Canadian Nuclear Safety Commission

Commission canadienne de sûreté nucléaire

Public meeting

Réunion publique

February 20th, 2019

Le 20 février 2019

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

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

Commission Members present

Ms Rumina Velshi
Dr. Sandor Demeter
Mr. Timothy Berube
Ms Kathy Penney
Dr. Marcel Lacroix

Commissaires présents

Mme Rumina Velshi
Dr Sandor Demeter
M. Timothy Berube
Mme Kathy Penney
M. Marcel Lacroix

Secretary:

Mr. Marc Leblanc

Secrétaire:

Me Marc Leblanc

Senior General Counsel:

Ms. Lisa Thiele

Avocate-générale principale :

Me Lisa Thiele

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Ottawa, Ontario / Ottawa (Ontario)

--- Upon commencing on Wednesday, February 20, 2019
at 9:02 a.m. / La réunion débute le mercredi
20 février 2019 à 9 h 02

Opening Remarks

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

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

I would like to begin by recognizing that we are holding this Commission meeting in the Algonquin Traditional Territory.

Je vous souhaite la bienvenue and welcome to all those joining us via webcast.

I would like to introduce the Members of the Commission that are with us today.

On my right is Dr. Sandor Demeter; to my left are Dr. Marcel Lacroix, Ms Kathy Penney and Mr. Timothy Berube.

Ms Lisa Thiele, General Counsel to the Commission, and Mr. Marc Leblanc, Secretary of the Commission, are also joining us on the podium today.

I would like to begin today's Commission Meeting with a Safety Moment on mental health.

Mental health is an important part of our health. It includes our emotional, psychological and social well-being. When our mental health is compromised, so is the quality of our work and the time spent with loved ones.

Over the last decade a great deal of progress has been made in raising mental health awareness. More people are talking about mental health than ever before, and many employers, including the CNSC, now have wellness initiatives to promote mental health in the workplace. However, there is still a long way to go. Mental illnesses are still widely misunderstood and stigma still remains the biggest barrier to seeking help. What we need is more mental health conversations, more people willing to share their story and more people willing to listen. We do not have to be experts on mental health to make someone feel heard, just as we do not have to be going through something major to tell someone we are not ourselves today. Just starting a conversation on mental health can make all the difference.

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

Marc.

M. LEBLANC : Merci, Madame la Présidente.

Bonjour, Mesdames et Messieurs.

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

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

Des appareils pour l'interprétation sont disponibles à la réception. La version française est au poste 2 and the English version is on channel 1.

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

The transcripts should be available on our website by the end of next week.

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

As a courtesy to others, please silence your cell phones and other electronic devices.

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

Please refer to the agenda published on February 8th for the complete list of items to be presented today.

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

Madame Velshi va présider la réunion publique d'aujourd'hui.

President Velshi.

CMD 19-M2

Adoption of Agenda

THE PRESIDENT: With this information, I would now like to call for the adoption of the agenda by the Commission Members, as outlined in Commission Member Document CMD 19-M2.

Do we have concurrence?

For the record, the agenda is adopted.

CMD 19-M3

Approval of the Minutes of Commission Meeting held on December 12 and 13, 2018

THE PRESIDENT: I will now call for the approval of the Minutes of the Commission meeting held on December 12-13, 2018, as outlined in CMD 19-M3.

Are there any comments, additions or deletions that the Commission Members wish to make to the draft minutes?

I would like the Members to agree to a correction at paragraph 130 of the Minutes, on page 38, which should read, and I quote:

> "that only two, not three of the onsite monitoring wells were over the *Ontario Water Drinking Guidelines.*"

I note that there are no other changes. Therefore, I ask the Commission Members to approve the minutes. Do we have concurrence?

Agreed.

I also wish to note that the Minutes of the November 8th Commission meeting were approved secretarially on January 28th and are available on the CNSC website.

The first item on the agenda is to provide

updates to the Commission and the public, in a more formal and documented manner, on items that were discussed during previous proceedings.

These updates can be in response to an action item from a hearing or a meeting, such as a request made by the Commission or a commitment made by CNSC staff.

Marc, over to you for the first update.

CMD 19-M8

Written submissions from CNSC staff

MR. LEBLANC: Thank you.

The first update is resulting from an action item following the August 22nd, 2018, Commission meeting, where the Commission asked CNSC staff to follow up with the Municipality of Port Hope and the Canadian Nuclear Laboratories to provide the results of radiological surveys in Port Hope to the public. CNSC staff filed a memo on December 21st, 2018, as outlined in CMD 19-M8, stating the new approach for providing the information to the public.

Madame la Présidente.

THE PRESIDENT: I wish to note that representatives from CNSC staff and CNL are available for questions.

I will seek approval from Members to close

this action item, unless there are further questions.

Any questions?

MEMBER PENNEY: Thank you for the information around this. So I'm not sure we entirely got what we were looking for, which was a full, transparent and easy way to get the data. Perhaps you could outline for us how in the future people are going to get the data without having to go through ATIP, Access to Information.

MS TADROS: Haidy Tadros, for the record. Perhaps CNL can start and then CNSC staff can explain how we followed up with CNL's and the Municipality's action on this.

MEMBER PENNEY: Thank you. CNL.

MS MAHABIR: Good morning. Alex Mahabir, for the record.

If we receive a request for the radiological survey results for a municipal property, we provide a summary of the results to the requestor within two weeks of the request having been made. They simply have to make the request, we notify the municipality we've received it, and then if we have final results for that property we provide the requestor with those results. It is a summary of the results and we note in the cover letter that the full, very detailed report is also available. If the requestor would like that, we do provide them with that

within four weeks. If there's any requirement to redact sensitive information per federal privacy legislation, CNL handles that in-house through the ACL ATIP office. There is no requirement for the requestor to put in an ATIP request.

MEMBER PENNEY: Thank you for that. So how long would that process take for the redaction and providing the report without the confidential information?

MS MAHABIR: We say it takes up to four weeks. It can be less than that and if we receive a request for a report that has already been redacted, then we can provide that much faster.

MEMBER PENNEY: And would the person making the request have to request both the summary and the detailed report separately?

MS MAHABIR: Yes. We provide -- we first provide the summary, which does tell them -- shows them the area of contamination, the site outline and what type of contamination was found, and we do indicate at that time if they would like the full report we can get that for them as well.

MEMBER PENNEY: So if they requested both in their first request, you would proceed to -- the clock would start on the four weeks in redacting and getting rid of the confidential information, they wouldn’t have to wait

the two weeks and then go another four weeks?

MS MAHABIR: No, no. As soon as they ask for it we put the process in place. And we also offer, because the full report -- well, both reports -- we offer to have our technical specialist go through it with them, especially for the full report, it's very detailed. So we always make that offer and make arrangements to have a CNL technical person sit down with the requestor, go through the report, explain what it means and answer any of their questions.

MEMBER PENNEY: Okay. Staff, are you satisfied with this?

MS TADROS: Haidy Tadros, for the record.

Yes, we are. We actually have Ms Liana Ethier sitting behind me and she can describe -- she is onsite at the Port Hope Area Initiative and she looks to do oversight activities both at the Port Hope and Port Granby areas and she is in the community and has witnessed and observed communities and residents of the community in the Port Hope offices and waiting for information. So I'll let her speak to what she has observed.

MS ETHIER: Good morning. Liana Ethier, for the record.

As mentioned, I am stationed in the Port Hope area, so I have interacted with several members of the

Port Hope community both at the Port Hope Fall Fair and in the community itself. I have been at the Port Hope Area Initiative office on Toronto Road, where the public can access at any time, and I have interacted and run into people that I saw at the Port Hope Fair in the office, who had received reports from CNL and had contacted them and requested further information and they were in the lobby there waiting for CNL technical specialists to have that meeting and walk through their report with them.

MS TADROS: Haidy Tadros, for the record.

One thing that may help as well -- because Ms Liana Ethier is not sitting 24/7 in the Port Hope offices witnessing people come in -- CNL has updated their website with the information that was shared today and CNSC staff have also put on our webpage for the Port Hope Area Initiative a link to the updated information that CNL is providing.

MEMBER PENNEY: And on our website and on theirs it should indicate that if you want the full report you have to request that as well.

MS TADROS: CNL can speak to what is on their website in terms of the updated information. Specifically to the CNSC website, it points to whatever CNL has to inform the public. If they come to our webpage on Port Hope Area Initiative, they are reverted to what CNL

currently has on their webpage.

THE PRESIDENT: So CNL, does your website make it clear that members of the public can request the full report from the outset?

MS MAHABIR: Alex Mahabir, for the record.

Our website says:

> "The results for the radiological survey of road allowances and other municipally owned properties are available on request from CNL..."

So we don't on the website differentiate between the summary and the full report. However, when people contact us for it, we do let them know then that both options are available.

THE PRESIDENT: Thank you.

And how many requests have you received? Just to give a sense of the level of public interest and angst around this.

MS MAHABIR: Since we posted it on the website we've received one formal request. However, we had been tracking other requests. We have seven -- we have requests for seven road allowances right now. However, we don't have the final reports for them, so we've indicated to those people that once the final reports are available we will contact them and provide them to them.

THE PRESIDENT: Thank you.

Any other questions?

Dr. Demeter.

MEMBER DEMETER: Just a clarification. Are these reports, summary or full, available to property owners only or what if someone is renting a house? So what about renters? I'll ask it of CNL.

MS MAHABIR: So no, reports are available, we would share them. So this discussion initially is about municipal properties and we would share those with anybody who asks for them. They are considered public properties. On private properties we share the information with the owners and then provide it to them. And then if there are tenants, then as well we would provide them with the information. We let the owner know that the tenant has requested it, then we provide it and walk the tenant through the information.

MEMBER DEMETER: Okay, that's good. And you described what was involved in the summary report, which seems to be fairly reasonable. Can you give an example of what would be in a detailed report that wouldn’t be in the summary report? Because the summary report seemed to answer the questions about the radiological survey, the site boundaries, the contaminants. So I was curious what would be in the detailed report that

wouldn’t -- what more is there in the detailed report that is not in the summary report, as an example? To CNL.

MS MAHABIR: Alex Mahabir, for the record.

The detailed report includes all the data for all four tests conducted on the property: radon, interior gamma, exterior gamma and borehole sampling. The summary will tell you whether or not there is low-level waste and where it's located. The detailed report is the information. We receive the data from each of those tests, how it was analyzed and how we determined that it did indicate the presence or absence of historic waste.

MEMBER DEMETER: Okay. Thank you very much. That clarifies that.

THE PRESIDENT: Thank you.

Can we close this action item then?

Okay, the action item is closed.

Thank you, staff, and thank you, CNL representatives.

CMD 19-M7.1

Written submissions from Ontario Power Generation

CMD 19-M7

Written submissions from CNSC staff

MR. LEBLANC: The next update is regarding

an action item from the November 8, 2018, Commission meeting, where the Commission asked Ontario Power Generation to provide responses to CNSC staff to the 14 questions raised by Dr. Frank Greening in an email sent on October 30th. The responses from Ontario Power Generation are outlined in CMD 19-M7.1 and the CNSC staff technical assessments of OPG's responses are documented in CMD 19-M7.

CNSC staff and representatives from OPG are available for questions from Commission Members.

Madame la Présidente.

THE PRESIDENT: Thank you, Marc.

I'll turn the floor to Commission Members for questions and start with you, Dr. Demeter.

MEMBER DEMETER: Thank you.

I'll defer some of the health-related questions to the second discussion on the refurbishment.

I was going to ask for some clarification when there were -- for question (vi) there's a graph that's included that I think OPG provided. In OPG's response there's a graph and I'm having trouble understanding the difference -- there's no annotation, so what the dotted line is, what the solid line is and what the points are. Because if those two curves are modelled on those points, it doesn't quite make sense. So maybe someone can walk me through that graph that looks at Cm-244 specific activity

by effective full power years and what those -- and it's referred to both in the OPG document and in the CNSC document. I am on page 14 of the CNSC document and it's the response to question vi. I'm not sure if OPG --

MR. MANLEY: Robin Manley, for the record. I'm the Vice President, Nuclear Regulatory Affairs and Stakeholder Relations at Ontario Power Generation.

Dr. Demeter, I apologize that I'm not going to be able to do this one justice. This is a graph that was extracted from a publication at a conference and what it is attempting to address is the question from the intervenor of do we have data about the inventory of Curium-244 related to our pressure tubes. So we have not sort of, you know, given you a list of every data point or anything like that. What we've done is show that there is published data pertaining to the sort of age of the pressure tubes and a range of activities from different data points, and frankly that is about as deep as I am capable of going on that particular question.

MEMBER DEMETER: Okay. I was just curious about the science of the graph. But thank you for that.

THE PRESIDENT: Dr. Lacroix.

MEMBER LACROIX: Yes, thank you.

Well, first and foremost, I would like to thank OPG and also staff for preparing these submissions.

I really appreciate all the details and the precise answers to these 14 questions.

Concerning the submission by OPG, in Enclosure 2 -- and probably Enclosure 3, but I'll start off with Enclosure 2. Concerning the reports submitted by Kinectrics, I'm talking about the report that was produced on the 25th of April 2018 with 10 smear samples taken from the 20th of February 2018. I've noticed in this report that there are a number of radionuclides that were identified and discriminated and I look at Iron-55, Niobium-95 and Zirconium-95. And then I look down in the report, there were three additional samples taken on the 6th of December 2018 and in this new list of radionuclides I don't see anymore Iron-55, although I see Niobium-95 and Zirconium-95. Now, when you look at these numbers you see that the activity of Niobium and Zirconium has decreased. So I figured out that it's due to the decay, radioactive decay since their half-lives are respectively 35 days and 65 days. But on the other hand, in this report of the 11th of December 2018 I no longer see Iron-55 and the half-life of Iron-55 is 2.7 years. So it did not have time to decay. So my question is why don't we see Iron-55 anymore? Is it due to the fact that it was no longer discriminated, it was not measured, the samples that were taken are different? I would like to hear about it.

--- Pause

MR. MANLEY: Robin Manley, for the record. Thank you for your patience while I conferred with my colleague Ephraim Schwartz, who is the Department Manager of our Health Physics Department.

So, Commissioner, I would say first off my preliminary answer would be that these are samples taken of different locations and different equipment, so necessarily there's going to be some variation in the radionuclides that one finds. So I would not put it down to a radioactive decay issue. However, we could undertake to follow up as to, you know, verifying that the lab actually did survey for iron-55 and we could report that -- the result of that question back to CNSC staff and provide them the results of any follow-up from that.

THE PRESIDENT: Thank you.

Ms Penney.

MEMBER PENNEY: First I want to thank OPG for providing such a detailed submission. It was helpful to get that as well as staff's submission, so thank you for that. I understand it was a lot of work.

My question is around question number 9 or (ix). It's about the particle sizing measurements, and it's a fairly low-level question, that is under what circumstances would you perform particle sizing, and how

would you do it on people who have been exposed? How is that done? First for OPG, and then for staff.

MR. SCHWARTZ: Ephraim Schwartz -- sorry, for the record, Ephraim Schwartz, Health Physics manager, Ontario Power Generation.

So, you know, per the response, OPG does not routinely perform particle sizing for dosimetry purposes. We take the conservative approach. We're using default parameters. That helps bound what we do in our dose assessments, and it's most accurate for what we're looking for.

MEMBER PENNEY: Okay, I'm not sure. So you never do particle sizing? It's not required because you can get to the dose in --

MR. SCHWARTZ: It is an extremely unusual case where we would proactively decide in advance that we would need to do it.

If we were embracing some brand-new technology, some new activity that we've never done before, that we couldn't find any industry-related information on, you know, sizing for respiratory protection, then that would be something that we would investigate and put in as a specific task and develop a plan to do that sampling.

MEMBER PENNEY: So the purpose of particle sizing, if it was ever required, would be to make sure you

had the right PPE in place to filter the particles? Is that what I hear you saying?

MR. SCHWARTZ: For the record, Ephraim Schwartz.

The particle size is really around the dosimetry assessment. So we make a number, you know, of assumptions. And it's for the dose. So typically, the default in the worst particle size that you can get from a lung dose is from a five-micron size particle. Filtration that we have in our respiratory protection model is all geared around protecting against less than five microns, so it would filter out something as large as five microns or even larger.

It would be more along the lines of if I was planning on not using any respiratory protection, what would I do, especially if I had any indications of a significant dose uptake.

MEMBER PENNEY: So you use conservative PPE to protect, and you therefore feel you don't need to do particle size analysis?

MR. MANLEY: Robin Manley, for the record.

Let me just expand on the answer. You're correct that the protective clothing used or the respirators used protects against particles of that size, the most conservative dose-causing particles.

If you want to imagine the hypothetical situation where we had an indication of a very large dose, we would want to make sure that we were assigning a very large dose as accurately as possible.

In that case, we would attempt to do more detailed and discrete dosimetry, which would include attempting to find out what the actual particle size was. Because if we were hypothetically overly conservative in our particle size estimate and assuming that the person gets 60 millisieverts or something above a legal dose limit, we want to make sure we know exactly what their dose is going to be.

So in that case, we would attempt to collect actual aerosol sample sizes and have those analyzed and make an accurate-as-possible estimate. And, you know, you might find that the particle size was larger and therefore the dose was less, which would be a good thing if -- such a large dose.

That level of detailed determination is just not valuable when you're talking about something like 0.1 millisieverts and you're already assuming the most conservative largest dose.

MEMBER PENNEY: Thank you for that.

Staff, did you have anything to add?

MR. FRAPPIER: Gerry Frappier, for the

record.

So as is often the case in safety engineering, we take a look at what is the most conservative worst-case scenario. If that scenario should demonstrate there is no cause for concern, then from a pragmatic perspective, why would you go further?

And I think this falls into that category, so that as long as we're satisfied that they've used a very conservative particle size which demonstrated a very, very low dose, there's not really any need to go to any more detail, because all that would prove would be that the dose is even lower than we thought. And that's not necessary, because we already all agree it's a very low dose.

MEMBER PENNEY: And so you're satisfied that OPG did not require a particle size analysis in this case?

MR. FRAPPIER: That is correct.

THE PRESIDENT: Thank you.

Mr. Berube.

MEMBER BERUBE: I'm just going to back this up to a little more general specification on it.

