment, CNSC as usual looked at the report and then we didn't see like a clear action plan. Therefore we were proactive to go there for an inspection and then confirmed that there is a risk within that shop and then we

issued an order and then they fixed the issues.

**MEMBER VELSHI:** Right. So I understand the work CNSC did. My question was the licensee -- is there an expectation that when the licensee got that report that they would have done something with it?

**MR. JAMMAL:** It's Ramzi Jammal for the record.

Your question is very valid, but I'm going to give you the compliance history of this licensee.

It was not a very bright history with this licensee. So when our colleagues talk about our fire specialist reviewed the third-party report, we usually allow the licensee to implement. But in the case of Best -- and we always spoke about the performance of compliance activity of the licensee -- the compliance history of Best is not the best of our licensees.

So when our staff found out in the fire hazard assessment, in this case we wanted to make sure that we -- let me put it this way, obligate the licensee to take the action. Based on the risk assessed by our staff, there was no time to waste, let me put it this way, so it has to take immediate action. So we put them on a close monitoring review in order to ensure that the implementation is done to its fullest.

So that was the action/reaction. So it's

based on risk assessment, immediate action, and was the licensee able to, with respect to compliance history, we will take that action. Staff made a decision, issue an order, we can track it from that perspective.

**MEMBER VELSHI:** Thank you.

Best, do you have any comments on that?

**MS MASON:** It's Samantha Mason for the record.

Yes, we do know that our compliance on the Fire Code based on that section was not the strongest. The report that that item was found from actually had more -- other issues in it that we had been addressing. We didn't identify the carpentry area as a high priority because it was not frequently used. When the CNSC came in, we did address it immediately. We had prioritized it differently and unfortunately it was not the correct assessment.

**MEMBER VELSHI:** Thank you.

**THE PRESIDENT:** While I have you on the phone for Best, could you just give us a little update as to how you're doing with the disposal of your sealed sources?

**MS MASON:** We are proceeding pretty much as quickly as we can between our disposal site and Nordion, who is doing the work for us as they are stored there. It is a large amount of sources that we are working on

disposing.

We are actually disposing of sources beyond the requirements of the order. As the Commission is likely aware, we have a large inventory of disused sources that we are proceeding to dispose of. They are proceeding rather smoothly now and we are hoping in the future that -- not after this financial guarantee that's up for renewal but perhaps at the next licence renewal we might be able to lower our guarantee because we won't have the inventory that we currently have, but that is down the line. We know this is going to take some time to dispose of items.

**THE PRESIDENT:** Staff, any comments on this?

**MS TADROS:** Haidy Tadros for the record.

So yes, that is accurate. I think from staff's perspective, we can confirm that Best has disposed or sold off approximately 64 out of the 114 sealed sources that they currently have and, as noted in our presentation, we are currently looking at the preliminary decommissioning plan that Best has updated given that their inventory has gone down.

**THE PRESIDENT:** Thank you.

Dr. McEwan...? Ms Velshi...?

I want to go back to -- so SRBT, in the CMD on page 82 -- maybe I can ask SRBT why you're not using

extremity doses. Remind me again. You are using tritium and when you handle tritium, you don't need monitoring the dose to fingers, let's say?

**MR. LEVESQUE:** Stéphane Levesque for the record.

No. The effective way to measure tritium like we process at our facilities is through urinalysis. So we perform weekly urinalysis for the staff that works in the area with the tritium, with other staff being monitored every two weeks, including the shop floor staff.

**THE PRESIDENT:** So is that kind of a normal practice or you don't need an extremity special measure? I find it a bit surprising because I thought we were creating these little devices that I thought you may want to do that. So let me learn here.

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

So this question came up last year and we thought we had addressed it in the CMD by adding the additional text, but again, for the record, doses that are as a result of the exposure to tritium are ascertained through the urinalysis method. It's a very weak penetrating beta emitter that when taken into the body is excreted in the urine and the use of extremity dosimeters is really not an appropriate method for ascertaining doses.

Furthermore, the skin doses essentially mimic the effective doses, so they are one and the same and there is no need for any additional monitoring.

**THE PRESIDENT:** Thank you.

I think my last question here is again about limit. I notice that SRBT liquid effluent is again 200 gigabecquerels per year as a load. So is that to calculate -- again, is it the 1 mSv or is it to get down to -- if you do that, you will get to below 7000 becquerels per litre? Why is it in that and not in becquerels per litre as the protective? I'm mixing load and --

**MS SAUVÉ:** Kiza Sauvé for the record. You are mixing.

**THE PRESIDENT:** Right.

**MS SAUVÉ:** So the release limit is based on the public dose of 1 mSv. That doesn't mean that there isn't environmental monitoring that's done around the facility and those results would be compared to drinking water limits for surface water.

**THE PRESIDENT:** So that's the limit for this particular facility?

**MS SAUVÉ:** Kiza Sauvé for the record. I'm going to have my colleague correct me.

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

Given the high results around the stack,

all the limits were based on the protection of groundwater. So if they were to emit that certain -- whatever amount that's in the licence, it would be protective of the groundwater, so it has nothing to do with public dose. By protecting the groundwater, it's way below what you would be able to release for a dose for a member of the public.

**THE PRESIDENT:** Okay, so I'll bite. So how did you come up with 200? The limit is 200 gigabecquerels per year. Go ahead, guys.