I think the anxiety we're seeing here has got to do with really the assignment of what respective doses look like before you walk into a system and how you actually do that.

So I guess my question is projected dose characterization. You're walking into a new situation which you haven't opened before. What are your procedures for basically analyzing the risk and doing a risk assessment and a projection of dose?

I know we've got someone from Health Physics today, which is perfect to help answer that question. So if you could, OPG, just give us a general overview. What are you going to do? You're going to open up something the first time and try and do a dose risk assessment for work.

MR. MANLEY: Robin Manley, for the record.

So I'll make some general remarks and then ask Ephraim to expand on this further.

So as a general RP practice, if you have any kind of past history with operating experience at another facility, or your own plant is better, you take that data as to what the projected dose rates are like, what the hazard conditions are like, what kind of exposures can occur, and you build a radiation protection plan or what we call a radiation exposure permit based upon your preliminary estimates.

And you need to -- so that's what we would call our "anticipate phase" of our radiation work planning model.

And then you need to go and actually perform some sort of surveys to validate that your preliminary assumptions are correct. To collect those surveys, you often need to send a worker in, unless you can do it robotically or remotely. And if you can do it robotically, that's great. If you can't, then you need to put together your initial entry plan in a way that is very protective, that's conservative, that takes account of contingencies and back-out conditions and all sort of hazards that you could incur.

So having established that, you then go and collect your survey data to validate your assumptions or find out that you are wrong -- it's higher, lower; it's different, whatever -- and then you do sort of a check and adjust and revise your radiation protection plan accordingly to make it ALARA, to ensure that no one gets a large dose, that doses are as low as reasonably achievable.

And so you build in your ALARA controls, your protective equipment, whatever dosimetry requirements, your back-out conditions, and your contingency plans, your contamination monitoring requirements -- you build those all in, document them, and you know, plan, explain to your staff what are you required to do. You collect that data.

And then as you progressively work through the work sequence, you continually do a check and adjust.

So if you find the conditions are different, if you have an exposure event occurs that you had not anticipated, you take some sort of corrective action to improve your plan and protect the workers the better the next time.

That's a sort of a general principle.

Anything you guys would like to add?

MR. SCHWARTZ: For the record, Ephraim Schwartz.

I would just add that, you know, typically the types of scenarios that you're talking about, we recognize that they're unusual, as Robin Manley said.

We take a look at past history. We have characterization surveys for much of our plant to understand what the gamma hazards are, the beta, neutron -- whatever is appropriate for the system that we're looking at. We go into those work-planning details.

And in addition, we have challenge meetings even before we get to the point that we're opening up the system. So typically, the kinds of indicators that this might be potentially high hazard, our responsible health physicists will be proactive and conservative. They will force us into a radiological high-hazard work-planning model.

And so we build up those plans. We make sure we understand the elements of the work that's going to

be done. There are training and mock-ups that will need to be performed.

And again, once we open up the system, we have notions of what we're expecting to see, and those are fed into the back-out conditions. And so again, if we were to hit a back-out condition, or there may be natural pause points that are put into the work package that says, This is where we're going to safe-state the situation, back out, verify that we're prepared to move forward, or, as Robin referred to earlier, check and adjust the plan.

MEMBER BERUBE: So quickly -- I mean just because the obvious part that comes out of that is after you've done that assessment, you've looked at that risk, you've decided whether or not it seemed viable to work on because it might be too hot, it's possible, how does that factor into the way you determine your PPE for your workers? Obviously, they're the ones actually with the hands on the equipment. So your risk assessment drives PPE and then procedures and exposure rates and then times and this kind of stuff. Is that correct?

MR. SCHWARTZ: For the record, Ephraim Schwartz.

Yes, that is correct. And to give you an example, you know, if we were dealing with hot particles, and sometimes we do end up with significant gamma exposure

rates, there may not be appropriate PPE that they -- workers can do the job. And that's where preferentially we'll look at robotics to go and tackle the job. In other cases, our sort of default PPE of interest is a plastic suit. And once we have additional information that helps us understand whether or not it's appropriate to move away from a plastic suit, that would -- we would take action on that case.

THE PRESIDENT: Thank you.

Just a couple of follow-up. One is just more an observations. Your principles and approach, all good, but didn't quite apply here, where there was a change in conditions that weren't anticipated as you moved from your first line to your second line, or your first container to a second container. The conditions were different, and you hadn't anticipated and hadn't worn appropriate protective clothing. So that whole change management, I guess, would be different going forward.

So the question was you're not going to be doing this work until you get to the next refurbishment. How are you tracking whatever improvement opportunities were and that they have actually been implemented or will be implemented?

MR. MANLEY: Robin Manley, for the record.

I'm going to pass this question to Mary

Duarte, our director of Radiation Safety in a second.

But just as a sort of opening remark, we have absolutely, you know, learned our lesson around the rad waste processing building and, you know, the potential for the change in condition. That is, you know, integrated into our DNA, I think, from that one. And it's being built into all of our planning and preparations for the Unit 3. The entire team knows about it. Every rad tech will be talked to about it. And Mary can add additional details.

MS DUARTE: Bonjour. Mary Duarte, OPG director for Radiation Safety.

Thank you for that question.

The first event related to the RWPB. It was a defining moment for OPG. We have learned a lot of lessons. We have internalized those lessons and we have applied those improvements to our current practices in the refurbishment of Unit 2.

Some of the keys lessons were around increasing the proficiency level of our workforce. So OPG has invested a significant amount of effort in providing additional training. We launched this training campaign that entails four and a half days -- we call it "boot camp" -- where we really gathered a lot of those lessons and we refreshed on some key themes. That piece of training moved from being so much classroom but more a

dynamic learning activity, more hands on. So that was a key lesson that we learned from the first event.

Secondly, there is a higher level of oversight on the Unit 2 vault work activities. So there's a lot more eyes on the job. I mean, that work is really -- a lot of it is in camera. We have a dedicated support for those work activities.

And we continue to learn through these events. Our organization has a strong safety culture, so these events hit us hard. These are defining moments in our organization, but we remain open to feedback and to learning, and we want to continue enhancing our full monitoring program.

THE PRESIDENT: Thank you.

And I have a question on your response to question 12, which is around the levels detected and the minimum detectable activity. And it's more for clarification.

So prior to April 2017, your response is that the MDA was 100 millibecquerels. And then after that, with better equipment and so on, it was much lower at 6.7, I think, millibecquerels.

So prior to 2017, would the results have been reported as less than 100 millibecquerels? Because the question seems to imply that levels may have gone up,

but it's just that you're now detecting lower levels. So it would actually be from less than a hundred to maybe a bit over 6.7. I wasn't quite sure how to read that response.

MR. MANLEY: Robin Manley, for the record.

I'm going to check we have Raphael McCalla, our director of Environment Support, on the phone, and that if Raphael is available, then I'm going to pass that question to him.

MR. McCALLA: Raphael McCalla, for the record. I'm the director of Environment at Ontario Power Generation. Yes, I can answer this question.

With respect to the 100 millibecquerels, Madam Velshi, you are correct. Prior to April of 2017 that was the MDA that was utilized.

The way we actually come up with an actual emission, it's the minimum detectable activity plus the flow. That's what actually gives you the actual overall emissions. So after April of 2017, where we went to a lower minimum detectable activity, again, it's just a calculation based on the flow times that value is what's reported.

I think the statement in our response perhaps needs a little bit of clarification around the notion of higher values. And what I will say is that

overall, the emissions that we're talking about are extremely low. They are low. There's really no requirement for us to actually monitor based on these values. We submitted a report back in 2005 where we informed the CNSC that after doing an assessment that the alpha emissions from both Pickering and Darlington were considered to be negligible and hence did not require any monitoring to be in place on a routine basis.

THE PRESIDENT: Thank you. No, I get that.

And then again, for that same question, the fourth paragraph in your response, I didn't understand what the 2-asterisk-104 becquerel meant. Do you remember the total weekly alpha airborne emissions average?

MR. MANLEY: Robin Manley, for the record.

I think that is not quite a typo, but --

THE PRESIDENT: Oh, two times 10 to the four?

MR. MANLEY: That's -- it's 20,000, I believe. Thank you.

THE PRESIDENT: Thank you.

Anyone with more questions?

Dr. Lacroix.

MEMBER LACROIX: Yes, I do have a couple of quick questions still concerning the report submitted by

Kinectrics.

When I look at the list of radionuclides, and I sum the activities of all the radionuclides, it far exceeds the gross alpha and beta count. So why is that? Is it a question of overlapping radionuclides? That's in Enclosure 2 of OPG submission.

MR. MANLEY: Commissioner, Robin Manley for the record.

I do not know. We would have to go back and look at this.

I guess I would say that Kinectrics is an accredited lab. It has a good QA program. We have reason to believe that the numbers are correct. I would suspect -- and I got to say, that is all it is at the moment -- is that because each of the individual radionuclides has a sort of an MDA and less than --

MEMBER LACROIX: Uh-huh.

MR. MANLEY: -- then perhaps rounding all of these up could cause the total number to appear to be larger than the gross count, which is well above the MDA for beta, for sake of argument. And I suspect that that is the explanation, but I have not, you know, verified that at a cursory glance.

MEMBER LACROIX: Okay, that's okay. I'm not questioning the numbers; I'm just trying to understand

the report.

Concerning the limit of 100 millibecquerel, my question on these airborne samples, is this a limit per unit volume per unit of mass per unit of mass flow rate? What does it mean when you take an airborne sample and you say that the activity is so much it depends on the volume measure or on the mass flow rate or on the volumetric flow rate?

MR. MANLEY: Robin Manley, for the record.

Again, I would pass this question to Raphael McCalla.

MR. McCALLA: So the actual 100 millibecquerels, again, is the minimum detectible activity. And the way we report out on emissions, we take the actual flow rate. So the actual volume of air, if you will, that's been emitted up the stack times this value. And that's what we report out as an overall emissions for that particular unit, so to speak.

MEMBER LACROIX: Okay, thank you.

And now, if you go to page 5, concerning question 7. It concerns the surface concentration of curium-244. You provide the activity per smear sample. I look at the numbers -- 15 and 22 becquerel per smear. I took my smoke detector; I did back of envelope calculations; and then I double-check it with a Geiger

counter. And I came up with 30,000 becquerel in my smoke detector. And you guys pretend that 15 and 22 becquerel per smear, it's high activity.

So I'm a little bit baffled here. There's something that -- it's missing. To me, it's very low activity. But could you tell me why it is high activity?

MR. MANLEY: Robin Manley, for the record.

I'm not sure that I would characterize it as high activity as much as that is the result that we obtained by performing a smear sample per our technique, and then counting it with highly sensitive equipment that is capable of measuring values in that range if you count them for the appropriate period of time.

MEMBER LACROIX: And the next question is that why particularly curium-243 or -244? There are other nuclides. Is there a reason for that?

MR. MANLEY: Robin Manley, for the record.

So there are a couple of reasons. In one of the reports that we provided as part of our submission, I think it's Enclosure 1, there is data from surveys that were performed that identified that curium was the primary alpha-emitting radionuclide of interest. And in addition -- and perhaps Ephraim can help me here -- we have done further characterization reports which have been submitted to CNSC staff relating to our Unit 2

refurbishment and our processing building surveys in which we've identified that curium is the primary alpha-emitting radionuclide of interest for purposes of dosimetry and potential dose consequence, which is why the sort of focus is on that.

In addition, the intervenor himself posed various questions pertaining to that radionuclide, and so we were responsive to the questions that were being posed.

MEMBER LACROIX: What about plutonium radionuclides?

MR. MANLEY: Commissioner, can you be more specific?

Like are you asking, do our survey results identify the potential presence or is it a dosimetry --

MEMBER LACROIX: That's right. Is it identified in plutonium radionuclides?

MR. MANLEY: So Commissioner, again, Robin Manley for the record.

So in our Enclosure 1 which speaks to the radionuclides that were identified on the last page of that enclosure, plutonium-emitting -- plutonium alpha-emitting nuclides, plutonium-238, 239, 240, 241 are all documented as, you know, potential actinides of interest in terms of their potential contribution to the overall dose potential, so they are identified.

And in addition, in the Kinectrics reports such as Enclosure 2, you can see that plutonium-239, 240 and 241 are measured for and are identified as being detectable. However, they are -- they are of lower total numerical value than the curium-243, 244 which has a higher result and, therefore, is a sort of -- the dominant alpha emitter.

MEMBER LACROIX: So it's a question of metallurgy in the sense that the material or the walls let curium diffuse through the walls as opposed to, for instance, plutonium radionuclides?

MR. MANLEY: Commissioner, Robin Manley, for the record.

I'm afraid that question's beyond my technical knowledge. I'm not able to answer that one.

MEMBER LACROIX: Okay. And finally, my last question concerning the smear samples.

You've mentioned that these samples are 100 centimetres square. These are, you know, small samples. How do you get these samples? Is it a sheet of metal?

MR. SCHWARTZ: Ephraim Schwartz, for the record.

Smear samples are typically taken by a worker. He basically has a paper disk and he traces out

what looks like an S. So it's a large area that adds up totally to about 100 square centimetres.

He doesn't focus just on one small unit because that may not be representative of what -- of the component that he's smearing.

MEMBER LACROIX: And how do you decide which area to smear?

MR. SCHWARTZ: Again, it just depends on, you know, what the individual's tasks they go take a sample for.

So that would be part of the pre-job brief where the individual said go take a smear of, for example, this table because I want to release this table. And so go take, you know, two, three smear samples of the table. Just don't focus on one hand. Just general characterizing the field. So that would be at the task level.

MEMBER LACROIX: Okay. Thank you, gentlemen.

THE PRESIDENT: Thank you.

Any other questions? Can we close this item?

Okay. I'd like to echo my fellow Commission Members' feedback to OPG. We very much appreciate your transparency and the thoroughness with which you've responded to our questions and the responses

you've provided. Thank you very much for that.

Thank you.

CMD 19-M4

Written submissions from CNSC staff

THE PRESIDENT: So we'll move to the next item on the agenda, which is the Status Report on Power Reactors as outlined in CMD 19-M4.

I note that we have representatives from the nuclear power plants and CNSC Staff in the room as well as by teleconference. They can identify themselves later before speaking.

Mr. Frappier, do you have anything to add before I turn the floor to my colleagues for questions?

MR. FRAPPIER: Yes. For the record, my name is Gerry Frappier.

I am the Director-General of the Directorate of Power Reactor Regulation, so thank you and good morning, President Velshi and Members of the Commission.

I do have an update to our CMD as usual. With me today are our Power Reactor Program Division Directors plus technical support staff who will be available for any questions you might have.

This document was finalized on February the 11th, and so I provide the following very short update.

One is that Pickering Unit No. 1 has returned to full power. But I'd also like to provide a bit more update of -- with respect to the KI Pill Working Group as just the dates showed up.

The public comment period on the draft terms of reference was concluded after this update was presented to you. So between December 24th and February 14th was the comment period -- the public comment period on the terms of reference. In total, we had 17 submissions which were received, six of which were from federal and provincial organizations, six from non-governmental organizations and five from members of the public.

As noted, we've just received those so we're in the process of reviewing them, and along with our working group members, we will be dispositioning those comments over the next few weeks.

We do have some meetings set up both with the working group and with the advisory committee that has been established with members of the public. And that's it for my update, and we're available for any questions you may have.

THE PRESIDENT: Thank you, Mr. Frappier.

We'll start with you, Dr. Demeter.

MEMBER DEMETER: Thank you.

I'll revisit the alpha issue this time. I held the question for this because of the follow-up report on the internal contamination.

And this is more of a health risk-related contemplation that I've had.

So we have feeder tubes or whatever else you're working on. You've already determined the gamma risk because people are working on them, so it's not hot enough that you can't work there from the gamma dose.

I want to get a sense -- and it always seems that it's sort of a -- when there's an alpha event, it's sort of a retrospective. So I suspect that the heterogeneity of the contamination, that the variability between different pieces of equipment that you're working on makes prospective hazard analysis not that precise because we're dealing with it in retrospect.

But I want to get a sense from someone on the competitive health risks of the gamma versus the worst-case scenario for the alpha. My supposition is that the worst-case scenario for the alpha is a much greater risk than the worst-case scenario for the gamma because you can easily monitor the gamma.

And is there some -- is there some middle ground with regards to these self-contained breathing units

that would make the work practical, not over-exceed the gamma dose? But I'm still concerned from a health risk point of view, we don't have a prospective risk analysis and maybe someone can tell me, what is the worst-case scenario for alpha dose.

We've had low doses so far, but I'm not -- you know, from other historic events, alpha -- inhaled alpha doses are really dangerous, so maybe someone can give me a sense on that range of competitive risk and maybe look at what type of protective equipment, self-breathing apparatus might be able to mitigate that because you can't seem to -- you can't seem to characterize it prospectively.

MR. MANLEY: Robin Manley, for the record.

So I'll start, and I'll ask Ephraim Schwartz to add some additional material.

If I may, I'm going to start by talking by comparison of gamma and tritium. And I'm going to do that for the reason that we have a vast amount of experience of dealing with airborne hazards where we have to provide respiratory protection for workers and where there is a large tritium source term. And we -- so I'm going to come to alpha, but let me start with tritium.

So in normal operations when we're working on our operating reactor and we have gamma hazards from the

operating plant as well as we have tritiated heavy water in our heat transport and moderator systems and there's a potential for a leak to occur.

We put workers in protective clothing that provides a substantial dose reduction from the tritium hazard. There isn't any practical protective clothing that you can use that provides a dose reduction against that gamma hazard, but you have on you an alarming instrument, you have a gamma meter in your hand, you have an indication of changing conditions and what the level is right where you're standing.

So it doesn't reduce the dose, but it provides you with monitoring live time.

The tritium, you can have an instrument in your hand. It doesn't work quite as well. It doesn't react as quickly. It's sensitive to gamma, so it's not as good at detecting changes to tritium conditions.

You can have alarming tritium monitors in the room, and that gives you some indication as well. They can also be influenced by gamma fields.

So not as effective at early warning, but you can put an air supply plastic suit on you that reduces the dose rate by somewhere between 100 and 1,000, depending on circumstances, and as long as you don't get soaked in water, you're in good shape in terms of protective

measures.

So we have a lot of experience that putting this protective clothing around a worker is effective and prevents large doses even though the source term in the tritium situation can be very large indeed.