**MR. LEVESQUE:** Stéphane Levesque for the record. The 200 GBq, I will let Jamie MacDonald explain where it comes from, but in addition to the loading, which is the 200 GBq, we also do measurements onsite that any concentration that we release in our liquid effluent is below the drinking water level. So if a worker at the sewage treatment plant or anywhere down the line was to consume sewage that their dose would also be below. But the 200, I will let Jamie explain it.

**MR. MacDONALD:** Jamie MacDonald for the record.

The 200 GBq limit that was first established with SRBT's licence limit was back in the early 2000's. It was a 1/5 of value that was in IAEA-TECDOC I believe it's 1000 as far as radioisotope releases to public sewers from radioisotope processing facilities like that.

So in consultation with CNSC staff when we were coming up with an appropriate limit for releases to sewer for liquid effluent, that's where the 200 GBq originally came from and it has remained that to this day.

**THE PRESIDENT:** So it is an IAEA-based standard, is it?

**MR. MacDONALD:** Jamie MacDonald for the record.

To my recollection, when the 200 GBq per year limit was put in place, that was where that was sourced from. Twenty percent of a limit that was described in an IAEA technical document.

**THE PRESIDENT:** Again, you know, this reinforces the need for us to explain where those limits come from and how did you arrive at them. Thank you.

Any other question on this?

Okay, thank you.

Any additional comments that SRBT or Nordion or Best want to make? Now is the time.

**MR. LEVESQUE:** Stéphane Levesque for the record.

Thank you for allowing us to answer the questions, but no, thank you.

**THE PRESIDENT:** Thank you.

Nordion...?

**DR. BEEKMANS:** Rick Beekmans for the record.

No, no comment, and thank you very much and have a good evening.

**THE PRESIDENT:** You too.

Best...?

**MS MASON:** Samantha Mason for the record.

Thank you very much for allowing us the chance to answer your questions.

I would just like to note that we would like to also thank Nordion for their assistance with our disposals. I don't think that has been clear in this report, but they have been helping us immensely and we do appreciate it.

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

**CMD 16-43 / 16-M43.A**

**Regulatory Oversight Report for Nuclear Processing,  
Small Research Reactors and Class IB  
Accelerator Facilities: 2015**

**THE PRESIDENT:** We will now proceed with part three of the presentation on section 3 of the Report on small nuclear research reactor facilities.

Note that Commission Member McEwan has excused himself from this section because of his professional link with the University of Alberta.

Staff, please proceed.

**MS TADROS:** Thank you, Mr. President and Madam Velshi.

**THE PRESIDENT:** Sorry. Sorry to interrupt. I have to do the roll call. I understand that we have some licensees online.

**MR. LEBLANC:** Yes. So if you allow me, I think we have Dr. Chan from the Royal Military College with us. Thank you for being here.

And on the line I'm going to verify if Saskatchewan Research Council, is Mr. Muldoon still with us? Dr. Muldoon?

**DR. MULDOON:** Yes, I'm here.

**MR. LEBLANC:** Thank you.

And do we still have Mr. Heysel from McMaster University?

**MR. HEYSEL:** Present.

**MR. LEBLANC:** Thank you.

Mr. Duke from the University of Alberta?

**DR. DUKE:** It's Dr. Duke, but yes.

**MR. LEBLANC:** Thank you.

Ms Chilian from École Polytechnique de

Montréal, est-ce que vous êtes avec nous?

**MME CHILIAN :** Oui, je suis avec vous.

**M. LEBLANC :** Merci. Bienvenue.

And from TRIUMF, I think Dr. Bagger was no longer available, but perhaps Dr. Trudel or Dr. Mildenberger is with us?

**DR. TRUDEL:** Dr. Trudel is here and Dr. Mildenberger as well.

**MR. LEBLANC:** Thank you very much.

And I'm not certain if Mr. Grant Cubbon from the Canadian Light Source was able to stay with us. Do we have a representative from CLS? It would not seem so.

So thank you very much and we will be proceeding with the staff's presentation and then we will be asking if any of you have some statements to make before proceeding to the question period. Thank you.

**UNIDENTIFIED SPEAKER:** (Off microphone)  
from the Saskatchewan Research Council.

**MR. LEBLANC:** Did we miss somebody?

**UNIDENTIFIED SPEAKER:** Yes, we have Dave Chorney, Jeff Zimmer and Jenna Smith-Windsor from the Saskatchewan Research Council SLOWPOKE-2 Facility.

**MR. LEBLANC:** Thank you very much.

**THE PRESIDENT:** Go ahead please.

**MS TADROS:** Thank you, Mr. President.

For the record, my name is Haidy Tadros, and for this next section that relates to the performance of small nuclear research reactors, I will ask my colleague Mr. Jean LeClair to make the presentation.

**MR. LECLAIR:** I guess I should say whether it's good afternoon or good evening. I guess we are getting close to good evening.

Mr. President and Members of the Commission, my name is Jean LeClair. I am the Director of the Nuclear Laboratories and Research Reactors Division.

My presentation will be focused on the performance of small nuclear research reactor facilities.

The small nuclear research reactors have been in the landscape within the academic communities for decades to conduct research and in some cases to support industrial activities and produce medical isotopes.

There are six small nuclear research reactor facilities in Canada.

The largest one is located in Hamilton, Ontario. It is the McMaster nuclear reactor located at McMaster University.

In addition, there are four SLOWPOKE-2 reactors located in various universities/colleges across the country.