Now let me bring it over to the alpha story.

We don't have -- there is no technology available in the marketplace, an alarming alpha detector right on the worker that's sensitive to low doses. Doesn't exist.

If there were one, we'd buy it, we'd implement it.

We'll continue to monitor what's available in the workplace.

We do have alarming instrumentation in the field that provides an indication of if there were an alpha general field that was substantial that could result in a large dose, that would alarm and we would have an indication and we would back people out.

I know this from personal experience because I've seen it in -- at Pickering and I worked there. I was the RP manager in 2010 when we had entries into the boiler room and we had the alpha monitor alarm one day.

We backed everybody out, figured out

what's going on, made sure everybody was safe.

So that gives us confidence that the general area of field is not large. We've got those alarming monitors in the field and we've got reams and reams of data from those instruments, which are called Icams, from our low flow samplers, from our wall-mounted personal air samples.

We've got reams of data that the general alpha field throughout all of this work, all of the refurb work, has not been large. So that is accurate source term information about the actual hazard conditions that workers are exposed to.

So we have characterized the airborne hazards throughout the sequences of work very well and we know those fields are not large.

Now, you can still have a small, localized hazard occur, and that small, localized hazard that's above the general field is what we believe occurred in this case in November where we had these seven positive personal air samplers. But again, those results all proved to be very low.

So the combination of those results were low. We've got 11,000 personal air samplers that were negative that didn't see anything, that they -- the airborne monitors are all telling us that the fields are

all very low.

This is an enormous amount of data that tells us that the airborne hazard is low.

MEMBER DEMETER: So maybe I'll direct this question to CNSC staff much more specifically.

Given the very low concentrations in the sense of micrograms of alpha emitters that are required for significant damage, do you feel that -- what is the parameters for the worst-case scenario potential? Do you feel that there is a potential for a fairly high dose alpha inhalation hazard based on the practices that you see?

Is there an engineering solution to mitigate that worst-case scenario?

I'm worried about the worst-case scenario that you have a localized alpha and you're grinding, and it doesn't take a lot of alpha after being inhaled to cause damage compared to other toxins.

I'm still not convinced that the safety case for the worst-case scenario has been described, and maybe from CNSC Staff maybe they can help me with those parameters.

MR. FRAPPIER: Gerry Frappier, for the record.

So I'll ask Caroline Purvis to come and talk about the details and while she's coming up just to

note.

So there is a radiation protection program that's in place associated with alpha that we are quite content is a very good program, and OPG has explained some aspects of it. We agree 100 percent that the alpha concern is a serious concern because of the toxicity of alpha once -- and the difficulty of getting it out once it's in body. And that's why we focus -- we focus a lot on that.

The -- whether there is or is not a large potential I will leave Caroline to provide our view on that, but the program only works if it's executed properly and if it's executed completely. And so for us and in these 12(2)s, our concern is less about whether the program is there, but more about are they executing it to the extent needed to ensure that there is not going to be any potential for a large alpha dose.

And so that's where these 12(2)s are still working their way through to ensure that we have now and that we put in place to ensure that when Unit 3 comes up or -- and Unit 4 and Unit 1 and at the Bruce and everything else that we actually really understand how to provide the appropriate oversight and ensure that the program is being executed properly.

But with respect to the hazard of alpha itself, perhaps Caroline would like to add to that.

MS PURVIS: Good morning. Caroline Purvis. I'm the Director of the Radiation Protection Division, for the record.

I think I'd just like to reiterate and I think it's been said previously is that the characterization of the radiological hazards is really critical. This essentially provides a database of information for the new clients that are present, their quantities, their spatial distribution and their physical and chemical states.

And this data informs basically how work's to be executed and the radiation protection measures that are necessary, and that includes things such as the instrumentation that's needed, the monitoring, the work planning, the radiological protection of workers including the PPE necessary, dosimetry techniques, and I could go on.

So in the case of alpha contaminants, OPG has demonstrated that they've done historic review, as Mr. Manley described earlier, based on OPEX from other types of activities that have been undertaken in the past.

Quite a few years ago now, all licensees enhanced the radiation protection programs to ensure alpha monitoring and control programs were adequate for not only detecting and monitoring for alpha hazards, but for the protection of workers.

With respect to refurbishment, there are certain activities that have to be done in advance, so characterization may be based on information that's several years old. And so when we look at the execution of work, our expectation is that moving forward and in -- in real time to have validation of what are the expected hazards in the workplace.

And with that in mind, what I would say is that to date the alpha contaminants have been detected by the measures that have been put in place. The past results, for example, are ones that give you a screening or an indication that there could have been an intake.

They worked as intended. I think in the case of the November incident, what we're seeing is the execution of work went beyond the scope of what was intended and what the controls were meant to be in that circumstance.

I think it's hard to provide a really precise answer to your question, Dr. Demeter, in terms of the worst case. What I could provide for you is, for example, the alarming instruments that Mr. Manley described. I believe their set points are at three DAC, so that's three Derived Air Concentration.

So not an insignificant level notwithstanding OPG believes and CNSC Staff is ensuring

that they have adequate real-time information of the hazards in the workplace.

MEMBER DEMETER: So sorry to belabour the point. I just need reassurance that there's a process in place, prospective monitoring, personal protective equipment that would not result in a high dose alpha exposure to a worker.

I haven't heard yes to that question. I've heard a lot of "We're looking into it. We've done the 12(1)s. We've got the DACs, you know, three times". But I need to hear that.

At the end of the day, in the worst-case scenario, someone's grinding and they come across a highly-contaminated area that the PPE or the process would not result in a high dose to the worker. I haven't heard a "yes" to that yet.

MR. MANLEY: Commissioner, are you asking OPG to respond to that question?

MEMBER DEMETER: No, I'm actually asking CNSC first --

MR. MANLEY: Thank you.

MEMBER DEMETER: **--** because -- sorry. I should have -- because that -- if you can't answer "yes" to me, then I'm more worried.

MR. FRAPPIER: Gerry Frappier, for the

record.

So as mentioned by OPG, there is -- I know you said that there wasn't any ability to predict. I think that's maybe a bit too harsh.

I think there is a lot of OPEX on this. There is a lot of ability to say during the performance of this activity we can -- we can expect we're going to encounter alpha or not. And as OPG mentioned, all the ones where there is an expectation that there could be some kind of high occurrence of alpha, I think maybe what has not been mentioned so much is it's quite easy to protect yourself from that in the sense that the alpha exposure, if you have appropriate personal protective equipment, can be in such a way that you would not expect any high dose.

However, that personal protective equipment is burdensome and adds -- there's a lot of considerations here, so it might take more time to do certain things. If you're in the personal protective equipment, that would be applied at a Level 3 sort of hazard.

So there is a decision that has to be made by the -- by OPG with respect to what level of personal protective equipment is appropriate for a given activity.

The hesitation perhaps you're sensing from us is, of course, if that's not done properly, then there

is the potential for an alpha exposure. We would not expect it to be large but, at the same time, as you know, if you're grinding there's different particles that could come up.

So it's very important -- and that's why we're emphasizing it so much. It's very important for the characterization to be both from a planned perspective, from a before the job starts perspective, from an ongoing while the job is happening so that there is a good understanding of what the alpha hazard in the area is.

And OPG has a program that provides for that as long as they executive it that way.

MR. MANLEY: So Commissioner, could I add to that, if you don't mind?

So, Robin Manley, for the record. So, I am confident that we could not have a high dose, if you define high dose as being something like exceeding a legal limit, if that's what you're talking about. Depends what you mean by high dose. If you're talking about one millisievert, you know, it's -- but let me tell you why we are confident.

You know, we are responsible for the radiation protection and protection of our workers. Steve Gregoris as the licence holder for the plant has to have confidence in our program. So that the technical measures

that we have in place to have that confidence include the surveys that I talked earlier, that we actually do have characterization that understands what the hazard conditions are and thousands and thousands of data points that provide an indication that there is not -- and it's more than an indication, provides reams of data that there is not a substantial hazard in the workplace. Plus we put the workers in protective clothing, plus we have rad techs providing monitoring of the workplace, plus we have the teledose cameras and other cameras monitoring the work, plus we have health physics oversight of the job and we have senior management oversight of the workers in the field.

We have the senior health physicist and his team of ALARA specialists who review the radioactive work planning of the jobs and ensure that the jobs are well enough understood that we could not have a large exposure.

Now, is it possible to have small exposures? Absolutely. You know, we knew that we would have some small Alpha exposures that contribute less than 0.01 per cent of our total dose. The vast majority of the dose to our workers is gamma radiation.

As predicted, and we have a lot of experience, many, many years running our programs where we do activities not that dissimilar to refurbishment. We've

replaced pressure tubes before, we've replaced feeders before, we've gone into our boilers where there is Alpha hazards present and we've done grinding on boilers -- and again, I speak from my own personal experience in outages where we've gone in and we've done grinding activities inside the heat transport system where the very same radionuclides are present as they're being encountered in Darlington refurbishment.

And in those activities we stirred up airborne activity, but because we had monitoring in place and because we had protective clothing, we had the controls that I've spoken to we did not have large Alpha exposures. All doses in Alpha range are all like historically less than a millisievert.

And so if you compare that -- and I'm not downplaying the significance of those doses because I do understand the concern about the radio toxicity of Alpha -- but when you compare those doses and the kind of work that's going on, these are the very same kind of work activities as we're doing in refurbishment and we've successfully protected the workers throughout decades of experience of doing maintenance activities similar to what's in refurb.

So, that is why I have confidence. And in addition, I'd like to pass it to Mary Duarte who is going

to speak a little bit about the oversight and the additional protective measures we've added in addition to what we had before, and those measures are added partly as a result of our learning here and partly as a result of the activities of the CNSC staff and yourselves of the Commission have driven us to to make sure that we've added extra barriers.

MS DUARTE: Mary Duarte, for the record. Very good question, Commissioner.

I think that I sense your level of concern. OPG shares concern about a single event, Alpha-related event.

I wouldn't be sitting here if I didn't have full confidence on our Alpha program. And I'm also confident that our workforce is becoming increasingly more proficient in the work that they do.

The workforce that we have in the project at the Unit 2 refurbishment right now has been in the project for over two years. So they have seen more rad work than any RPC in our fleet.

And we also, as I said before, we have invested in training and we have a pretty decent oversight of the work activities. So, we have measures in place to ensure that the work is executed the way it needs to be.

We also -- not everything about Alpha is

reactive. For every specific block of work that we do, we do detailed surveys of the work site, we do collect particulate information at the job sites, so we tend to focus a little bit more and we use that information to produce a rad exposure plan that's reflective of the work that we are about to do.

I would also say that we learn from OPEX during our pre-job briefs, during our ALARA reviews. We incorporate all of these lessons so that we can properly plan our work.

So, having heard what Robin Manley said about the work that we do, plus the OPEX, plus a more proficient workforce, I am confident that we are implementing this program at a very high level. I would say are we perfect? I would suggest to you that we are not perfect, but I would give you the assurance that we have eyes on this work and that we are committed to learn from the industry, we are doing a review of the Alpha program and the implementation, we will carry on that review as well and we are open minded to implement those lessons and to give ourselves the assurance and you, Commissioners, the assurance that we can manage this program effectively without exposing workers to Alpha.

MR. FRAPPIER: Gerry Frappier, for the record. If I could add, because I think the oversight is

important here to add to your question.

So, we have certainly undertaken more oversight along these lines to ensure that the program is implemented as planned, and perhaps it would be worthwhile to hear a bit from one of our site supervisors -- our site inspectors, rather, who is actively doing this right now from our perspective. So, if you don't mind, I'd like to ask Mr. Mathai to provide us with some additional information.

MR. MATHAI: Hi, Andrew Mathai, CNSC site inspector, Darlington, for the record.

Just to reinforce some of the items that have been mentioned here. Coming out of the event that happened in February to November, we followed up on some of the corrective actions taken to ensure the protection of the workers was in place. So, some of the items that were mentioned are the continuous alarming monitors. Those would alarm if hazards reach a level that would require work back-outs, as well as the classification of the hazards of the different areas in the plant, the characterization would inform the classification of those areas.

Coming out of the classification they would perform certain surveys. Our on-site staff verified those surveys are being performed, the summaries are being

performed to ensure that the workers are informed of the hazard level in the area and that the work is being appropriately planned and protected against.

So, those are the types of measures in place that site staff is verifying to ensure that the worker and personnel at site are being protected and that they are able to back out is hazards reach levels that are concerning.

THE PRESIDENT: On the Alpha follow-up? Yes, Mr. Berube?

MEMBER BERUBE: Not to belabour this, but really if I understand that the PPE is being used properly and that people are trained properly that it's going to be effective and there's no doubt my mind about that.

The only thing that I would see as an Alpha problem, because direct inhalation would require that somehow the seal had not worked. So, can you speak to the maintenance that you do on your PPE as well as the training and supervision that is done to ensure that a) this stuff is fit properly, that it's being used properly and that it's being maintained properly because really I think the only issue we have to worry about here really is a seal fit. Would that be correct? Would that be a fair assumption?

MS DUARTE: Mary Duarte, for the record.

So, in terms of the PPE, folks are trained on how to wear a plastic suit properly, staff are trained on how to be fit tested for a negative pressure respirator.

The workers are under direct supervision of a person who has a higher level of qualification, radiation protection coordinator who oversees the use of this PPE. So, the RPC, our radiation protection coordinator would have their eyes on how this PPE is donned and off by that matter because the way you remove the PPE you also need to be careful that you change gloves et cetera and you do not introduce any contamination.

So, through the training and through the oversight we believe that the use of PPE follows our processes, if I can say it like that.

The maintenance of the PPE, we have a certain protocol as well. PPE is inspected before it's used. So, we have those processes in place as well to ensure that the correct PPE is used.

THE PRESIDENT: Anything else on the Alpha event?

So, I do want to thank you for the reassurance that you have given us about the robustness of your program and increased oversight by you and by CNSC staff.

I think one of the reasons why staff had

to issue two 12.2s to OPG I believe was because we didn't think that you shared our urgency and concerns, mostly because the intakes were low.

But I'm really happy to see that it's been given all the attention that we truly believe is required.

The one positive result from the in vitro analysis, what was the result? I don't think I saw that in the report.

MR. SCHWARTZ: Ephraim Schwartz, for the record. So, that is part of the Alpha Cert team that we have going on at OPG. We're collecting the data. As you may be aware, internal dosimetry is very complex, it's not focused on one single result, but it includes all the elements that contribute to that.

Once we have gotten to a position where we're able to share that with the CNSC, dosimetry specialists will share that with the specialists to get their input and challenge.

THE PRESIDENT: Thank you. Okay. Questions on other parts of the status report. Ms Penney?

MEMBER PENNEY: Thanks for that.

A question on the KI pill working group, and thank you for the update that's helpful. So, just in terms of governance, there's an advisory committee. Is there also -- there's going to be a working group, but

that's not been put in place yet, is that my understanding, and the terms of references for the working group, and so what I really want to know is, who are going to be the people on the working group; are they going to be representatives of all the parties involved? Thanks.

MR. FRAPPIER: Gerry Frappier, for the record. So yes, the overall governance is we do have a working group. In one sense it's established, if you like, in the sense that we're having discussions right now but it hasn't formally started until the terms of reference are signed off and we're expecting that to happen over the next few weeks.

That working group has, as far as signatories on the terms of reference is as discussed at the Pickering hearing, is the CNSC, OPG, the Office of the Fire Marshal and Emergency Management of Ontario and the Ministry of Health from Ontario as well.

We are also, with respect to membership of the working group, going to have representatives from the municipalities that are affected by the 50-kilometre zone.

Separately we also have an advisory committee that provides an opportunity for the civil society, if you like, in general to be providing direct input into the operations of the working group. We have -- on that we have the Canadian Environmental Law Association,

we have two school boards that intervened during the Pickering hearings which is the Toronto District School Board and the Toronto Catholic District School Board.

Given there was a lot of reference made to how it has been done at Bruce, we've also included the Municipality of Kincardine, their Chief Administrative Officer is going to be part of that, as well as a representative from Bruce Power who -- again, to make sure we get the view from another licensee who has done things a little bit differently.

And finally, we also on the advisory committee have an academic representative from McMaster University to provide a little bit more of that, say, theoretical approach to emergency management.

So, those two groups are in the process of being set up I would say and at our next update I should be able to provide you with a bit more information on that.

MEMBER PENNEY: Thank you. So, in the update it refers to a CNSC advisory committee, so that advisory committee involves all these external parties, so it's not internal to CNSC, it's got other parties involved?

MR. FRAPPIER: That is correct. And so it's fundamentally for the other parties to be able to input in in an ongoing manner and the CNSC title is more just because it's come out of the Pickering hearing that

it's sort of got that, but there will be -- the Chair will be a CNSC employee, but the rest is not.

MEMBER PENNEY: Well, I'm pleased to see external parties involved in the advisory committee. So, thank you for that.

THE PRESIDENT: Thank you. Mr. Berube? Any other questions?

Dr. Lacroix?

MEMBER LACROIX: Yes, I do have a question for OPG concerning the refurbishment project. From what I understand, you're installing new feeder tubes connected to an old contaminated header. What is the reason for not changing the header itself?

MR. MANLEY: Robin Manley, for the record. So, the brief reason for that, and I do have members of the refurbishment team in the background there in case I get this slightly wrong, but essentially the header remains fit for service, fit for purpose throughout the projected extension of another 30 years of operating life. It is not subject to the same kind of degradation mechanisms as the feeder pipe and, therefore, it is perfectly fit for service and, therefore, no reason to replace it which would just increase cost and additional contaminated waste if we did replace it.

MEMBER LACROIX: I know that I'm a little

bit naive, but to me it's just a piece of pipe.

THE PRESIDENT: Maybe we should save it for the refurbishment discussion.

MEMBER LACROIX: Okay.

THE PRESIDENT: On the status report, anyone else?

I had a couple of quick questions on the two Bruce incidents or accidents. And I know we got preliminary updates on that. Maybe I'll wait for the Bruce representative to come up.

On the electric shock, can you share with us what the Ministry of Labour's findings were on that?

MR. BURTON: Maury Burton, for the record. At this point in time I actually don't have the Ministry of Labour's findings, so I can't really sure that with you at this point in time. I can take any other questions that you may have though.

THE PRESIDENT: So, not on that one, but on the other one, the slipping one where the employee fractured their ankle, so was this a lost injury and, if so, how many days severity and how is the worker doing?

MR. BURTON: Maury Burton, for the record. In that case it was a lost time incident. The worker is not back at work yet, there were some complications. The worker needed surgery and there were some complications

during the surgery, so the worker in question does have a medical appointment next week with their doctor and we're expecting to get a return to work time after that appointment.

THE PRESIDENT: Thank you. Then maybe just for staff, in the status report because it now says it was medical attention just make that a bit more complete for future reporting.

Any other questions on the status report? If not -- oh, okay, Mr. Berube.

MEMBER BERUBE: While we've got Bruce up here, just a quick update on the Class 4 transformer that unfortunately went amok. Any idea when you're going to have another one back in service?

MR. BURTON: Maury Burton, for the record. We have a transformer on order. These are long lead items, so we're expecting some time late this year or early next year for delivery and then it will take approximately four weeks to install. So, it's going to take some time. Fortunately for us, we do have three other system service transformers that can provide load to Unit 8, so we do have a lot of redundancy there.

THE PRESIDENT: Thank you. We'll take a 15-minute break and resume at 10:45.

Thank you.

--- Upon recessing at 10:31 a.m. /
Suspension à 10 h 31
--- Upon resuming at 10:46 a.m. /
Reprise à 10 h 46

THE PRESIDENT: The next item on the agenda is an update on the Darlington Unit 2 process for the return to service, as outlined in CMD 19-M6.1

I will turn the floor to Ontario Power Generation for their presentation.

Mr. Gregoris, the floor is yours.

CMD 19-M6.1

Oral presentation by Ontario Power Generation

MR. GREGORIS: Good morning, President Velshi and Commissioners. My name is Steve Gregoris, I'm the Senior Vice President of the Darlington Nuclear Generating Station, for the record.

I'm here today with members of the refurbishment team to provide a presentation on the Darlington Station and in particular to provide a status on the refurbishment of Unit 2.

In October of 2016 we shut down Unit 2 to

start refurbishment of the first reactor. At the time I was the Director of Operations and Maintenance at Darlington. Two weeks after the shutdown I left for a new work assignment. Two years later I've returned to Darlington as the Senior Vice President and I have to say that I'm quite happy but I'm not surprised to see how the years of planning have paid off in the progress we are currently seeing on Unit 2 today.

We are here to share that success with you today, but first we'll start by giving a brief overview of the Darlington Station. We will then talk about how we organized ourselves to ensure continued safe operation of Units 1, 3 and 4 as we refurbish Unit 2 safely and with quality. We will then go into the details of the refurbishment project, including current status of the project. We will end the presentation with a look forward and speak to how we set ourselves up for a safe and successful restart of Unit 2.

Darlington Unit 2 went into service in 1989. The last unit, Unit 4, went into operation in 1993. The station has been providing safe, clean, reliable power for 30 years. The four units at Darlington provide 20 percent of Ontario's electrical demand, which is enough power for 2 million homes.

The Darlington Station is recognized as a

top-performing nuclear power plant in the world, specifically in the areas of operational safety, equipment reliability and operating performance. At Darlington we are fortunate to have the trust and confidence of our local community. They support our ongoing operations and the refurbishment of our units, and we are committed to continue to further strengthen this relationship going forward.

At Darlington and all of OPG safety is our first priority. It starts with nuclear safety, those unique behaviours and high standards that are required to operate, maintain and refurbish a nuclear power plant. It includes conventional safety because of the heavy industrial work we perform. Our focus on radiation safety is to ensure dose to our workers is as low as reasonably achievable.

Through the 30 years of operation at Darlington we have committed to minimize our impacts on the environment and we continue to plan and execute our work with protection of the environment front of mind. Public safety is paramount. Our priority is not only to ensure the safety of our workers but of the public as well.

Darlington is committed to improve the well-being of the communities that host its operations. We believe this is essential to being a good corporate citizen

and neighbour. We do this in part through community partnerships in the areas of environment, education, community programs and Indigenous initiatives. We also do this as active community members, because we just don't work in the local community, we live there too.

Through these relationships and OPG's commitment to and track record of operating in a safe, open and environmentally responsible manner, we believe OPG has gained the trust and confidence of the local community and we need to continue to earn that trust each and every day.

At OPG we are committed to operating Darlington safely for another 30 years. As part of that commitment we are making significant equipment investments in the station because a reliable station is a safe station. As part of that investment we are refurbishing each of the units.

It's important to note that refurbishment focuses on the reactor components, along with other key plant systems and safety improvements, but it does not cover all of the station equipment. For that reason we have a lifecycle management plan that goes out 30 years and prescribes when equipment needs to be worked on or replaced to ensure reliable operations.

Refurbishment, the lifecycle management plan, along with a well-developed operating and maintenance

plan will ensure reliable, safe operation into the future.

Before I hand it over to Dietmar Reiner and Gary Rose for details on the refurbishment project, I thought I'd outline how we are organized to ensure clear line of sight for station operations and the refurbishment project.

I am the licence holder for the Darlington Station and both normal station operations and the refurbishment project are executed under my licence.

For station operations we have an operations, maintenance, work management and engineering organization. We also have an individual, the Director of Operations and Maintenance, or DOM, who is responsible to ensure all station operations-related activities are executed within our licence.

For refurbishment we have a separate but integrated operations, maintenance, work management and engineering organization. We also have a Director of Operations and Maintenance who has delegated authority from the station DOM to ensure that all refurbishment activities are executed within the operating licence.

In organizing ourselves this way we ensure clear roles, responsibilities and accountabilities to support safe operation of Units 1, 3 and 4, and safe execution of the refurbishment of Unit 2.

I will now turn it over to Dietmar for details on the project.

MR. REINER: Thank you, Steve.

Good morning, President Velshi and Commissioners. For the record, I'm Dietmar Reiner, Senior Vice President of OPG Enterprise Projects, and I have overall accountability for the execution of the Darlington Refurbishment Project.

In October 2016, as Steve has indicated, after many years of planning and preparation, our team of industry experts, our highly trained professionals and skilled operations and tradespeople successfully took the first of four Darlington units offline, commencing a 10-year long undertaking to refurbish the four Darlington units. Since that time we've safely worked more than 13 million hours without a lost time accident and the Darlington Refurbishment Project remains on schedule and on budget, and that's critically important for us.

Each unit will undergo a refurbishment taking approximately 35 to 40 months. Unit 2, the current unit being refurbished, is now about 75 percent complete. The first restart control hold point, which we'll talk a bit more about shortly, has been achieved and 25 of 58 systems have already been returned back to service. Our plan is to complete Unit 2 before we start the

refurbishment of the next unit, Unit 3. The refurbishment outages then overlap and we'll have two units undergoing refurbishment at the same time.

This is a $12.8 billion investment that will extend the continued operations of Darlington out to at least 2055. It's also one of Canada's largest clean energy projects and the greenhouse gas emissions that we'll avoid by the continued operation of Darlington is equivalent to about 2 million cars annually.

In addition to playing a significant role in Ontario's clean energy future and helping Canada meets its climate objectives, the Darlington refurbishment will also have a significant long-term financial benefit, with 96 cents of every dollar from the project being spent right here in Ontario.

At the core of the project is the rebuilding of the reactor by replacing the major reactor components as well as the upgrade of key plant systems, but in addition to that, we're also making substantial safety and infrastructure investments, which I'll touch on in a few minutes.

Planning and preparing for the refurbishment project was a decade-long endeavour. The project team brought a wealth of experience and gathered significant amounts of industry experience on how to best

plan and execute major construction projects, including experience from our own major projects.

We're applying a phased project management approach broken down into three key phases.

The initiation phase was a three-year effort that began back in 2007 where we conducted technical assessments and condition assessments of plant structures and components to help us define project scope.

And maybe I'll just attempt here to address the question that was raised about why not replace the header pipe. It's just a simple piece of pipe.

When you refurbish a plant like Darlington, there are areas where the work is actually far more complex than constructing new because you're having to work around existing structures, existing interferences. In the case of Darlington, all of the equipment that needs to be replaced, all the components that need to be replaced in the reactor and inside the reactor building have to go through an equipment airlock, have to go in through the equipment airlock, the old components have to come out, and there are significant interference and spatial restrictions. As well, when you remove components, there is a large of number of restrictions that you have to deal with. So the condition assessments that we conduct become critically important for that reason, so we understand

precisely what components need to be replaced and what components can stay behind if the condition allows them to safely operate to the end of second life.

A simply analogy I would give you is when you're renovating your bathroom and you want to change a drain at the bottom of your bathtub. When the house is first built, it's easy to do, it's a piece of plastic pipe, but when you're doing it in a renovation, to replace that pipe becomes a complex undertaking. So you want to be sure that it's fit for service.

An economic feasibility assessment was also conducted to ensure that the investment made good business sense for OPG and also for the electricity ratepayers of Ontario. And this initiation phase also included the development of contracting strategies as well as approvals by our own Board of Directors and by the provincial government to proceed with the project.

The definition phase involved regulatory approvals, including an environmental assessment and Integrated Implementation Plan which lists the regulatory commitments required to support long-term safe operation of Darlington. This was also the time in the project when significant infrastructure upgrades were made around the Darlington site. Construction contracts were awarded and a detailed cost estimate and schedule were issued.

This was also the time when we completed construction of a full-scale mockup of a Darlington reactor vault to assist in the training of personnel and the development and testing of tools and workplans. This helped us build a high confidence schedule. Our mockup facility has also proven to be instrumental when it comes to worker safety. The thousands of hours of training have helped our workers gain familiarity and expertise with radiological practices, with work tasks and tooling before the actual work began, enabling them to learn on the mockup before they executed the work in the field on a reactor.

The execution phase is when the units are taken offline, which involves the job of safely isolating the unit being refurbished from the operating station, taking the systems apart, rebuilding the equipment and then safely returning the unit back to service. The years of planning and extensive inspections that we undertook and the worldwide benchmarking and lessons learned that we've applied, coupled with our own operational and project experience, are helping us deliver the project safely, to the quality that's required in our environment, and on budget and on schedule.

While the focus of the refurbishment project is largely on the reactor and other station systems, a large effort has also been underway to make

substantial safety and site infrastructure improvements.

The slide that you see here shows where these improvements have been made.

In terms of safety enhancements, shown here with the pink bubbles, a third emergency power generator to complement the existing emergency power generators has been constructed and placed in service; a new containment filtered venting system has been constructed; a powerhouse steam venting system has been installed; a shield tank overpressure protection system has been installed on three of the operating units and is now coming to a successful conclusion on Unit 2; and enhancements to the emergency service water are being made.

We've also made a number of site infrastructure improvements, including new roads, water and sewer systems; site electrical distribution system; refurbished office facilities; expanded vehicle screening facility; a new auxiliary heating steam facility; and a new used fuel dry storage building. These are shown in the blue bubbles on that graphic.

And shown with the yellow bubbles are infrastructure investments that we've made to support the execution of the Darlington Refurbishment Project. These include the Darlington Energy Complex which houses our project management staff; the Mockup Training Facility,

office and shop facilities to support the retube and feeder replacement work; an onsite project office with parking lot, change rooms, lunch room and security access for the refurbishment workers; a first-ever retube waste processing facility to reduce our environmental footprint and that was successfully used to process and volume-reduce reactor components removed from Unit 2; a retube waste storage building; and a heavy water management facility that is now substantially complete and will be available this summer to store the heavy water from future refurbishment units as well as help us manage our ongoing heavy water needs.

You can see from the number of projects we've executed, enhanced safety and improved the site infrastructure that this has been a very significant undertaking.

And with that, I will now turn it over to Mr. Gary Rose to give you an overview of the project scope and to specifically tell you where we're at in execution of the Unit 2 refurbishment.

MR. ROSE: Good morning. Thank you. For the record, I'm Gary Rose, I'm the Deputy Site Vice President for the Unit 2 refurbishment.

I will spend some time talking about a review of the major components being replaced or refurbished on Unit 2; I'll provide an update on our

progress with respect to the Integrated Implementation Plan; I'll talk about our current project performance against our four pillars of safety, quality, schedule and cost; and I'll also provide an overall status update on what we have completed thus far and what's left to be done.

So starting off with scope, defuelling and fuel-handling reliability.

Defuelling was one of the first series executed when we first took Unit 2 offline, but investment in the equipment reliability and planning actually started many years in advance. This effort was focused on safely removing all 6,240 fuel bundles from the unit. Investments were made in equipment reliability to safely de-core the reactor and ensure no impact on the operating units. This investment proved to be very successful as the fuelling of the reactor occurred ahead of plan and event-free. Upon completion of defuelling, all of the reactor bridge and carriage equipment were removed from Unit 2 and is currently undergoing refurbishment prior to reinstallation later this year. Power track cables are also being replaced and the irradiated fuel bay heat exchangers were replaced to increase reliability and safety of the equipment.

I'll now move on to the retube and feeder replacement scope.

The retube and feeder replacement is really at the heart of the refurbishment that ultimately allows us to extend the life of the asset for an additional 30 years. This is certainly one of the most complex and challenging efforts that we will undertake on this project and it includes the removal and replacement of all 480 calandria tubes and fuel channel assemblies, including pressure tubes and fittings and supporting hardware and associated parts. Additionally, all 960 feeder pipes are all being replaced in sections, upper feeders, lower feeders, and for some feeders that are very long and cannot be loaded into the vault in one piece we have a middle feeder section.

In order to prepare for this series, a significant investment was required in tooling to remove and process reactor components and to then, in turn, reinstall those components. A retube waste processing building was constructed to house the waste processing activities and a retube waste storage building was licensed to store the processed waste.

Additionally, in order to prepare for the use of these tools we invested in a full-scale reactor mockup, as Dietmar alluded to earlier, to plan for the project but also to test the tools and practise and train on these tools before any work is done in the reactor

itself.

I'll now move on to steam generators.

Each reactor at Darlington has four steam generators measuring 22 metres in height and containing over 4,500 U-shaped tubes. OPG, due to good chemistry control, does not need to replace its steam generators. However, OPG will perform a primary side and secondary side cleaning, a form of water lancing, on all of its steam generators. This work has been completed on Unit 2 and over 5,000 kilograms of magnetite was removed and stored, and greater than 16,000 tubes were cleaned and inspected, and no tubes required replacement. This confirms that our initial work through the condition assessments and the component inspections that steam generators can safely operate for another 30 years. Additionally, we installed access ports on each of the steam generators in order to do further inspections or additional cleaning as required in support of extended station operations.

Turbine generators. Each Darlington reactor has a set of large industrial turbines consisting of a high-pressure turbine and three low-pressure turbines located in the turbine floor, the non-nuclear side of that station, which is more than half a kilometre long. The turbine sets' auxiliaries and controls are highly specialized equipment as part of the integrated systems for

Darlington. All of the turbines were disassembled, inspected and reassembled for the first time since Darlington was initially constructed. Work, condition assessments and inspections have shown the systems can safely operate for another 30 years and do not need to be replaced.

While not done on Unit 2 at this time, the turbovisory control system will be upgraded on each unit, starting with Unit 3. Unit 2's control system will be replaced at a planned outage in the 2022-2023 timeframe. Also, new stators will also be installed for Units 3 and 4.

I'll now shift to balance of plant.

Balance of plant includes in essence all of the other scope that we are doing in the refurbishment that isn't included in the four major scope bundles that I've already spoken to. It includes work on both the nuclear side and the conventional systems and, as you see by the slide, there's a long list of items. I'll just speak to a couple of these.

We have a new auxiliary shutdown cooling system that is a significant modification that is currently underway in Unit 2. It will be complete by quarter 2 of 2019.

We have replaced shutdown cooling heat exchangers. We replaced adjuster rods and in-core flux

detectors and a number of other low-pressure service water, fire protection, electrical type systems as well as the primary heat transport pump motors.

Also, while the unit is in its refurbishment state, ongoing maintenance of systems which are not being refurbished are also being laid up and will be maintained through the refurbishment period.

I'll now shift to the status of the Integrated Implementation Plan.

So Licence Condition 15.3 requires OPG to implement the Integrated Implementation Plan, or IIP, in accordance with our commitments. These are commitment to make process and/or plant modifications for extended life based on the results of the Environmental Assessment, the Integrated Safety Review and the Global Assessment Report. These commitments were made at the time of licence renewal in 2015 and include the safety improvement projects that Mr. Reiner spoke to a bit earlier. Many of these IIPs provide significant safety benefits for future operation and safety improvements for defence in depth such as for beyond design basis excellence.

Overall, there are 162 IIPs, representing 627 IIP tasks; 72 of these IIPs are linked to the restart of Unit 2. Progress of these IIPs and all others are routinely reported to the CNSC and OPG has successfully

completed all commitments each year since 2015, including all requirements in 2018. In 2018 we also advanced the completion of a number of the 2019 commitments: 38 IIP commitments are complete as of January 2019. We expect to complete all IIPs as planned and well ahead of the completion of the refurbishment activities.

I'd like to now shift to providing you an update on Unit 2's project performance. I will speak to both industrial and radiological safety in the next slides.

Overall, our quality performance is good, including our vendors. We have a large quality organization and they are proactively involved in overseeing the work, witnessing results per inspection and test plans, and ensuring a comprehensive documentation file set is prepared for each work activity.

From a schedule perspective, the project is now over 75 percent complete. We're now well past year 2 of the three-year-plus effort to rebuild Unit 2 and are in the final stages of installing reactor components. Over 85 per cent of our bulk work is now behind us, giving us a clear view of managing the safe return to service of Unit 2 by beginning the process of safely returning systems to service.

To date, a total of 25 of our 58 systems have now been completed and returned to station operations.

We're on track to place Unit 2 in service ahead of our public commitment, which is February 27th, 2020. The project also remains on and is forecast to be completed within the approved budget.

So now I'll talk about industrial or conventional safety.

Since the refurbishment project started, there have been no lost-time injuries on the project. This amounts to 10 years and over 13 million hours worked without a lost-time accident. That is something that we are very proud of on this project. The refurbishment project's total recordable injury frequency, TRIF, at the end of 2018 was 0.39. This is approximately 10 times better than the Ontario construction industry. Just as a notation here, in 2018, the Ontario construction industry average TRIF was 4.53.