There is also a subcritical assembly located at École Polytechnique de Montréal. As of June 30, 2016 the subcritical assembly licence was revoked and École Polytechnique's SLOWPOKE-2 licence PERFP-9A.00 with an expiry date of 2023 was amended to include the subcritical assembly.

The small nuclear research reactor facilities are low-power reactors with thermal capacities ranging from 20 kW or 0.02 MW for the SLOWPOKE-2 reactors to 5 MW for McMaster nuclear reactor. École Polytechnique's subcritical assembly has a near zero energy output and is used for academic purposes, operating about once every five years. These low-power reactors are designed with inherent safety characteristics, protecting the health and safety of persons and the environment.

The CNSC continuously monitors these facilities to confirm their continuing compliance and safety performance. This table presents the licensing and compliance effort from CNSC staff for small nuclear research reactor facilities during 2015. CNSC staff's primary efforts in 2015 were in compliance activities which include inspections of these facilities, their activities and processes and review of licensee reports.

CNSC staff performed a total of seven compliance inspections at the small nuclear research

reactor facilities in 2015. All the findings resulting from these inspections were documented in detailed inspection reports that were provided to licensees. There were no major non-compliances.

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 2015, all the small nuclear research reactor facilities met CNSC requirements and received a satisfactory rating, with the exception of McMaster nuclear reactor which received a fully satisfactory rating for the security safety control area. The fully satisfactory rating is due to MNR's maintaining a strong security culture and a best in class program to control access to facilities, nuclear material and prescribed classified information. Overall, these ratings indicate adequate management of safety and control measures at all facilities.

The graph on this slide shows the 2015 average and maximum effective radiation doses to workers at the small research reactor facilities. The red line is the regulatory annual effective dose limit of 50 mSv for a nuclear energy worker.

As shown, the average in maximum doses

received by a worker at each of the facilities were well below the regulatory limit. This data demonstrates the doses to workers at these facilities are safe and the radiation protection programs are effective. Perhaps it's also a reflection of the generally low risk associated with these facilities.

This slide shows the number of lost time injuries for the last five years. I believe the table speaks for itself, indicating that over the last five years there were no lost time injuries at any of the facilities.

The following slide provides the Commission with an update to the status of the public information programs of the small research reactor facilities.

In 2015, all licensees actively provided information on the operations of their research reactors on their websites, some including informative videos. Examples of other communications activities undertaken include open houses, facility tours and participation in community events.

The small nuclear research reactor facility licensees have been implementing their public information and disclosure programs satisfactorily during 2015 and their programs are effective at communicating information about the health and safety and security of

persons and the environment and other issues of interest about their facilities.

I will now proceed with a bit more detailed information for each of the licensees, beginning with the McMaster nuclear reactor.

The McMaster nuclear reactor, or MNR, has been in operation since 1959 and is used for research, materials testing, teaching and isotope production. In addition to supporting research work of McMaster University students at the bachelor's, master's and doctorate levels in physics and engineering, MNR is also used for the irradiation of over 10,000 mineral and other samples per year for various applications such as biomedical research, material science and geological surveys. The reactor is also used to produce iodine-125 for medical use in Canada, the United States and other countries. MNR is also used for neutron radiography which is performed on a daily basis for testing of aircraft engine components.

The McMaster nuclear reactor's licence is valid from July 1st, 2014 to June 30th, 2024, and there have been no changes to the operations of the facility since the licence was granted in 2014.

McMaster University is currently in the construction phase of the McMaster intense positron beam facility. The project was awarded funding by the Canadian

Foundation for Innovation and the Ontario Research Foundation and will be one of only four such facilities in the world and only one in Canada.

McMaster University was also awarded funding to design and construct a small angle neutron scattering facility which will allow numerous Canadian and international scientists access to this important research facility.

Construction of these facilities is authorized under the provisions of the current licence and are expected to be installed between 2016 and 2017.

In 2015, MNR had no regulatory limit or action level exceedances. They also had no lost time injuries. CNSC staff are satisfied that MNR continues to protect the health and safety of workers, the public and the environment.

Moving on now to the SLOWPOKE-2 facilities.

The SLOWPOKE-2 reactors are sealed-container in-pool designs with a nominal power of 20 kW thermal. The reactor is housed in a closed container suspended in a pool of water. This restricts access to the core and provides shielding against radiation.

SLOWPOKE-2 reactors provide a source of neutrons to carry out neutron activation analysis,

delayed-neutron counting, radioisotope production as well as radiography and radioscopy and support education and research at master's and doctoral levels in physics and engineering.

There were no changes to any of the SLOWPOKE-2 facilities that would affect systems, structures and components in meeting and maintaining their design requirements in 2015. There were no changes to the operations of the facilities either. However, the University of Alberta has indicated their plan to decommission its SLOWPOKE-2 facility.

The next slide is related to École Polytechnique and will be presented in French, so I will give people a chance if you want to put on your headsets.

Le 2 juillet 2015, l'École Polytechnique de Montréal a présenté une demande à la Commission que celle-ci révoque son permis d'exploitation numéro PERFP-9.00 et intègre l'assemblage nucléaire non-divergent au permis d'exploitation du réacteur SLOWPOKE-2 numéro PERFP-9A.00. La demande a été accordée et le permis consolidé a été émis en juin 2016.

L'École Polytechnique de Montréal a aussi révisé et soumis un plan de déclassement préliminaire et une garantie financière. Le personnel de la CCSN a examiné et accepté le plan de déclassement préliminaire et procède

à l'examen de la garantie financière.

Je vais maintenant continuer en anglais.

In 2015, the SLOWPOKE-2 facilities had no regulatory limit or action level exceedances. There were no lost time injuries at the SLOWPOKE-2 facilities in 2015. CNSC staff are satisfied that SLOWPOKE-2 facilities continue to protect the health and safety of workers, the public and the environment.

This concludes this section on small nuclear research reactor facilities. We are now available to answer any questions.

**THE PRESIDENT:** Okay. So we are doing -- okay, we will do the other one later on.

**MR. LEBLANC:** Yes.

**THE PRESIDENT:** Okay, I've got it. I'm slow here.

I'd like now to ask whether any of the facilities for section 3 licensees would like to make a statement now.

Marc, why don't you do a roll call?

**MR. LEBLANC:** Yes, I'll do this.

So this roll call will exclude the TRIUMF and Canadian Light Source, as they are scheduled to be dealt with in the section.

I'll try to follow the order that Mr.

LeClair has used, so we'll start with McMaster University.

Do you have any statements you'd like to make.

**MR. HEYSEL:** Chris Heysel, for the record.

McMaster's here, and standing by for questions. No introductory comment.

**MR. LEBLANC:** Thank you.

So will now ask Dr. Chan, who's with us here in the room, from the Royal Military College of Canada, whether he wishes to make a statement.

**DR. CHAN:** Good evening, President, and Commission members.

For the record, Paul Chan, professor, and the manager of SLOWPOKE-2 facility at the Royal Military College of Canada.

I agree with the presentations and I have no additional comments. I may just want to make a remark that RMC, the Royal Military College of Canada, is in the process of seeking funding for refuelling of the SLOWPOKE-2 Reactors. I just want to make that point.

**MR. LEBLANC:** Thank you.

I will now ask if the Saskatchewan

Research Council has any statement they'd like to make.

Dr. Muldoon?

**DR. MULDOON:** Dr. Joe Muldoon, for the record.

No, we have no additional comments to make, but are available for questions.

Thank you.

**MR. LEBLANC:** Thank you.

I will now ask -- je veux demander à Mme Cornelia Chilian avec l'École Polytechnique de Montréal si l'École Polytechnique a des commentaires ou une déclaration pour le registre.

**MME CHILIAN :** Cornelia Chilian pour le record. Donc, il n'y a pas de commentaire ou de déclaration de la part de Polytechnique, et on est ouvert pour les questions.

**M. LEBLANC:** Merci beaucoup.

And I will now ask Mr. Duke, from the University of Alberta, if the University of Alberta wishes to make a statement?

**DR. DUKE:** Dr. John Duke, from the University of Alberta, for the record.

Together with me is Dr. Katherine Moore, from the Vice-President Research Office. We

have no comment, but are certainly available for any questions.

**THE PRESIDENT:** Thank you.

So let's start the question period.

Ms Velshi?

**MEMBER VELSHI:** I'll go in that same order then.

So for McMaster, maybe I'll ask staff, that with these additional facilities that are being constructed, once they're ready and commissioned, would there be a need to change their current operating licence to allow them to run these facilities?

**MR. LECLAIR:** Jean LeClair.

No. As I mentioned, as part of the presentation, these would already be captured within the existing licence. If any changes would be necessary, they'd be associated with the *Licence Conditions Handbook*, which is usually done by staff.

**MEMBER VELSHI:** Thank you.

**THE PRESIDENT:** You can do this in sequence.

**MEMBER VELSHI:** Well, I've got a free rein here.

Okay, then, for the Royal Military

College -- and you said you're seeking funding for refuelling -- when are you expecting to have a decision on that? At what point do you say, "Oops, there's no money, we need to throw in a contingency plan?"

**DR. CHAN:** For the record, Paul Chan, the Royal Military College of Canada.

We are focusing our efforts on putting all the actions together and submit our business plan to the Department of National Defence to request for funding for the refuel of the reactors.

The target day of refuelling is supposed -- it will be a turnkey operation. Our target completion date to have the reactor running again is by the end of December 2018. It's likely that date will get delayed, so we are monitoring the use of the reactor to ensure we can extend the life of the reactor. For example, we are running at mostly 50 per cent power right now instead of 100 per cent power.

**MEMBER VELSHI:** How long do you think you could be able to extend it to?

**DR. CHAN:** Based on the calculation assessment, we shall be able to run the reactor at half power roughly around 2020. To confirm, we are

tracking the reactivity and the controller positions on a weekly basis. We will know for sure when we know, but we are right now -- even though decommissioning in on the -- but we are not focusing on decommissioning. Our activities and all our efforts are focusing on refuelling the reactor to support the Canadian Forces.

**MEMBER VELSHI:** Thank you.

Staff, maybe you can help answer this. Do the folks who operate SLOWPOKE Reactors in particular, do they have a joint forum where they get together and share learnings and, I don't know, develop joint training plans or public information programs?

**MR. LECLAIR:** I'm sorry. I was distracted. I just want to clarify one thing. I'm not sure if you mentioned SRC in the introductions. --- Off microphone / Sans microphone

**MEMBER VELSHI:** Yes, and they're...

**MR. LECLAIR:** So we've got an email just letting us know that they're online in case there are questions --

**MEMBER VELSHI:** Yes. Dr. Muldoon?

**MR. LECLAIR:** -- and especially with their plans with regards to the HEU.

If I could ask Ms. Velshi if you could perhaps just repeat your question so that I can --

**MEMBER VELSHI:** My question was: is there a joint forum for the SLOWPOKE licensees to come together, share learnings, best practices, develop joint programs? Some of them seem to, you know, have just a small complement of staff.