Although we are happy with the overall industrial safety performance, we're not satisfied. While our TRIF is low, we're still conscious of the fact that we continue to have low-level events, including some medically treated events. We remain vigilant and focused on safety even when our performance is good. We're committed to continue to strive to the goal of zero injuries in our day-to-day conversations within OPG and with our broader vendor partners.

We strive for this in a number of ways. Firstly, I've talked about the full-scale mock-up that was built prior to the start of refurbishment. This allows our workers, our contractors to fully practise their work before they actually step inside the reactor vault. This is where we want them to make mistakes and errors and perfect the methods for how they're going to do the work in the vault. This gives us a great opportunity to ensure safety is embedded within the work activities that they're going to perform.

With a large number of contract workers on the project, individuals who are new to nuclear are identified and receive additional training and support to ensure that they have the tools to work in the environment. The New to Nuclear program ensures the workers are clearly identified with an NTN sticker placed on their hardhat and given additional guidance by their immediate supervisors for a period of no less than six months.

All work, whether completed by OPG or contractors, requires the use of a safe work plan. Safe work plans outline the steps of the work, the hazards associated with the controls to be put in place to mitigate those hazards. These safe work plans are developed by personnel who are familiar with tasks being completed, usually trade-specific tasks, and then revised and accepted

by additional third parties, engineering, safety, radiation protection, et cetera.

We are continuing to train and develop our supervisors to fully understand and respect the nuclear safety culture that we are developing at OPG. We also integrate nuclear safety culture communications in our daily shop floor talks, which get out to every worker in the field. And recently WANO, the World Association of Nuclear Operators, was on site doing a restart readiness review. And they identified the focus on nuclear safety culture with our vendors to be a strength. So we're very proud of that.

The project runs annual nuclear safety culture assessments and includes our vendors in this review, ultimately to identify areas where we can improve our collective performance.

I'll briefly talk about radiological safety. I think we've covered this already today.

Nuclear refurbishment established an aggressive target for collective dose for Unit 2. This was based on extensive OPEX and lessons learned from previous CANDU refurbishments. And currently we are projected to perform within five per cent of that aggressive target.

Reflecting on that, through the OPEX and the understanding of the work, we had a good target. We

set an aggressive target, and we're delivering the project within a tight range of that target.

The five per cent growth in our results against that target are largely due to our feeder work program going longer than it was initially planned. So it's dose times for the length of time where we have workers working in the feeder cabinets for a longer period of time, and thus are collecting additional dose beyond what was originally planned.

I won't spend any time talking about the detailed work program that radiation protection has put in place by OPG by our Radiation Protection Department. That was already covered earlier this morning, but we are very confident as the project team that with the support of the Radiation Protection Department, the continuous improvement programs that they have in place, that our work and our workers remain safe.

Also at OPG we work hard to minimize our environmental footprint to safely process and store activated reactor components. A specialized waste processing facility was built and constructed. Over 4,000 flask movements and 24,000 individual lists of activated reactor material were undertaken safely for Unit 2. Pressure tubes and calandria tubes were processed and volume reduced. In the case of calandria tubes, volume for

storage was reduced by a factor of five.

So I'll now shift to the last part of my presentation, which is reviewing where we are on the schedule, the overall status of the work activities within the project. And I'll start off by saying that we divided the project into four phases, a lead-in phase, a removal phase, an installation phase, and a lead-out phase. And I'll go through this in a little bit of detail.

Overall, our plan for Unit 2 is 40 months, from October 2016 to February 2020. The first phase of the project began in October 2016 when we safely shut down the reactor and removed it from commercial operation. This is also referred to as the lead-in phase. The reactor was shut down. Fuel was safely removed, and physical barriers put in place to safely isolate the refurbishment unit, Unit 2, from the operating units. A containment pressure test was conducted to assure ourselves that we effectively isolated Unit 2 from the operating units.

The next segment is the component removal phase. And because of the volume of work, it was divided. We divided it into two segments. The first segment involved opening the airlocks, a critical step to allow us to get large pieces of equipment and staff safely in and out of the vault with these. The fuel-handling equipment was removed and a specifically designated retubed tooling

platform was installed. This is a state-of-the-art work table allowing tools and workers to access the reactor face with care and precision.

With the work platform in place, we then went about the work of removing all 960 feeders. That involved the careful cutting into smaller, more manageable lengths, storing in low-level storage bins, and safely transporting off site. This was a 24/7 operation. This work took a significant coordinated effort between radiological protection, security, and our radioactive transportation group not to impact the schedule.

The next step involved the cutting and severing of pressure tubes and bellows.

--- Off record discussion / Discussion officieuse

The next phase of the removal stage was the removal of end fittings, the removal of pressure tubes, and the removal of calandria tubes. Once the removal phase was complete, the calandria vessel was carefully inspected and was found to be in pristine condition.

We then shifted to the third phase, which involves the installation of reactor components. This includes calandria tubes, pressure tubes, end fittings and associated hardware, and the completion of installing all of the remaining feeders.

All 480 calandria tubes have been

installed. We have now installed about 40 per cent of the fuel channels. The fuel channel assemblies are partially assembled in Pickering in a clean room, where they are measured, inspected, and shipped to site for insertion on the east side of the reactor prior to installing the end fitting on the west side.

In parallel to this, was have installed 556 of the 960 upper feeder pipes and have commenced the installation of the 248 middle feeders. We actually commenced this phase last week, and we currently have six middle feeders installed of the 248.

Once fuel channels are installed -- our predicted date for that is early April -- we will commence installation of the lower feeders, including cantilevers, instrumentation lines, and feeder cabinets.

I must note that this walk-through is focused on the critical path of the project, mainly the reactor core components. But in parallel to this critical path is the installation work of the turbine generator project, which is in the final stages of execution, as well as the numerous balance of plant and other major systems I spoke to earlier in this presentation. They're currently 85 per cent complete.

I'll now speak to the final phase, which is the lead-out phase.

Once the installation of the core reactor components -- including calandria tubes, fuel channels, and feeders -- is complete, we will load fuel into the unit. We will restore the vault, which includes the removal of the retube tooling platform and reinstallation of fuel-handling reactor bridge and carriage assembly. We'll then remove the bulkhead, restoring containment.

The final phase is confirm the reactor has been made whole again, return systems to service, and begin the process through a number of steps and checks to begin the gradual return to full power operation.

Again, while all mega projects have day-to-day challenges, within our nuclear safety culture, we record daily events considered low-level reporting in order to trend and understand and proactively resolve issues. When you step back and look at the overall picture of where we are on this project, we're in a good spot to safely deliver, safely and with quality, and return this unit to service ahead of our public commitment date of February 27th, 2020. We are currently targeting to be complete Unit 2 at the end of 2019.

Lastly, a significant amount of thought and effort went into the planning and preparation for refurbishment, such as the use of the retube control centre, where the tools are remotely operated and the

workers on the reactor face are monitored, or the full-scale mock-up to train workers before they set foot into the reactor.

We have developed and engineered over 400 specialized tools, many of which are automated and operated remotely, to perform the work with precision and quality and enhance the safety of workers.

We're also working on deploying virtual reality training for workers, many of which are new to nuclear, to simulate and create a more realistic work environment before the actual work is conducted.

Lastly, we are learning many lessons on Unit 2 on how to work safer, improve productivity, enhance performance, and become more efficient. These lessons are occurring in real time on Unit 2 and are being detailed, tracked, and captured and are already being applied to the planning of Unit 3 to ensure we do an even better job for each subsequent unit refurbishment.

These lessons are also being shared with Bruce Power, and they're sharing their lessons with us, so that together we can better integrate and collaborate on successful refurbishments.

I'll now turn the presentation back to Mr. Gregoris, who will discuss our journey as we return Unit 2 to service.

MR. GREGORIS: Steve Gregoris, for the record.

I mentioned earlier how we were organized to ensure clear line of sight for both station operations and the refurbishment project. But it takes more than just being well organized. It takes strong integration and collaboration.

In front of you is the Journey of Excellence or JOE poster for the Darlington station. It's a communication tool we use with our station staff. It shows the journey our station is going to take over the next three years, and the milestones we look to achieve over that time.

In the centre of the poster are the major changes of state for Unit 2 as we move through start-up of that unit. These milestones are a priority for all of us at Darlington, and together the station organization and the refurbishment organization will work as one Darlington team to restart Unit 2 safely and with quality while safely operating Units 1, 3, and 4.

The CNSC has four regulatory hold points as part of Unit 2 restart. They are shown in red on the overhead and include fuel load, removal of the guaranteed shutdown state, reactor power grid on the one per cent full power, and reactor power grid on 35 per cent full power.

Integrated with these four regulatory hold points, OPG has an additional five for a total of nine restart control hold points. A rigorous process is applied to each hold point to ensure all requirements are met prior to moving past these pre-defined points of unit restart.

To ensure CNSC staff are provided with all required information sufficiently early to support a timely decision to remove a regulatory hold point, OPG and CNSC staff have documented a protocol for Unit 2 return to service. It provides a detailed breakdown of the deliverables required and it also defines an escalation process should issues arise so that decisions are made outside of critical path.

The Darlington station has been providing safe, clean, reliable power to the province of Ontario for 30 years. Unit 2 refurbishment is nearing completion. This work has been done safely, with quality, is on time and on budget. Under a single site licence, we've organized ourselves to ensure clear line of sight for the continued safe operation of Units 1, 3, and 4 while executing the Unit 2 refurbishment safely and with quality.

Refurbishment, the life cycle management plan, and a well-developed operating and maintenance program will further improve equipment reliability and plant safety margins. This in turn will ensure continued

safe, clean, reliable power for the province of Ontario for the next 30 years.

President Velshi, Commissioners, we thank you for the opportunity to present to you today.

THE PRESIDENT: Thank you very much for that.

We'll now turn the floor to CNSC staff for their presentation as outlined in CMD 19-M6.

Mr. Frappier, over to you.

CMD 19-M6

Oral presentation by CNSC staff

MR. FRAPPIER: Thank you very much. And I think that it's important as part of this update on refurbishment that we understand and the Commission and the public understand the actual refurbishment work. And OPG is best-placed to explain that, as they have in the previous presentation.

What we'd like to do in our presentation is make it clear with respect to the CNSC's role in the return to service of Unit 2, and in particular the process that we will be using for the removal of the regulatory hold points that were just mentioned that are part of the licence. And for that, I would like to turn this

presentation over to Nathalie Riendeau.

MS RIENDEAU: Merci. Bonjour, Madame la Présidente, Members of the Commission. Mon nom est Nathalie Riendeau. I am the director of the Darlington Regulatory Program Division.

I am joined here today by a team of CNSC site inspectors and specialists, who oversee the refurbishment activities at Darlington.

The CNSC staff presentation today will provide an overview of the CNSC regulatory oversight activities for the Darlington refurbishment project, which began with the shutdown of Unit 2 for refurbishment in October 2016. Our presentation will also describe the CNSC process for the return to service of Unit 2 and the removal of regulatory hold points.

CNSC staff have accumulated years of experience in overseeing refurbishment projects at Pickering, Bruce, and Point Lepreau. The experience from these previous projects have been applied to the regulatory oversight of the Darlington refurbishment project.

The main objectives of the CNSC regulatory oversight during refurbishment are to first confirm that the activities are conducted safely and in compliance with regulatory requirements. It's also to confirm that the integrated implementation plan commitments are being indeed

implemented, and to confirm that the plant and its personnel are ready to return to service following refurbishment.

In December 2015, the Commission renewed the Darlington operating licence for a period of 10 years. With the current licence, the Commission authorizes OPG to undertake the refurbishment and life extension of all four Darlington units and requires OPG to implement the improvements identified during the environmental assessment for the Darlington Refurbishment and the integrated safety review. These improvements are detailed in the integrated implementation plan or IIP.

At the time of licence renewal, the Commission delegated the authority to remove regulatory hold points for the return to service of each unit undergoing refurbishment to the executive vice-president and chief regulatory operations officer. The Commission previously granted similar delegation of authority for the Bruce Power Units 1 and 2 and the Point Lepreau refurbishment projects.

In order to provide assurance that return to service activities are performed in a manner that does not compromise safety, the Power Reactor Operating Licence includes conditions that the licensee must satisfy as part of the return to service program. Licence condition 15.2

provides assurance that all prerequisites and restart activities have been identified, properly planned, and executed. Licence condition 15.3 requires OPG to complete the improvements identified in the IIP. And finally, licence condition 15.4 requires OPG to obtain approval of the executive vice-president and chief regulatory operations officer to pass the established regulatory hold points.

The regulatory hold points provide assurance that important milestones are met and verified by the CNSC prior to returning a unit to commercial operation. CNSC staff have identified four regulatory hold points for the return to service of each unit undergoing refurbishment at Darlington. The hold points are aligned with the return to service and commissioning activities.

So hold point number 1 focuses on ensuring that those systems required to ensure safety with fuel loaded in the reactor have been adequately commissioned. This phase must be successfully completed prior to loading the fuel in the reactor.

Hold point 2 focuses on ensuring that the fuel is safely loaded and confirming that the reactor is in a suitable condition to be started up and that all prerequisites for permitting the reactor to go critical have been met. This phase must be successfully completed

prior to removal of the guaranteed shutdown state.

Hold point 3 focuses on confirming reactor behaviour at the state of initial criticality and subsequent low power tests.

And hold point 4 focuses on demonstrating reactor and system behaviour at higher power levels.

Compliance verification criteria for the removal of each regulatory hold point are included in the Darlington *Licence Conditions Handbook*.

One of the main objectives of the CNSC regulatory oversight is to confirm that the refurbishment project is conducted safely and meeting regulatory requirements. To this end, CNSC staff have developed a compliance plan specific to the refurbishment of each Darlington unit. Compliance activities consist of inspection, field walk-downs, observation, review of licensee records and documentation.

The CNSC compliance activities are planned and risk-informed. The compliance plan incorporates experience and lessons learned from previous refurbishment projects and also takes into account the licensee's return to service program.

Our plan, our compliance plan, followed the project execution phases described by Mr. Gary Rose earlier, the lead-in phase, the component removal phase,

the installation phase and the lead-out phase. CNSC Staff have completed compliance activity for the first two phases of refurbishment and compliance activity for the third phases -- phase, sorry, are in progress.

The fourth phase is scheduled for later this year in 2019 and has planned activity to verify fuel load and start-up of Unit 2.

A team of on-site CNSC inspectors are present throughout the project to verify safety and compliance with regulatory requirements. In addition, technical specialists in various disciplines monitor the project execution to ensure regulatory requirements and licence condition continue to be met.

CNSC Staff have completed 23 Type 2 inspections since 2016 for the Unit 2 refurbishment project. These inspections cover multiple safety and control areas.

As show in the chart, minor adjustment of the inspection schedule were made in 2017 and 2018. This was in response to the licensee's schedule and performance.

Today, the majority of CNSC inspections have demonstrated that OPG is meeting regulatory requirement. However, CNSC Staff inspection have identified areas of improvement related to the implementation of the radiation protection program during

refurbishment.

Action plans to address these improvement areas have been established and are being monitored closely by CNSC Staff. CNSC Staff continue to verify safety and compliance with regulatory requirements.

The compliance plan for Unit 3 is currently being revised, taking into account operating experience and lessons learned from the unit to refurbishment project.

In addition to the CNSC compliance plan for the refurbishment of Darlington Unit 2, as it was indicated by Mr. Rose, CNSC Staff and OPG have put in place an administrative protocol. The protocol clarifies the requirements and CNSC Staff expectation for the Unit 2 refurbishment and return to service.

The protocol also monitors the progress of return to service activities, deliverables and commitment.

As noted earlier in the presentation, two objectives of the CNSC regulatory oversight are to confirm that the improvements committed by OPG in the IIP are implemented and that the plant and personnel are available and ready for return to commercial operation.

Overall, the integrated implementation plan consists of 627 IIP commitments that encompass all four reactor units at Darlington.

As shown on this slide, of those 627 commitments, OPG has completed 315. As highlighted in OPG presentation, major safety improvements completed to date include shell take over pressure modification in all four units, containment filter venting system and the installation of the emergency power generator 3.

CNSC Staff are satisfied with the progress to date on the IIP.

Of the total 627 IIP commitments, 72 are specifically associated with Unit 2 restart. To date, OPG has completed 38 of those commitments. The majority of the remaining commitments are associated with the replacement and testing of major components such as fuel channel, calandria tubes and fittings.

As refurbishment near completion, the unit will be commissioned and returned to service. As indicated earlier, return to service is contingent on the removal of the four regulatory hold points.

For each regulatory hold point, OPG is required to demonstrate that the people and the plant are ready for return to service by demonstrating that adequate number of trained and qualified staff are available, that all required training has been delivered to safely execute the plant activities and start-up of the unit, that procedures have been prepared, reviewed and validated, and

that system, structure and components required for the removal of each regulatory hold point are confirmed to be available for service through commissioning and testing.

Following the completion of each commissioning phase, OPG will formally request a removal of the regulatory hold point and submit the completion assurance documentation to provide evidence that all prerequisite and commitments have been met. OPG's completion assurance documentation will include the commissioning test results against pre-defined acceptance criteria and evidence that all necessary systems, equipment, procedure and qualified staff are available and ready to proceed with the next commissioning phase.

Any open items identified during the return to service activity will be identified, tracked and verified to completion.

To closely monitor the status of each prerequisite and open item, OPG will provide two completion assurance documents for each regulatory hold point. The first completion assurance document, revision 0 on this illustration, will be provided three months prior to the scheduled removal of the regulatory hold point. CNSC Staff will use this initial version of the completion assurance document to inform the schedule and scope of CNSC compliance activities.

OPG will be providing updates to the CNSC on the status of commissioning, testing, system restart activities and commitments as they are occurring and once they are completed.

OPG will submit a second version of the completion assurance document, Revision 1, 15 working days prior to the scheduled removal of the regulatory hold point to demonstrate that all prerequisites are complete and open items are addressed.

CNSC Staff will review the completion assurance documentation and ensure that all IIP commencement required prior to the hold point removal are complete, all prerequisites and deliverables have been met and all open items identify leading up to the hold point are addressed.

CNSC Staff will confirm that all construction, commissioning, restart and available for service activities required prior to the hold point removal have been successfully completed and that there are no impediments to the regulatory hold point removal.