**MR. LECLAIR:** I'm not aware that there is one. Perhaps I can direct the question. We do have staff in Ottawa. I have project officers in Ottawa, at least I believe they're still there.

**THE PRESIDENT:** Why don't we ask --

**MEMBER VELSHI:** We'll ask the licensees.

**THE PRESIDENT:** -- the licensees --

**MEMBER VELSHI:** Yeah.

**MR. LECLAIR:** Sure.

**THE PRESIDENT:** -- because I remember that at the licence renewal -- they were all in front of us in Ottawa, and I thought they told us that they are planning or are meeting collectively to discuss mutual interests and concerns. Is that happening?

**DR. CHAN:** For the record, Paul Chan, from the Royal Military College of Canada.

We have not established an official

group, so-called working group, for the SLOWPOKE. We do communicate as practical as possible, such as during the small reactor conferences or the CNS annual conferences or through email when there is any opportunity that we could exchange OPEX.

So we're definitely are not working in isolation by all means, but we don't -- it's a great suggestion, and maybe we should consider that, but right now, to answer your question, we do not have a working group that meet on a regular basis.

**MEMBER VELSHI:** Does any other licensee want to comment on that?

**MR. ZIMMER:** It's Jeff Zimmer, from the Saskatchewan Research Council, for the record.

I would like to comment on that. We did have a SLOWPOKE Users Group, which meets infrequently, and, as Paul Chan indicated, generally in concert with, you know, conferences like CNS and stuff like that, but infrequently, and no sort of formal schedule for meeting.

But my understanding was that group, though we maybe haven't met in a while, is still active.

**MEMBER VELSHI:** Okay.

**THE PRESIDENT:** Okay. Well I...sorry?

**MR. ERDEBIL:** I'm sorry, for the record, Ismail Erdebil.

I agree with the comments made. There is exchange of information among the SLOWPOKE facility licensees. They share their experiences by email. For example, lately there was a reactivity concern, and this was shared. RMC came up with a solution, and shared the solution with other SLOWPOKE reactors.

**THE PRESIDENT:** Yeah, I remember that. This was a while back, but they were talking about even changing and exchanging parts, which brings me -- this is an old community, so I'm going to ask -- I'm going to go down the list. What I would like to know is what is the current -- and is there a current existing plan for decommissioning? I'm not talking about in the future. Do you have a year where these machines are planned to shutdown?

So let me start with McMaster.

**MR. HEYSEL:** This is Chris Heysel, for the record.

The machines that you're talking about -- and, you know, I can only really talk about MNR -- they're fairly simple machines, and easy to access all areas of the machine. As long as we can maintain funding and interest from the university,

i.e. supporting research and educational missions, then there's no date for final shutdown, for our facility anyway. As long as we continue to meet the needs of Canadian students and researchers, then our value is inherent for our facility.

**THE PRESIDENT:** What I meant to say is that for you it's operation as usual. For example, I understand that Alberta is now formally thinking about decommissioning.

Is that correct, Alberta?

**DR. DUKE:** John Duke, for the record, University of Alberta.

Yes, we expect by the end of next week to actually have submitted our application for a licence to decommission to the CNSC, with the planned decommissioning occurring late summer/early fall of 2017, depending on the licensing process.

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

Saskatchewan?

**DR. MULDOON:** Joe Muldoon, for the record.

The Saskatchewan Research Council, we're continuing to operate, but will be undertaking discussions as to whether or not we will consider decommissioning over the next 12 to 18 months. We

will be having those discussions and making some decisions.

**THE PRESIDENT:** Because you're still operating with HEU, so I'm just wondering whether that's a factor here. Or if you decide to continue, will you decide to go to LEU. Are all those factors being considered now?

**DR. MULDOON:** Yes. Joe Muldoon, for the record.

The HEU is the factor that's actually pushed this discussion to the forefront. Based on our current operating design, we have a number of years left in operating the SLOWPOKE, so with the decision, wanting ensure that we get the HEU either sent down to the States or finding some other home for that and/or or whether we decommission, and then either shut the equipment down completely or whether we refuel with low-enriched uranium.

That is all part of the discussion and we've not reached any conclusions to date.

**THE PRESIDENT:** I think this is going to be a hot topic for us if we will ask updates on an annual basis.

RMC?

**DR. CHAN:** For the record, Paul Chan,

from RMC.

As for the licence, we all have a decommissioning plan. At RMC we plan to refuel the reactor and run the reactor for another 30 years, and that is the plan.

**THE PRESIDENT:** Thank you.

École Polytechnique, est-ce qu'il y a un plan réel pour déclassement?

**MS CHILIAN:** Yes, we do, we have a plan. It's Cornelia Chilian, from Polytechnique, for the record.

We have a decommissioning plan, but we are applying to the Commission in 2032. In fact, based on the actual reactor utilization, probably we can go until 2036. As you know, we are operating with low-enriched uranium, and since we are a facility that is 40 years old, in 2011 we get spare parts from Dalhousie, and now we are exchanging with Edmonton, the University of Alberta. Eventually, if they are decommissioning, we are planning to get parts from their reactor in order to continue to operate.

**LE PRÉSIDENT :** Alors, merci beaucoup, c'était utile.

Ms Velshi.

**MEMBER VELSHI:** Following up on that

last discussion, you said you've just reviewed the latest preliminary decommissioning plan and financial guarantee from the Polytechnique, so has it changed, has the quantum changed from the last time you reviewed it, and has it changed significantly?

**MS CHILIAN:** Actually, the personnel of CNSC have done several iterations with us, and we have an action plan related to the decommissioning plan, to the preliminary decommissioning plan, and also to update the financial guarantee.

**MS TADROS:** Haidy Tadros, for the record.

I'd like to ask our colleague in Ottawa, Karine Glenn, who has reviewed the preliminary decommissioning plans, to provide further detail.

**MS GLENN:** Karine Glenn, for the record.

I'm the director of the Waste and Decommissioning Division at the CNSC.

We have, indeed, been reviewing the decommissioning plan that was revised as submitted by École Polytechnique. They have put forward a plan to do the decommissioning themselves, which entails setting up a specific training program to ensure that they continuously have staff to be able to complete

the decommissioning, and then that they've adjusted the financial guarantee required for the decommissioning according to that plan.

**MEMBER VELSHI:** And so the big change is because of them now wanting to do it themselves, as opposed to contracting it out. We've just heard of some other who are thinking of expediting their decommissioning. Again, this may be useful information to share with each other.

**THE PRESIDENT:** Any other questions?

On page 121 -- this is McMaster Nuclear Reactor -- there was the one event from 2015. I don't know if you already spoke to it and I missed it, but there were three shim rods that were found interoperable. All I want to know is, is it a unique event? Three at the same time always worries me. One at a time I can get it, but three? Is there something I'm to concern?

So why don't I start with McMaster.

**MR. HEYSEL:** Chris Heysel, for the record, from McMaster.

Yes, this was an unusual event. It was caused by a power surge within a subcircuit, and caused the indications of the guide tubes to fail. There was never ever an actual problem with the

operation of the control and safety system. Since that time, that has been addressed with a design for fusing of the circuit.

**THE PRESIDENT:** So you know the root cause and you're not concerned with that?

**MR. HEYSEL:** Correct. We did a full root cause analysis on the event, determined corrective actions, and implemented them.

**THE PRESIDENT:** Thank you.

I think that's it.

Anybody want to make final comments?

Go ahead.

**DR. CHAN:** For the record, Paul Chan, from RMC.

I just want to thank the staff from CNSC, and particularly the transparency and the flexibility of allowing the use of a graded approach on the licence for SLOWPOKE, which is extremely, extremely helpful in terms of dealing with the real issue and the limited number of staff that we have at the SLOWPOKE facility and to ensure that we're safe to operate and still be able to support the education and the training of the Canadian Forces. I just want to thank the staff and the members of the Commission.

Thank you.

**THE PRESIDENT:** Thank you.

Anybody else? Going once, going twice, done. Have a good evening.

**MS CHILAN:** Thank you. You, too.

**THE PRESIDENT:** We will now proceed with part 4 of the presentation on section 4. Let me try that again, we'll now proceed with part 4 of the presentation, section 4 of the report regarding Class IB, particle accelerator.

Staff, please proceed.

**MS TADROS:** Thank you, Mr. President, members of the Commission.

For this last part of our annual report, I would like to ask Mr. Mark Broeders to make this presentation.

**MR. BROEDERS:** Good afternoon, Mr. President, and members of the Commission.

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

I will be presenting the next part of this presentation on the performance of the Class IB particle accelerator facilities.

There are current two Class IB particle accelerator facilities in Canada. TRIUMF

Accelerators, Incorporated is located on the University of British Columbia campus, in Vancouver, and is Canada's national laboratory for nuclear and particle physics research and related sciences.

Canadian Light Source, Incorporated is located on the University of Saskatchewan campus, in Saskatoon, and operates a synchrotron facility. The facility produces synchrotron radiation that is used as a light source for experiments in diverse scientific fields.

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 Class IB particle accelerator facilities during 2015.

CNSC staff spent a total of 20 person-days on licensing activities. A total of 303 person-days were dedicated to compliance activities, which include inspection of these facilities, licence activities and processes, as well as desktop reviews of licensee reports.

CNSC staff performed a total of four compliance inspections at the Class IB particle accelerator facilities in 2015. All the findings

resulting from these inspections were provided to the licensee in detailed inspection reports.

The performance ratings for each of the 14 SCAs were determined by CNSC staff based on the results and observations from inspections and desktop reviews. For 2015, the Class IB particle accelerator facilities met or exceeded CNSC requirements and received a Satisfactory or Fully Satisfactory rating according, with the exception of one Below Expectations ratings for failing to meet CNSC expectations.

The basis for the Below Expectations rating will be discussed later in the presentation.

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 2015 for TRIUMF and CLS. The red line represents the regulatory annual effective dose limit of 50 millisieverts for a nuclear energy worker. As shown, the average and maximum dose received by a worker at each of these facilities was well below the regulatory limit.

This data demonstrates that dose to

workers at Class 1B accelerator facilities are safe and their radiation programs are effective.

This slide shows the number of lost time injuries for the last five years. The injuries which occurred were not specifically related to the licence activity but rather were occurrences that may happen in any ordinary laboratory or administrative office environment. CNSC staff conclude that the Class 1B particle accelerator facility licensee's program related to the conventional health and safety SCA were effective in protecting the health and safety of persons working in those facilities.