Following their assessment, CNSC Staff will provide a report and recommendation to the Executive Vice-President and Chief Regulatory Operation Officer. Staff recommendation will be based on the results of compliance assessments, surveillance and inspection

activity.

Based on the review of this report, the Executive Vice-President will issue a record of decision for the removal of the regulatory hold point.

In closing, CNSC Staff have established process for regulatory oversight of the refurbishment project. Our processes are built on CNSC experience.

CNSC Staff are satisfied with OPG's progress to date on refurbishment and staff will continue to update the Commission on the status of refurbishment activities to our regular NPP status update Commission Member Document.

Furthermore, OPG and CNSC Staff will come back to the Commission for an update following Unit 2 return to service.

This update will take place in a public proceeding of the Commission with public participation.

This concludes staff presentation. We are available to answer any question that the Commission may have.

Thank you.

THE PRESIDENT: Thank you very much.

I'll open the floor for questions from Commission Members.

Dr. Demeter.

MEMBER DEMETER: Thank you for the very informative presentations.

The question I have for OPG, on slide 25 you talked about lessons learned and how that would be applied for future refurbishment.

Can you give us an example -- some examples of major lessons learned to help frame what kind of lessons you're learning and how you apply them?

MR. REINER: Dietmar Reiner, for the record.

Just in -- I'll start with just giving you a general characterization of our program.

So every work sequence or work procedure that gets executed in the field is looked at following execution, and we look at it through a lens of what would we do differently, what would we repeat because the outcome was good, and what actions are we going to take either for the next activity or the next unit. And we've got a very detailed register of lessons learned that we've collected.

And it can be things related to logistics for moving people and equipment. It can be specific things in, for example, when we started welding feeders. We started to weld feeders to the header pipe without pre-heating the header pipe.

We found by pre-heating we get a much

lower weld failure rate, so that's a very specific lesson that gets applied going forward.

We then make schedule adjustments based on that in some cases for next unit, and we are now in the midst of finalizing the schedule for Unit 3 and the associated cost estimate. In some cases, we've lengthened durations of activities. In other cases, we've shortened the durations. But the net outcome of that is a higher confidence level in the schedule and estimate that we put forward the second time through, and we expect the performance to go significantly better second time through.

MEMBER DEMETER: Thank you for that. That gives me some sense of an organic process that lets you continuous quality improvement, essentially.

Thank you.

THE PRESIDENT: Did you have anything to add, Mr. Rose?

MR. ROSE: I did. Sorry, Commission. Gary Rose, for the record.

I just wanted to add a real-life example. We did a project on Unit 2 called bulk vapour recovery system.

We repeated that project already on Unit 3 as part of our prerequisite projects for getting ready for

Unit 3. The challenges that were experienced on Unit 2 were resolved and not experienced on the work on Unit 3. In fact, we did that work, in essence, event free in about half the time that we had done it on Unit 2, in half the time and substantially lower cost.

So that is a good testament that our lessons learned process is working and effective, and if we can carry that on and get some of those benefits for all of the projects, I think that will set us up quite well.

THE PRESIDENT: So besides reviewing after each series of work packages, do you sort of stand back and look at the overall project and see, so what could we do differently next time.

I mean, it could be, you know, the interface with operations, for instance.

How do those lessons get captured?

MR. REINER: Yes. And we do -- we do exactly that.

Dietmar Reiner, for the record.

We do exactly that. So for example, when we -- on Unit 2 when we first began isolating the unit from the operating units, we very quickly discovered that there was a need for a defined protocol between refurbishment and operations that looked at potentially competing priorities and to establish a process where decisions can be made

rapidly and effectively, the right decisions for operating the plant and for executing the refurbishment project.

And we've taken that and incorporated it into the return to service process with appropriate protocols, so that's a more holistic look.

We've done additional things like if you look at innovation and technical things, well, we stepped back and we said what -- what improvements might there be that we could make to the retubing of a reactor.

And we're -- we're making an investment in a couple of significant changes in tooling and are looking, for example, at an option to simultaneously remove pressure tubes and calandria tubes from the reactor versus doing them sequentially.

And so those sorts of activities occur in parallel, longer duration. We've got -- we put teams in place that specifically focus on those with a target to have the things ready and tested for the next time we're executing the refurbishment.

THE PRESIDENT: Thank you.

Dr. Lacroix.

MEMBER LACROIX: Thank you for these presentation -- crystal clear presentation. I really appreciate it.

It won't surprise anybody in this room

that electricity is not a luxury; it's a necessity. Our quality of life depends on it so as the security and the safety. Hence my question is that from what I gather from the refurbishment plan, over the next few years, Unit 1, 3 and 4 will be down, so if I count correctly, 15 percent of all the electricity produced in Ontario won't come from Darlington. So I'm sure that you will tell me where it will come from.

But my major concern is not so much the electricity that is the energy produced, the kilowatt hour produced, but the capacity, the number of megawatts.

Will OPG have the capacity to face peak demands and avoid brown-outs?

MR. REINER: Dietmar Reiner, for the record.

So what -- just by way of clarification, the independent electricity system operator in the province of Ontario has accountability for ensuring that the energy and capacity needs of the province are met, and they do that planning on a very near term basis and out to quite a long term basis.

And you see that via a variety of documents that the -- that the IESO produces.

So in -- when we lay out our refurbishment plan, we submit those plans to the -- to the independent

electricity system operator, Bruce Power's plans get submitted, and the IESO then looks at any potential shortfalls in capacity or energy.

We also overlay our planned outages on top of that, and there is, from time to time, dialogue with the IESO to move an outage in order to ensure that there aren't brown-outs and there's a reliable supply of electricity.

So the plan as we have laid it out has been assessed by the IESO, and they do not anticipate that there will be shortages that could result in brown-outs.

And it is a -- as we progress through, there is a continual communication, an update of any plans. As we execute the refurbishment, obviously if there are schedule delays that would be important for the IESO to know, and that dialogue occurs on a regular basis between our organizations.

THE PRESIDENT: Ms Penney.

MEMBER PENNEY: Thank you for the presentations.

First let me start by congratulating you on your very excellent occupational health and safety record. No LTIs. Very, very good. And your TRIF is, you know, very good as well, so congratulations on that.

I had a question about what you call lead out, and I'm looking at your slide 24. And if someone

could pull it up, I'd really appreciate it.

On the Y axis it's the number of days, and I'm assuming for each of the steps. There is no X axis, so it's hard to know how they connect with each other.

But I'm looking at the heat-up and load power testing and then the high power test, so the first one is the one percent and the second one is the 35 percent, both of which are hold points as CNSC has put in place.

And I had a couple of questions.

One is, is there a separate what I would know as a commissioning team or is it kind of a subset of the operations team that's working with the project team to implement this phase, so that's one question.

The second is, what would you expect at one percent -- have you got criticality at one percent, or does that happen after or am I confusing things? Does criticality happen before that and one percent is what you're taking off the reactor and 35 percent is you're taking more off the reactor, more power off the reactor?

And what kind of things would you expect at those two steps that you have to worry about and put in your documents that CNSC has to oversee?

Thanks.

MR. ROSE: Gary Rose, for the record.

I'll jut start with the first part of your question about the organization.

We have a return to service director who is accountable for the work related to this -- you know, all of these activities in returning the unit to service, and that Director's been in place for some time because we've already returned 25 of our 58 systems to service, so that work is ongoing.

That return to service director reports to the Refurbishments Director of Operations and Maintenance, which is partnered and works very collaboratively with the station's Director of Operations and Maintenance.

So that team is in place focused in on ensuring that the plans are in place, that as systems are returned to service the commitments are met, the activities are completed, the documentation is in place, et cetera to be able to turn -- for configuration management purposes to be able to turn that paperwork and documentation over to the CNSC for appropriate inspections.

I'll ask Steve to speak to the actual hold points themselves.

MR. GREGORIS: Steve Gregoris, for the record.

So just to add to Gary's response for a separate commissioning team or not, so there is a very

focused part of the organization with the Restart Director that is looking at all of the requirements, all the steps that need to be done, how they're documented to move through all the hold points, whether they are internal or regulatory hold points.

The organization is such that all of those -- so the Director and all of the people under that Director will come under the Director of Operations and Maintenance of the Station as we move through start-up. Probably around the time we pulled the bulkhead is what we're looking at right now.

And so what we'll have, as we move in to operations of that unit, that organization must fly directly and have clear line of sight to the Director of Operations and Maintenance at the station.

And so the -- all the station work groups, they all work for me. Some are assigned in Refurb, and we do share across those work groups so that people remain proficient with the plant and are able to continue with their activities.

They will all work together under that Director of Operations and Maintenance for the restart and commissioning.

Specific to the question, at one percent full power, so these are the -- greater than one percent

and greater than 35 percent are power levels that aren't to be exceeded until hold points are met.

At one percent, you would expect -- the reactor goes critical at a much lower level, so you would expect the reactor to be critical. You would expect the reactor to be heated up.

There are certain things that we do such as hot conditioning to protect -- build a magnetite -- a black magnetite protective layer inside the heat transport system as part of its chemistry control and protection. There would be some commissioning at low power, flux detectors and reactivity devices that were replaced, in-core flux detectors.

So all of that will happen at low powers, and all that has to be confirmed to be operating correctly through the commissioning plans before we move through the one percent gate and beyond.

THE PRESIDENT: Staff, did you want to have anything to add to that?

MR. FRAPPIER: Gerry Frappier, for the record.

I don't believe so other than to say that all the various tests and the criteria for success of that test have been reviewed by ourselves and are, you know -- administratively are there, and so the performance will

determine, you know, what the results are, but it's very clear to us, as was just mentioned, for instance, flux detectors have to operate. If they don't, well, you can't go beyond. You're going to probably, you know, do whatever you have to do.

And so, the pass/fail, if you like, is very clear from our perspective and that's important so that we can have the confidence that it's appropriate to go to the next hold point and eventually to go fully back to service.

THE PRESIDENT: Thank you. Before we turn to Mr. Berube, I just wanted to add to the conventional safety comments made by Ms Penney again. I commend you for your exemplary record.

How many contract staff have gone through the refurbishment project who have been exposed to this great safety culture where they can take some of these best practices out in industry?

MR. REINER: Dietmar Reiner, for the record. We do track that. I don't have the number off the top, but it is thousands, it is several thousands and it may, in fact, exceed 10,000 if you look at all the folks that have been through.

We have an on-boarding process that we bring workers in, construction trades workers in for both

refurbishment and to assist in outages, and so they come in as the work demands dictate. And I think what we're seeing -- we also have collaboration agreements with Bruce Power that introduce some efficiencies into that process. So if there is training, new to nuclear training, for example, that they received from OPG or security clearances, those are transportable to Bruce Power and vice versa with only sort of incremental changes looked at related to the specific facility.

But I think what we're seeing is the result of our safety culture that we drive to in OPG making its way into the construction sector and, as a result, we've been able to see a downward trend and continue to drive a downward trend in performance.

But it does require sort of that constant attention, constant reminder. In pre-job briefings we've adopted a new practice now where we do what we call a stand up -- you've heard about stand downs when you have an event and you stop and you reflect on the event -- we've introduced stand ups where we proactively say, let's not wait for an event, let's just talk about specific issues, change in conditions, that sort of thing.

But we've touched many thousands of workers.

THE PRESIDENT: Thank you. Mr. Berube?

MEMBER BERUBE: A couple of questions but for the operator actually. I noticed on your presentation you're talking about replacing the shutdown computers and I'm curious as to why you're doing that.

Second of all, how the new computers are being verified and validated for service.

MR. REINER: Dietmar Reiner, for the record. Yes, a scope of work that we are executing is replacement of shutdown system computers and also some of the associated hardware.

The primary driver for executing that work is obsolescence and it's something that we have to deal with in managing the extended operations of Darlington.

We do have quite a rigorous process for testing software. The software code is not changing, it's a hardware upgrade, but still all of those tests need to be done and there is a process, it's executed largely by the engineering organization in our nuclear fleet, they provide that support for us and do all of that testing before we do the installation on the unit.

MEMBER BERUBE: So in that light, CNSC, I'm going ask you, in terms of the IIPs, onsite inspection, validation, verification before sign off, can you walk me through that process so that I understand how that's being done.

MR. FRAPPIER: Gerry Frappier, for the record. So, certainly as you know, there's hundreds of IIP commitments, some of which are inspected for compliance, some of which would be desktop reviews, if you like, an engineering review that might be done.

So, for instance, you were just talking about the new computer system. So, we would have our systems engineering division would have reviewed all that and perhaps there was things that they wanted to check as far as a test that was done by the engineering unit, so those would be in there.

So, do you want to have specifically the site ones that are sort of an inspector? So, for that perhaps I'll ask Nathalie and then one of our either inspectors or Kim to provide some detail.

MS RIENDEAU: So, as Mr. Frappier just indicated, depending on the IIP commitment, the modification, there's various level of verification. So I would ask our site inspector, or Kim, if she can speak to some of the inspection activities that were carried out for some of the major safety improvements like the EPG and the stop.

MS HAZELTON: Kimberley Hazelton, CNSC Power Reactor Site Office Supervisor, for the record. So, following CNSC staff review of many of the submissions that

OPG has made in support of the IIP removal, a number of items have been identified for site staff verification. They've also been subject to field inspections. Some of these would be a simple field verification that certain changes or modifications are in place as identified in the field. Some of them were subject to more detailed review of the packages provided of the requirements being met.

We did do verifications of some of the projects already mentioned such as the shield tank overpressure protection project, the containment filter venting system, so we did do a larger review of those projects.

THE PRESIDENT: Thank you. Dr. Demeter? Mr. Lacroix?

MEMBER LACROIX: Yes, thank you. The steam generators are not replaced because they are still fit for service, I presume. How often are they cleaned during their lifetime?

MR. GREGORIS: Steve Gregoris, for the record. Steam generators are part of the lifecycle management program. Our major components engineering group specifies the required inspections and cleaning. Typically they're done every three years as part of the planned outage cycle.

MEMBER LACROIX: Three years, okay. How

are they cleaned, mechanical means, chemical means?

MR. REINER: So, two processes. It's a mechanical process. Primary side is -- the analogy I'd give you is it's almost like a sand blasting on the primary side. On the secondary side it's a water lance cleaning.

MEMBER LACROIX: And if you compare a steam generator in a CANDU reactor versus a steam generator in a PWR, what are the differences in terms of the outing deposits?

MR. REINER: Dietmar Reiner, for the record. This is beyond my ability to answer here. Now we can get you an answer to that question, but I'll turn it over to Steve, he may have some insights he can share.

MR. GREGORIS: Steve Gregoris, for the record. So, the question I believe, Commissioner, was specific to BWRs, boiling water reactors; is that correct?

MEMBER LACROIX: PWR.

MR. GREGORIS: Oh, PWRs. So, in that case I would say on a secondary side there is not much difference, there's a similar type of steam cycle that happens and so that kind of cleaning would be similar for both.

But on the reactor side, conditions are quite different between those reactors, and so there would be different inspections. And the cleaning is quite

different. The cleaning that was done, I'll just clarify, in the refurbishment much more extensive than we would typically do in a planned outage.

MEMBER LACROIX: And what lessons have you learned over the years, in the sense that, do you find that there is more filing on the cool leg than on the hot leg, do you find a correlation with, I don't know, tube fretting or vibration? Could you expand on this?

MR. GREGORIS: Steve Gregoris, for the record. So, I don't have the details for the question, Commissioner. We can certainly get that to you. You know, what I would say is that we do our inspections, there are code standard requirements. We don't have any preferential type of degradation mechanisms or degradation occurring in those steam generators, they are very healthy as previously mentioned. And so I'll just say the high level, nothing specific to mention, but we'll certainly get you that information.

MEMBER LACROIX: The reason for these questions are related to the safety itself. The more you clean, the more you end up with wastes and you have to store this waste and eventually becomes a problem of contamination and storage, long-term storage.

MR. REINER: Dietmar Reiner, for the record. That is correct. And specifically the primary

side clean that we executed on the refurbishment, I believe in Mr. Rose's presentation there was a number there of 5,000 kg of magnetite. That does get stored in shielded waste containers and is a waste product that needs to be dealt with on a long-term basis as part of the refurbishment waste.

THE PRESIDENT: Ms Penney?

MEMBER PENNEY: A couple of short snappers. So, looking at OPG's presentation, slide 30, if you can just pull it up, and then we're going to look at slide 27.

So, slide 30, page 32 of 32, sorry, is a really quick one. Last slide. There you go. The question is, what's that?

MR. REINER: These are the stationary blades from a low pressure turbine, steam turbine.

MEMBER PENNEY: Okay, thank you.

--- Laughter / Rires

MEMBER PENNEY: The next slide is your "JOE", you called it. So integration, collaboration. I had a couple of questions about the JOE poster.

On the road you've got a D1941, what's that? And then towards the end of the road you've got a D2011. What do the numbers refer to?

MR. GREGORIS: Steve Gregoris, for the

record. So, D as in delta 1941, that is our Unit 4 planned outage which we're currently executing at Darlington.

MEMBER PENNEY: Oh, okay.

MR. GREGORIS: It's a significant milestone for us, we show it on the road map as one significant piece of work we'll do this year.

D as in Delta 2011, that is our 2020 Unit 1 planned outage that will be executed starting March of 2020.

MEMBER PENNEY: Right. And the other road posts along are recognizable because they all have -- they're all labelled.

Okay. And what is the role of WANO in 2020?

MR. GREGORIS: Steve Gregoris, for the record. So, in 2020 the WANO organization will send a peer review team to Darlington to review their operations as part of the two-year cycle for reviews.

MEMBER PENNEY: Okay. And is that tied in in any way to the regulatory hold points, or is it not connected in any way?

MR. FRAPPIER: Gerry Frappier, for the record. No, it's not part of the regulatory framework at all.

MEMBER PENNEY: Okay, thanks.

THE PRESIDENT: Mr. Berube?

MEMBER BERUBE: You'll have to bear with me, I didn't sit during your last licensing hearing so some of these questions are, I just don't know and it's good to know.

So, one of the questions that comes up is, you mentioned that the auxiliary cooling system was being put in. Is that on the primary heat transport system, or where is that exactly? And what's the reason for that? Is that Fukushima requirements or is there another reason for that?