In the next few slides I'll provide some specific highlights for the Class 1B particle accelerator facilities for 2015, starting with TRIUMF Accelerators Incorporated.

There were two reportable events in 2015 at TRIUMF. One was for a non-nuclear energy worker having incurred dose in excess of the TRIUMF quarterly action level while carrying out work during shutdown. The other event was an accidental release from a rubidium target. TRIUMF investigated both events to determine root causes and implemented corrective action. CNSC staff have reviewed and accepted the corrective actions that TRIUMF has implemented.

In 2015, TRIUMF had no regulatory limit

exceedances. TRIUMF had four lost time injuries in 2015, totalling nine days of lost time. CNSC staff find that actions taken by TRIUMF to be acceptable and are satisfied that TRIUMF continues to protect the health and safety of workers and the environment.

This concludes the section on TRIUMF. I will now move on to Canadian Light Source Incorporated.

CLS received a below expectations rating for the human performance SCA in 2015, as mentioned earlier. This is based on an inspection conducted in May of 2015 that found there had been no progress on the systematic approach to training-based training system. The inspection noted that the required analysis had not been performed and further that the CLS training system was not adequately reflected in an overarching training system manual with supporting procedures.

In April 2016, CLS submitted a status update to the CNSC including updated programs that addressed the non-compliances. CNSC staff reviewed and accepted the updated programs which demonstrate significant progress in addressing this issue. CNSC staff will verify the implementation of the SAT through an on-site inspection scheduled for the next quarter and will inform the Commission on the results in the 2016 regulatory oversight report.

In 2015, CLS had no regulatory limit or action level exceedances. CLS had one lost time injury leading to two and a half days of lost time. CNSC staff have reviewed the event and are satisfied that CLS continues to protect the health and safety of workers and the environment.

This concludes the section on Canadian Light Source. I'll now turn the presentation back to Ms Haidy Tadros.

**MS TADROS:** So for our final slide and in conclusion, Haidy Tadros for the record.

CNSC staff compliance activities across uranium processing facilities, nuclear substance processing facilities, small research reactors, and Class 1B particle accelerators during 2015 have confirmed that radiation protection programs adequately controlled radiation exposures, keeping doses as low as reasonably achievable; environmental protection programs are effective in protecting the environment; and overall, conventional health and safety programs continue to address the needs of workers and protect them.

CNSC staff conclude that in 2015 each facility made adequate provisions for the protection of the environment, the health and safety of persons, and the implementation of Canada's international obligations.

Thank you for your attention. We're available to take questions.

**THE PRESIDENT:** You just did your conclusion just before we finish yet with -- so that's okay. We understand.

So I'd like to ask whether the licensee TRIUMF or Canadian Light Source would like to make any statement right now. TRIUMF?

**DR. TRUDEL:** This is Dr. Trudel for the record.

No, we have no statements, but we remain on standby to answer any questions.

**THE PRESIDENT:** Canadian Light Source?

**MR. LEBLANC:** They're not online.

**THE PRESIDENT:** Not online?

Okay, so question period. Who wants to start? Ms Velshi.

**MEMBER VELSHI:** Thank you. So a comment to staff, and I think you probably know where I'm going to go with this, because I had made a similar comment for the licensee we were discussing the last two days.

Four lost time injuries is unacceptably high. And I know the severity isn't that high. But it is unacceptably high and there is nothing in your report that says that. In fact, the comments are they're managing it

and it's not harming their workers and it's all good. So I again wanted to reiterate that.

But I do have a question for TRIUMF on that, because I think somewhere in the CMD that there's a discussion that CLS actually did some kind of an independent external review of their health and safety program. And someone from TRIUMF had actually participated on that. That seems like a very good initiative. And what they were doing about their health and safety program and what their thoughts were about their performance with four lost time injuries.

So over to you, TRIUMF.

**DR. TRUDEL:** Okay. This is Dr. Anne Trudel for the record.

With regard to our safety program, we carried out an international review of our program in early 2015 and put in place a strategic plan as a result of the findings of that review, and we're in the process of executing, have been since then in the process of executing that strategic plan. We've added staffing. The focus was in adding staffing for our quality management system. We hired a full-time QMS leader in 2015 and as well have now added half an FTE to our training program

With regard to the lost time incidences, three of them involved a one-day lost time. Two of those

were investigated. We did root cause analyses, and as a result of the root cause analysis have put in place corrective actions with regard to training and procedures associated with both of those facilities.

The incident that involved the longest of the lost time was related to -- which was six days -- was related to a sprained ankle for an employee going down the stairs. It wasn't associated with housekeeping or lack of maintenance of facilities in the workplace.

But we continue to be aware and look to raise awareness for staff in the context of safety. And one of the actions that we are pursuing as part of our strategic plan is to look at assessing SAT culture in the workplace.

**MEMBER VELSHI:** Thank you.

**THE PRESIDENT:** Dr. McEwan?

**MEMBER MCEWAN:** So again, just to follow up on that, it makes it more bewildering how you come up with your satisfactory, below expectation, fully satisfactory.

So again, just a question about the rubidium target release. What happened and what was the dose to the worker?

**DR. TRUDEL:** This is Dr. Trudel for the record.

The rubidium target release was in the context of a commissioning that we were doing for a new target for the facility. And it was associated with the progressive irradiation profile that was planned as part of the commissioning process for that new target. There was no dose to the worker. The dose associated -- potential dose to a member of the public associated with the release I don't have in my fingertips, but I recall would have been on the order of 10 nanosieverts. So at the 0.1 percent of the CNSC annual limit to the public.

**MEMBER MCEWAN:** Thank you.

**THE PRESIDENT:** Can you maybe update us as to how far are you on producing isotopes -- medical isotopes to help replace the NRU material.

**DR. TRUDEL:** Dr. Trudel for the record.

I can provide a very broad-stroke update. We certainly have demonstrated that we can produce isotopes to be able to supply the lower mainland here in B.C. We are just very close to completing the patient trials for the technetium-99m production.

**THE PRESIDENT:** So is that a requirement to get Health Canada approval?

**DR. TRUDEL:** That's correct.

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

Questions? Any other questions?

**MEMBER VELSHI:** For Canadian Light Source. Around your SAT finding, so I'll ask you first, you know, what in your organization culture management system would have prevented you from following up on that in a timely manner --

**MEMBER MCEWAN:** [indiscernible - away from mic]

**MEMBER VELSHI:** Oh, okay, I'll ask -- sorry, I'll ask staff then.

So two parts to it. One is why do you think they hadn't made progress on it. And second were there any enforcement actions taken by staff on that.

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

I will ask Mr. Martin Vesely to respond to that question.

**MR. VESELY:** Martin Vesely for the record. I'm a senior training evaluation officer with the CNSC.

Just to give you a bit of background on the issue. At the Commission meeting in 2014 that saw the publishing of REGDOC 2.2.2 Personnel Training, the Commission at the time heard that there would be a certain transition period of approximately two years that would be afforded to licensees in order to meet the requirements.

Light Source was one of these licensees

which was afforded this two-year transition period, with the caveat that there were certain timelines and milestones to be met. There was an action plan that was put forth by Light Source at the time. CNSC staff approved that timeline as well as the deliverables.

Upon conducting a compliance inspection it was discovered that the schedule had slipped significantly. And true to your point or as you stated, there was a directive at the time that was issued to move Light Source back into compliance.

So in the interim what has happened is that directive has been closed because they submitted a plan they have met and are back on track, and as you heard, there will be a compliance inspection conducted in the new calendar year.

**THE PRESIDENT:** I think I have one last question also and it's again to do with units. And this is on page 2000 -- 200 -- it's getting late.

--- Laughter / Rires

**THE PRESIDENT:** At 202, 202. And that's the DRL for TRIUMF. So again, I don't mind people using the DRL, but there's absolutely no units on this DRL.

**MR. BROEDERS:** I'll ask Mr. Mike Jones to respond to that question.

**MR. JONES:** Mike Jones for the record.

Similar to other sites, the derived release limit is based on 1 millisievert per year to the critical receptor. For the purposes of this table, there are just so many radionuclides that have derived release limits, to put them together they were all kind of bulked into tables like beta plus emitters, noble gases, volatiles and particulates. But the number is the percentage of the derived release limit, which 100 percent of the derived release limit equates to 1 millisievert per year.

**THE PRESIDENT:** I understand the 1 millisievert per year, but the DRL itself that you calculate will not be 1 millisievert, if I understand correctly. So just correct me if I'm wrong here. So I thought you would put the DRL, the actual unit that goes with the DRL, which is site-specific and material-specific.

**MR. JONES:** Yes. Mike Jones for the record.

Yeah, for each individual radionuclide, there is a specific derived release number.

**THE PRESIDENT:** So there's only five -- there's only four here, or even three and then --

**MR. JONES:** Each of those breaks down into multiple radionuclides. That can be corrected on this table, if you prefer to see it that way. But for the purposes of presenting the information they were just put

down as a percentage of the overall derived release limit because each of them --

**THE PRESIDENT:** Well, every single -- every other DRL has a unit associated with it, you know, the other facilities, et cetera, even where -- I don't know where you can find it in a table. So I'm not accepting that you actually don't come up with the actual units.

**MS SAUVE:** So Kiza Sauvé for the record.

So the unit, it would be compared to 100 percent of the DRL. So it's a percentage of the DRL. So there is -- because, as Mike Jones indicated, each line has a group of things together that might have different units for each particular parameter. So what we're looking at is the percentage of the --

**THE PRESIDENT:** I know, you decided to do a percentage of something. What is that something in units? So it's going to be, I don't know, you can emit 20 kilogram per year and then you can have the actual release is 5 percent, 10 percent of that. So it's missing the actual unit. Anyhow, we can debate this fairly and we will.

Any other questions?

Okay, the only other comment I would make is I think -- at least I've reached a conclusion that, you know, we've done it twice now. I think you've got to

separate the ROR into four different CMDs so we don't have to go back and forth and Mark feeds me what to say between each chapter. And not only that, they are -- I think the four chapters are very distinct. I didn't see anything that you can learn from one to another. So I think you should consider that. I can say those things.

This concludes the public meeting for the Commission. Thank you all for participating, and safe travel back home.

**MR. LEBLANC:** So from my end, if you borrowed interpretation devices, please return them in the reception and claim your ID card.

I'd also take the opportunity to thank the people from the Port Hope Community Centre for hosting us. Also all the technical staff that have been providing assistance since Monday as well as the interpreters that have had to deal with sometimes bad sound or -- not bad sound, but people not speaking close enough to the speakers or speaking too fast. So thank you for your patience in this regard. And we'll see you back in Ottawa. Merci.

--- Whereupon the meeting concluded at 6:19 p.m. /

La réunion s'est terminée à 18 h 19