MR. REINER: Dietmar Reiner, for the record. And I'll start off, others may chime in as well here. The Darlington station was designed with only a single shutdown cooling system and there was a longstanding plan in place and requirement from CNSC to address that during the refurbishment outage, so we are putting in an alternate system which essentially creates redundancy for the major components like the pumps and valves in that circuit. So that's the essence of the system being installed.

MR. GREGORIS: Steve Gregoris, for the record. That is part of our heat transport system, the system that provides cooling to the fuel primarily used in shutdown conditions when you're in an outage or low power

term of heat.

THE PRESIDENT: So, I have a few questions, hopefully quick ones. Based on experience at Lepreau, Pickering and Bruce, as you get ready for return to service what are some of the big challenges you anticipate, I don't know, is it fuel failure, is it FME, anything like that, or is this fairly straightforward?

MR. REINER: Dietmar Reiner, for the record. I'll start and I'll turn it over to Steve.

All of the examples that you mentioned. FME, for example, is a concern and we have programs in place to control FME any time we open up a system, so that is always a concern.

All of the inspections and tests and checks and commissioning that are done to verify that modifications that were installed operate as designed becomes a factor, I won't call it a concern, but a factor that could impact return to service.

The OPEX from other refurbishments actually highlights another interesting thing that we've consciously planned around in our refurbishment. Most refurbishments that were previously executed ended up with balance of plant equipment failures that overtook critical path, so valves that leaked and needed to be overhauled, electrical switch gear was left late and needed to be

overhauled and as critical path reactor work was complete the sort of reliability of this started to become an issue.

So we very consciously structured our schedule to execute those scopes of work well ahead in our refurbishment plan and execute all of the cyclic maintenance activities on systems that may have been laid up or idle during that refurbishment period so that we don't end up with that becoming a concern for us.

And maybe if Steve Gregoris wants to add anything to that.

MR. GREGORIS: Steve Gregoris, for the record. So, I'll add a couple of things that maybe go beyond just the basic commissioning plans and testing and everything that's documented that we'll step through and I'm confident we'll step through those.

The first thing I'll say is there's going to be a cultural change onsite. We have Unit 2, it is basically islanded and separated from the station. It's a big construction project and we are actively turning that back into an operating unit.

And as we do that our behaviours will have to change. Right now we don't have fuel in the unit, we don't have heavy water and those radiation hazards that would come, you know, with an operating unit and it's not connected to containment.

That's all going to change. And so the nuclear safety requirements that don't exist are going to come back and as they come back people will need to be aware, people will need to change some of those behaviours that were acceptable when those nuclear safety requirements were not there.

So, for instance, steam protection doors. Right now not required on that unit for the most part. Well, they will be required. And so the requirement to ensure those doors are closed and the behaviours that we follow to ensure that they, you know, alarm when they are open, they close on their own, they latch and we check. They will all have to come in place. That's one small example.

So that change in behaviour and how we manage the change and how we ensure we transition the workforce on Unit 2 to be, you know, I'll say at equal playing level with the rest of the units, that will be a challenge for us, but I see a good path forward with the way we've integrated the different work groups onsite.

The second thing I'll mention, as part of commissioning some things won't work exactly right and we expect that, that's part of commissioning. And so in developing our start up organization we will have teams ready to respond to different challenges so that they can

be focused on those challenges and work through them systematically so that we can solve those challenges and continue with the plant start up and commissioning activities.

And then, the last thing I'll mention is, it will be a heavy workload for the station and we recognize that. And so we are organizing ourselves so that we can manage safely the running units and have a good part of the organization, not just at Darlington, this is a nuclear priority for us, so Pickering and our corporate nuclear support to support the safe return to service of Unit 2 and to make sure we have the resources and all of the technical horsepower and operating and maintenance horsepower we need to do that.

THE PRESIDENT: Thank you. And, staff, anything from a regulator's perspective that has you concerned more than anything else?

MS RIENDEAU: It's not -- Nathalie Riendeau, for the record -- I don't want to, it's not a concern, but I think it's the importance and that's why we -- that's the approach that we try to illustrate in our presentation, that this is not a phase, we're actually working through this return to service. So, we've identified systems that have to be available for each regulatory hold point.

And as Dietmar and also Mr. Gregoris indicated, this work is ongoing right now and our verification activity is also ongoing. So that by the time it comes to consider the completion assurance document we have witnessed some activity, we have observed some tests, we have reviewed work packages, so we have this information and it's a matter of integrating that information and ensuring that the prerequisites are met, that the commitments are met, that the open issues are addressed.

So that is -- have to be rigorous, steady and it's also workload for all our team here in Ottawa and at site.

THE PRESIDENT: And how, as a regulator, are we overseeing the cultural changes that are necessary that Mr. Gregoris talked about?

MR. FRAPPIER: Gerry Frappier, for the record. First I'd just like to add a little bit to the first question you had, well, it fits into this, which is, this is a very, very big project, a very, very consequential project and has a very, very important set of schedules with them. And as we get to the end -- at this point in time, as indicated by OPG, they are ahead of schedule as far as what has to be completed, but as that gets closer and as that margin -- hopefully we still have lots of margin, in which case I have no concern for

schedule -- but we will -- certainly as we get closer to that OPG in particular will feel a lot, a lot of pressure with respect to maintaining schedule.

And as Mr. Gregoris mentioned, there will be things that don't go quite right. Is that enough to stop us moving forward on schedule or not becomes a very important decision, that I have no doubt OPG will put safety first and that will be important, but that's certainly what we will be looking for as well to make sure that if things are required to be done, that they are done. We don't feel the same schedule pressure, if you like, and I think that's one of the main benefits of having a regulator here.

With respect to culture, we do have our staff that is at site and have a certain feel for the culture as it's going. I don’t know if Greg Lamarre is here, he might want to add something specifically that we're doing on safety culture, or, Nathalie, if you have something.

--- Pause

MR. FRAPPIER: Ross Richardson is here from our Human Factors Group that can maybe add to this.

MR. RICHARDSON: Thank you very much. Ross Richardson, Director of the Human and Organizational Performance Division.

So just to add to the points that were raised earlier, what I can say is that we're aware that OPG has recently completed safety culture self-assessments in 2018 and some of our staff have been involved in some of the oversight of that. OPG is currently working on writing some of the self-assessment reports, which CNSC staff will be reviewing.

I don't really have anything else further to add, other than we're also looking at -- from our inspections activities, looking at perhaps training our inspectors or providing some awareness to our CNSC staff inspectors on some of the culture aspects that we spoke about at our MC presentation earlier this year.

THE PRESIDENT: Thank you. I think that would be a good idea. It's a big change and as a regulator, I think it would be good for us to maintain our oversight.

I see Mr. Dietmar has something he wants to say. Go ahead.

MR. REINER: Thank you very much, Madam President. Dietmar Reiner, for the record.

I just want to go on the record to say that we never compromise safety for our schedule. It's important for everyone to understand that. There are a number of things that help us maintain schedule without

ever having to cross that line and it rests in the quality of work and the testing that's done and the inspections that are done as that work progresses and it rests in having a robust schedule with the kind of detail in it that is reflective of what it takes to execute the work and being ready to execute the work when the time comes. We spent a lot of effort on that. That's part and parcel of the project management that we do. But I just wanted to go on the record to indicate that there will never be a compromise of safety due to a schedule pressure.

THE PRESIDENT: Thank you.

And one last question for staff on your Slide 9, on your compliance plan. This is your planned and completed inspections for 2018-2019 -- if we could have the slide up -- where there's quite a delta. I don't know if you explained why and what that's going to look like at the end of I guess fiscal year 2018-2019.

MS RIENDEAU: Nathalie Riendeau, for the record.

Currently we have seven type 2 inspections, our larger, more intensive inspections, planned for this fiscal year, 2018-2019, and, as shown on the slide, three have been completed and the other four inspections are launched, so they will be executed this year.

THE PRESIDENT: Very good. Thank you.

Okay. Anyone else for any questions on that?

So is the next update to the Commission going to be when it's going to be in a public forum?

MR. FRAPPIER: Gerry Frappier, for the record.

We made a commitment that each one of our NPP status updates we will also update with respect to the progress, if you like, on refurbishment, although it's usually a very, very small line, a paragraph, as long as things are going smoothly, just to have a bit of a feel for where things are at. I would expect more of an update as we get to removal of hold points and that so that the Commission is aware of hold points, the Commission and the public. From our perspective, the actual sort of next major discussion, currently what we've committed to -- but of course up to the Commission -- is that when the Unit 2 has returned to service that that would be a good time to come and provide a more perhaps focus on lessons learned and of that nature.

THE PRESIDENT: Right. So was that one -- do we anticipate that in Q1 of 2020, Q1, Q2 I guess depending on when the return to service is?

MR. REINER: Dietmar Reiner, for the

record.

Yes, I'd expect Q1-Q2 of 2020.

THE PRESIDENT: Good. Thank you very much.

Thank you both to OPG and CNSC staff for your presentation and for answering all our questions.

We will now break for lunch and we will reconvene at 1:30 p.m. Thank you.

--- Upon recessing at 12:29 p.m. /
Suspension à 12 h 29
--- Upon resuming at 1:31 p.m. /
Reprise à 13 h 31

CMD 19-M9

Written submissions from CNSC staff

THE PRESIDENT: The next item is the Event Initial Report regarding a worker injury of January 9, 2019, at the Canadian Nuclear Laboratories' Port Granby Project, as outlined in CMD 19-M9.

Representatives from CNL are available for questions by teleconference.

Ms Tadros, do you wish to add anything before we move to the questions?

MS TADROS: Yes, thank you.

Good afternoon, President Velshi, Members of the Commission. For the record, my name is Haidy Tadros and I am the Director General of the Directorate of Nuclear Cycle and Facilities Regulation.

For this item, with me today are my colleagues, Ms Kavita Murthy, Director of the Canadian Nuclear Laboratories Regulatory Program Division; Mr. Robert Buhr, Ms Zoe Reaume and Ms Liana Ethier, Project Officers in the same Division. Ms Ethier, as we mentioned this morning, is the CNSC staff in the Port Hope and Port Granby area.

We are here to take questions the Commission may have on this event that occurred earlier this year on January 9th, 2019, at the Port Granby Project site. Given the seriousness of the event and the public interest around CNL activities in the Port Granby area, CNSC staff determined it would be important to communicate this information to the Commission.

As outlined in CNSC staff's CMD 19-M9, a contractor was seriously injured on the job site when his leg got pinned to the ground by a roll-off bin. The contractor was airlifted to the hospital and treated for his injuries. We understand the contractor is recovering at home at this time.

Another employee was also sent to hospital due to the distress caused by witnessing the accident. This person has returned to work.

This event did not result in any kind of dose to the public or the workers and there were no impacts to the environment.

The details of CNSC staff's actions and the licensee's actions taken are captured in the Event Initial Report.

CNSC staff are currently completing our review of CNL's final report on the event and will be providing any further information related to this event during CNSC staff's Regulatory Oversight Report in the fall of 2019.

Thank you for the opportunity to provide a statement. We are available for any questions you may have.

THE PRESIDENT: Thank you.

I'll now turn the floor to CNL.

Mr. Parnell, do you wish to make any remarks before I open the floor to questions?

MR. PARNELL: Scott Parnell, for the record. We have no comments at this point in time.

THE PRESIDENT: Okay. Well, we'll start with you, Dr. Lacroix. Questions?

MEMBER LACROIX: Thank you.

Well, actually you've already answered my question, so no more questions.

THE PRESIDENT: Ms Penney.

MEMBER PENNEY: Thanks.

It's a very serious incident, high potential, could have killed the person.

The first question is about the injured person. Did they lose their leg or was it just severely hurt and they're okay?

MS TADROS: Haidy Tadros, for the record. CNL can provide an update on the worker.

MR. PARNELL: Scott Parnell, for the record.

The injured individual did not lose his leg. He went through surgery and he's expected to have full recovery.

MEMBER PENNEY: And I'm assuming that the provincial government is undertaking a review of this incident. When do we expect that incident review to be available?

MR. PARNELL: Scott Parnell, for the record.

The review is being performed by the provincial Labour group. They have up to two years to

complete the report and at this point in time that report is expected to go to the contractor and not directly to CNL. We would expect a copy when it does go out.

MEMBER PENNEY: And some of the changes that have been made I think have to do with where you allow these roll-off bins to operate now, but is there also -- is the contractor following up and looking at the mechanism? Because it was a failure of the roll-off mechanism that allowed it to happen when it shouldn't have.

MR. PARNELL: This is Scott Parnell, for the record.

So we do have -- the subcontractor has put in corrective actions to minimize the potential for this happening again. Several of those had to do with just keeping people out of the way while they're performing the activity. It really was not a failure of the mechanism itself. The mechanism was in the wrong spot and shouldn't have been in the individual's pocket.

MEMBER PENNEY: I've been around these trucks and they are scary and you're absolutely right, you have to have some way of actually marking where people can safely stand while operating it. Clearly, that wasn't the case? That's a question.

MR. PARNELL: Scott Parnell, for the record.

No, that was not the case when the injury happened. It is actually one of the corrective actions we've taken since the incident.

MEMBER PENNEY: And has CNL done an investigation themselves or was it joint with the contractor?

MR. PARNELL: Scott Parnell, for the record.

CNL is performing an investigation at this point in time.

MEMBER PENNEY: It's not jointly with the contractor? Has the contractor done their own investigation?

MR. PARNELL: Scott Parnell, for the record.

The contractor has done an investigation. CNL is doing a further investigation and the contractor is cooperating with our investigation. So they are part of it.

MEMBER PENNEY: Well, I would just expect to be updated on this at a later date when the investigations are complete. Thanks.

MS TADROS: Haidy Tadros, for the record.

And that is exactly what CNSC staff will do. Based on our review of the event and a final report

that we'll be submitting, we'll be providing an update in our Regulatory Oversight Report.

THE PRESIDENT: Mr. Berube.

MEMBER BERUBE: Yes. Thanks for these two EIRs. The format is excellent. The presentation is good and doesn't leave a lot to ask, so, quite frankly, that's why we don't have a lot of questions.

One of the things that I'm going to ask about is follow-up on an incident like this. Obviously, this is unfortunate, to say the least. It looks like an accidental activation of an unloading device, based on somebody putting it in a bad spot, but to me that just says bad design. So at the end of the day, how do we feed back that information? I mean here we're spending time and money on what looks to be an engineering problem. How do we actually feed that information back to the manufacturer and say, look, you have a serious design problem because this is what's happening with this stuff, just to get that kind of expertise back to whoever is actually making this stuff?

MS MURTHY: Kavita Murthy --

MR. PARNELL: Scott Parnell, for the record.

CNL has been in contact with the manufacturer of the roll-off truck and they have been very

cooperative in developing some engineering controls for that mechanism. That mechanism actually was put in place as a safety measure because a lot of the incidents they've seen in the roll-off bin activities is those bins tipping off the truck itself and getting people out of the way. So it was actually a safety feature that was put in place to protect the drivers. With that being said, they have already looked at putting the controller into a case. They're looking at redesigning the controller so you have to have actually two activations -- so you have to use two hands to activate it, which would minimize the potential for one hand hitting it up. As the stingers are actually coming out of the rails, there's a beacon, kind of like a backup beacon which activates when they start rolling out.

THE PRESIDENT: Thank you.

Dr. Demeter.

MEMBER DEMETER: Thank you for the very well laid-out report as well.

I just had a short question on the disposition. The second individual who became distressed over witnessing this accident was treated and discharged the same day in the hospital. For CNL, are they back to work and assistance being provided to them for the impact, psychological impact of this?

MR. PARNELL: Scott Parnell, for the

record.

Yes, the individual is back to work and he is doing well. We have had assistance provided to him through our EFAP process since day one.

MEMBER DEMETER: Thank you.

THE PRESIDENT: More a question for reassurance. The emergency response, the reporting, the public dissemination, all that worked fine and no learnings there? I'll ask staff first and then CNL.

MS MURTHY: Kavita Murthy, for the record.

Yes, there were no issues with disseminating the information. There was a Duty Officer call made right away. CNL had a site-wide halt on the use of the equipment, which was a good thing because they then did an extent-of-site evaluation to make sure that there wasn't similar equipment in operation at any of their other sites and they did find that there were some at the Whiteshell site and they were all grounded. There was public information published on their website and they posted on their Facebook to let the residents of the community know that there was an incident at the site.

THE PRESIDENT: Thank you.

Mr. Parnell, did you have anything to add?

MR. PARNELL: Scott Parnell, for the record.

I felt the communications went very well. As with any incident, we are going back to take a look at all the actions taken and we will be making some minor improvements based on the overall review of that communication.

THE PRESIDENT: Okay. Thank you very much. Thank you for that update.

The next item is the Event Initial Report regarding a power outage that occurred at CNL's Chalk River Laboratories on February 3rd, 2019, as outlined in CMD 19-M10.

Again, representatives from CNL and CNSC staff are available for questions, in attendance as well as by teleconference.

Again, Ms Tadros, I'll turn to you, do you wish to add anything before we move to questions?

CMD 19-M10

Written submissions from CNSC staff

MS TADROS: Yes, thank you.

Haidy Tadros, for the record.

For this item, Ms Kavita Murthy remains with me, and we are joined by Mr. Wasif Islam, Project Officer for this particular file and in the Canadian

Nuclear Laboratories Regulatory Program Division.

We are also joined by colleagues specializing in fire and emergency preparedness, security and systems engineering.

However, we note that we only have preliminary information at this time on this event. CNL is conducting a root cause analysis and CNSC staff will engage in a fulsome review once the detailed report is submitted. CNL will also be submitting their final report to CNSC staff on March 4th.

For the record and by way of a brief introduction of this incident, on Sunday, February 3rd, the Chalk River Laboratories site experienced a site-wide power outage as a result of an electrical malfunction. Employees in Building 701 on the Chalk River Laboratories site detected the smell of smoke and reported it to the Chalk River Laboratories emergency personnel. Emergency responders immediately conducted an investigation and checked the area surrounding Building 701, including an underground service space located adjacent to the building. It was in a man-hole adjacent to Building 701 that emergency responders discovered an electrical cable fire.

There were no worker injuries or impacts to the environment as a result of this incident. In addition, the event did not result in a dose to workers or

the public. Site security was maintained at all times.

As of February 6th, normal operations has resumed at the Chalk River Laboratories site and power has been restored to all the buildings. Given the situation is under control, with no immediate danger or high-risk safety significant concerns, CNSC staff will be providing an update on the event to the Commission during the fall 2019 Regulatory Oversight Report.

Thank you. We are available for any questions you may have.

THE PRESIDENT: Thank you.

I'll turn the floor to CNL.

Mr. Boyle, do you wish to make any remarks?

MR. BOYLE: Good afternoon, President Velshi and Members of the Commission. My name is Philip Boyle, I'm the Chief Nuclear Officer of Canadian Nuclear Laboratories and the Vice President for Operations and the Chalk River site licence holder.

I'm joined this afternoon by Sean Cotnam, who is the Chief Regulatory Officer for CNL and the Chief Security Officer.

Ms Tadros' summary was pretty well complete. I would add only that this was a slow-moving event. This did not start with the typical failure of a

cable where there might be a strong arc in an open breaker and then you're done. This was a small arc, we believe. We're in the middle of doing the RCA to prove what the situation was. But this arcing occurred for a number of hours, resulting in some burning of the cable insulation. That was the cause of the smoke and ultimately the small fire that occurred in one of the electrical conduits.

We have incidentally, I'd like to say, hired an external independent electrical forensic expert. We have some pretty savvy folks at CNL who have already started to do their analysis based on the indications of where they think this thing started and how it spread, but we'll have an independent review done and that will be the basis for the actions we take. We already, I will say, based on what we do know, have taken some actions.

THE PRESIDENT: Okay. Thank you.

We'll open the floor to the Commission Members for questions.

Ms Penney.

MEMBER PENNEY: So the backup generator came on automatically? It didn’t require you to flip a switch or anything?

MR. BOYLE: There are a number of different backup generators at the site. For the buildings that have their own independent backup generator, such as

the NRU facility, those generators came on automatically and provided power. We have a number of buildings that are powered by a central backup diesel generator. That diesel generator started, but its output breaker opened right after it attempted to connect and therefore a set of buildings were without both forms of power, normal power and backup power.

MEMBER PENNEY: And you've done an investigation on why your backup generator failed? I mean, that seems like a bit of a problem.

MR. BOYLE: Yeah, that is an important situation, certainly. The generator itself didn't fail, I just want to point out. Getting the power onto the grid did, which has the same effect, but it's a different problem.

That breaker was tested and it tested fine. It's been replaced with a new breaker, but it's part of the analysis of what was going on in the electrical system at the time, what would have caused that breaker to open at that point.

We could have closed it immediately, but with all the other indications going on, there was a hesitancy, as you might imagine, to reclose a breaker that had tripped. And there was no need in terms of the situation at the site to get power to any particular

building quickly, so we spent time making sure we knew what was going on before that breaker was reclosed.

MEMBER PENNEY: Quick question. I thought the NRU was shut down?

MR. BOYLE: The NRU as a reactor was shut down; it's defuelled. But as a building, it still exists and there's still heavy water in it and some other things that we man on a regular basis.

MEMBER PENNEY: Okay, thank you.

MR. BOYLE: Certainly.

THE PRESIDENT: Mr. Berube.

MEMBER BERUBE: Sort of a bizarre failure, isn't it? I mean, like a slow cook on a cable like this is unusual. So any gut feel as to what your investigators at CNL are telling you up front or do you want to share that with us at this point, or do you just want to leave that to the formal report?

MR. BOYLE: I'll tell you the last discussion I had with the folks that are doing the investigation, which was the finding of some cases in the past and some published papers about cables failing in this way, with a small break in the insulation resulting in a little bit of arcing, a little bit of tracking, carbon deposits, and having that occur over a period of time before the breakdown is great enough that there's a direct

short. But we will see from the review. I don't want to prejudge.

MEMBER BERUBE: Okay, so if that's the case, then you're looking at aging issues.

MR. BOYLE: Yes, sir, we certainly are looking at aging issues --

MEMBER BERUBE: Which means that you have to start looking at the rest of your cable plan pretty quick too, I think.

MR. BOYLE: Yes. I will tell you we are looking at the rest of our cable plan. A few years ago we initiated an annual electrical shutdown where sometime during the summer -- and the employees don't regret this too much -- we shut down for an extra day and we secure the electric distribution to the whole site for a Friday, Saturday, and a Sunday.

And during that time, we do cable testing, breaker testing, and in fact we have a rolling plan to test all of the cables. It's a Megger check, so it's not absolutely final, but it gives us good information. This particular cable is due for that inspection this summer.

But there may be other things we can do. There may be other indications that monitoring of the electrical system could tell us that this is happening. We have an indication that there may be something like that,

so we're working to that degree.

THE PRESIDENT: Dr. Demeter.

Dr. Lacroix.

MEMBER LACROIX: Yes, I do have a question: What is the radius of this cable?

MR. BOYLE: This cable -- I've not said "Phil Boyle, for the record" yet. I should be saying that routinely.

There are three phases, and each phase is probably four centimetres.

MEMBER LACROIX: Okay.

MR. BOYLE: I don't know, about that big around.

MEMBER LACROIX: Okay. So it's beyond the critical radius of insulation. Some electric cables, when they lose their insulation, they become exposed, and due to the fact that when they become exposed it increases the heat transfer on the surface and they catch fire. And but in this case, the radius is large enough so that's not the case. I was just curious about it. And you folks probably know that.

The other question is that are there other installations on site similar to this one? And if so, are they inspected?

MR. BOYLE: There are certainly other

installations on site that use cable at this voltage to distribute power. This particular cable by its information that's stamped on it was installed or at least manufactured in 1975, probably installed around the same time. So we're doing a check about other cables that are in that condition.

In this annual shutdown where we have looked at a set of cables along the way, we have done that from a maximum risk to a minimum risk kind of order, but we got to look and see whether we had our risk assessment right with this particular failure.

MEMBER LACROIX: Okay. Okay. And there's no way to predict this event in the sense that there's no monitoring except a regular inspection of the cables themselves.

MR. BOYLE: Well, if insulation becomes weak, that's normally tested by what's called a Megger check, which a high voltage applied -- much higher voltage than it normally carries -- to see if any current leaks. But you could pass that test, and say you have insulation that's brittle, and then under some event it cracks open. And so you went from okay to not okay pretty quickly.

THE PRESIDENT: Okay. Any other questions?

So if not, we'll await your investigation

report. And staff, once you've reviewed it, we'll leave it up to you to decide whether you should be coming back to the Commission to give us an update, depending on the significance of the findings, or wait until the next ROR update and let us know what has happened.

Okay, thank you very much for coming today and giving us an update on this. Thank you.

MR. BOYLE: Thank you.

THE PRESIDENT: Before we move to the next agenda item, I'd just like to ask staff if there are any other matters that they wish to bring to the attention of the Commission, any other EIRs or follow-ups.

If not, I understand, Dr. Demeter, you have a question regarding Isologic Innovative Radiopharmaceuticals that you now want to ask staff on --

MEMBER DEMETER: Yeah, based on the discussions at the last meeting on the ion issue, I was just wondering if there was any interim follow-up on practice, return to production, so forth.

MR. JAMMAL: It's Ramzi Jammal for the record, the designated officer that issued the order.

All I can report to the Commission currently is the licensee is working towards compliance of the conditions of the order. And the secretariat has received an opportunity to be heard by the licensee, so

staff are preparing a CMD with respect to the request of the opportunity to be heard by the licensee and that will be shared with the licensee.

The timing for this will be set by the secretariat, but from our perspective, staff will finish the CMD or the memorandum to Marc Leblanc this week.

If your question with respect to the training of staff, our regional office in Mississauga is on continuous contact with the licensee and the regulatory oversight to ensure that the licensee will comply with the conditions of the order. So the training did start, but I'm not going to prejudice the Commission with respect to the order itself. That information will be presented to you accordingly.

All I can report is, if there are any issues with respect to the supply, the supplier has confirmed there are no imminent shortage for diagnostic capsules for I-131.

MEMBER DEMETER: Thank you. I look forward to hearing at the Commission.

THE PRESIDENT: Thank you, Mr. Jammal.

Moving on to our next agenda item, which is on CNSC participation in the Single Window Initiative as outlined in CMD 19-M5. I'll wait for the team to come up front.

I note that a representative from the Canadian Border Services Agency is also joining us for the presentation and will be available for questions, so thank you for joining us.

Ms. Kathleen Heppell-Masys, I'll turn it over to you for the presentation.

CMD 19-M5

Oral presentation by CNSC staff

MS HEPPELL-MASYS: Good afternoon, President Velshi and Members of the Commission. My name is Kathleen Heppell-Masys, and I am the Director General of the Directorate of Security and Safeguards.

With me today I have Mr. David Reinholz, who is a Nuclear Non-Proliferation Officer in the Non-Proliferation and Export Controls Division, as well as Mr. Neil Babcock, Licensing Project Officer in the Nuclear Substances and Radiation Devices Licensing Division. And we also have our colleague from CBSA, and we have additional staff from the Directorate of Security and Safeguards, the Directorate of Nuclear Substance Regulation, the Information Management and Technology Directorate in order to answer any questions you may have.

We are here to present to you on the

successful CNSC involvement with the Single Window Initiative, also known as SWI.

I wanted to note an error on this slide. At the end of the first paragraph, where it says "through its licensing progress," it should read "through its licensing process."

The CNSC is responsible for import and export licensing of nuclear substances, nuclear-related equipment, and information.

In this regard, we are eager to share with you the CNSC's involvement in this ambitious Government of Canada program which focused on modernizing the import process, reducing the administrative burden on importers, and enhancing compliance verification for regulators.

This program is referred to as the Single Window Initiative, and the following presentation will give you a chance to hear more about its background and successes to date.

Our presentation on SWI will begin with a high-level overview of the CNSC import and export regulatory framework to give you a sense of why the CNSC was involved in SWI. From there, we will share with you the history of SWI and speak to its main objectives. We will then share what the CNSC developed in order to meet its SWI requirements and describe to you how the CNSC uses

SWI. Finally, we will conclude by outlining the benefits of SWI and summarizing the outcomes of our involvement in the project.

Before going further into discussing the SWI project, we wanted to give you a brief outline of the CNSC's import and export regulatory framework.

The CNSC's import and export reg framework is based on the *Nuclear Safety and Control Act* and its associated Regulations. Furthermore, the regulatory framework is used to implement Canada's international commitments, including the Nuclear Non-Proliferation Treaty, Nuclear Cooperation Agreements, and the IAEA Code of Conduct on Safety and Security of Radioactive Sources.

Importers and exporters of nuclear substances, prescribed equipment, and prescribed information are required to obtain a CNSC licence prior to importing or exporting those goods. For example, an importer is required to obtain a CNSC licence for the import of uranium into Canada from the United States. While some government departments authorize imports and exports when the goods arrive at the border, the CNSC authorizes the goods prior to their arrival.

The Canadian Border Services Agency, or CBSA, supports the CNSC's regulatory import and export compliance program by confirming imports and exports of

these prescribed goods that have been authorized by the CNSC prior to making an admissibility decision. While the CNSC provides import and export licences, the final admissibility decision resides with the CBSA.

Although the CNSC regulates both imports and exports, the SWI project was focused only on imports.

In 2011, under the Beyond the Border Action Plan, the governments of Canada and the United States agreed to, among other things, reduce the administrative burden on industry to facilitate trade and commerce between Canada and the USA, as well as to enhance perimeter security and regulation regarding the importation of goods.

The CBSA was to establish a single point of declaration through which importers could electronically submit all the information required to comply with Canadian government import regulations. This information is submitted to the CBSA via an integrated import declaration that we often refer to as IID. From this, the Single Window Initiative was launched.

The CBSA was assigned as the lead Canadian government agency for the SWI project, which included nine other participating government departments or agencies and involved 38 government import programs. Due to our mandate and role in the import licensing of nuclear substances,

prescribed nuclear equipment, and information, the CNSC was one of those nine departments participating with CBSA. The harmonization of these departments led to a single approach for importers to follow when bringing goods into Canada.

I will now pass the presentation to David Reinholz.

MR. REINHOLZ: Good afternoon President Velshi and Members of the Commission.

My name is David Reinholz, and I am a Nuclear Non-Proliferation officer in the Non-Proliferation and Export Controls Division.

For our involvement in the SWI project, the CNSC has three main objectives. The first objective is to develop a new tool to communicate import licensing information to the CBSA to allow for import admissibility decisions.

The second objective is to enhance the border-related verification process in order to allow for timely border-related decisions. This enhancement included providing CBSA with more CNSC licensing information, enabling CBSA officers to make better-informed decisions regarding imports of CNSC regulated goods from any country.

The last objective is to provide the CNSC with the ability to assess regulatory compliance with import authorizations through the receipt of electronic

import information from the CBSA.

In order to meet these objectives, the CNSC developed a new IT solution which provides CBSA with our internal import licensing information, which at the same time allows the CNSC to receive import transaction information from the CBSA.

As previously noted, one intention is to allow for timely CBSA admissibility decisions while at the same time allowing the CNSC to take further steps to ensuring compliance with both regulations and licence terms and conditions. Therefore, the IT solution is also capable of comparing or validating CNSC licensing information against the CBSA import information.

The development of this new IT solution allows for the exchange of information with CBSA, which created the ability for CBSA to electronically validate importer-submitted information against the CNSC licence information. This has resulted in a system which is able to provide admissibility recommendations to CBSA officers. Creating this electronic validation ensures that while border decisions will be more timely, they will also be more accurate.

Both CNSC and CBSA staff are able to review the imports before their arrival at the border, which helps ensure that any issues are identified in

advance and can be properly addressed.

While the new IT solution has created an environment for more timely decisions, it has also made the import process more rigorous. The new process ensures that licences which have been revoked or suspended cannot be used.

So we have developed a tool, but how does this tool work?

We can simplify the process by breaking it down into six separate steps.

For the first step, the importer will apply for a CNSC licence authorizing import. This application process was not changed due to the SWI project. If that licence is granted, the CNSC will provide the licence to the importer, both by providing a PDF copy through email and sending the original copy via mail.

While the licence itself is not provided to CBSA, all the relevant licensing information is transmitted from the CNSC system to CBSA for their retention.

Following the issuance of a licence, but prior to the goods arriving at the border, the licensee or importer can submit an integrated import declaration to the CBSA through the Single Window. This is where SWI was focused.

Once the IID is submitted, the CBSA system will check to determine if the goods are regulated by the CNSC. If it is determined to require a CNSC licence, the system automatically validates the IID information against the CNSC licence information. The system will identify the CNSC licence number and find the corresponding information which was provided by the CNSC. The system will validate all the relevant terms, for example, nuclear substance and quanity and validity period of the licence.

Based on the validation, the system will provide a recommendation to the CBSA officer either to release the shipment or to follow up with the importer or CNSC as necessary. The CBSA system will notify the importer when the import has cleared or that there are some issues which need to be addressed. In addition, the CBSA server automatically shares the import information with the CNSC for further validation.

I will now pass the presentation on to Mr. Neil Babcock, who will explain integrated import declarations and how we use them.

MR. BABCOCK: Good afternoon President Velshi and Members of the Commission.

My name is Neil Babcock, and I'm a Licensing Project Officer in the Nuclear Substances and Radiation Devices Licensing Division.

What exactly are these integrated import declarations? Once an importer decides to import their goods into Canada, they will submit an integrated import declaration to the CBSA through the Single Window.

The declaration is a single customs form which provides the required import information for all government agencies in one submission for all the goods contained in a particular shipment. Once submitted, the CBSA system will extract the information relevant for the CNSC and process it accordingly. Any declarations which require further CBSA validation are automatically flagged by the system for border officers to review.

How does the CNSC use these declarations?

The declarations are delivered to the CNSC through the Single Window portal to the IT solution developed by the CNSC. The information is delivered through a secured electronic connection.

Once the declarations are received by the CNSC SWI system, any declarations which require CNSC staff review are automatically flagged and listed in a dashboard. The declarations include the importer, licence number, the goods to be imported, and other relevant information.

This allows CNSC staff to review the import transactions against the regulations and licensing information and determine if there are any compliance

issues prior to the goods arriving at the border. Any issues can be addressed either by communication with CBSA or the importer as required.

Communication in advance of goods arriving at the border helps assist importers remain in compliance with the regulations and licence conditions while at the same time allowing the CNSC to ensure that any potential risks are addressed prior to the goods' arrival. In addition, it means imports of interest can be reviewed prior to leaving the exporting facility and those goods required for medical treatments do not get held up at the border.

How does this help importers?

Importers are now able to submit declarations electronically for all goods, and this can be done before the goods arrive at the border. In fact, it can even be done before the leave the facility. This helps ensure that licensed goods are cleared before they arrive at the border, preventing delays. In addition, any importers who do not have the required CNSC licence can be contacted in advance, allowing the opportunity to address issues and remain in compliance with CNSC regulations.

Through the SWI project, the CNSC has been able to replace legacy paper-based licensing processes with an IT solution. Our licensing information can be provided

directly to the CBSA from the CNSC, something that was not previously done. CBSA is also able to provide the CNSC with information on imports coming in to Canada before they arrive at the border.

This is also something that was not possible previously. Previously, CNSC Staff would be contacted by CBSA when the goods arrived at the border if required.

In addition to being aware of imports before they arrive, we're also able to perform additional compliance verification and conduct inspections as required due to better analysis of import transactions and trends. And a major benefit is being able to address any potential issues or risks prior to the goods entering Canada.

For example, if an importer does not possess a CNSC licence or an importer is attempting to use someone else's licence, this could be caught early.

The CNSC began using SWI with CBSA in April of 2017. At that time, all of the licences authorizing import had been integrated into the IT solution and were transmitted to CBSA.

The CBSA has processed approximately 255 IIDs for CNSC regulated goods, the first of which occurred in January 2018.

At this point, CBSA is still working with

importers to transition into using Single Window Initiative. Therefore, the number of processed transactions is expected to rise in the future.

Currently, paper declarations are still being accepted and there's not yet a date as to when they will be phased out.

I will now pass the presentation back to Mrs. Kathleen Heppell-Masys.

MS HEPPELL-MASYS: So in conclusion, from the CNSC's point of view, our participation to date in the SWI project has been a success. Through this initiative, the CNSC was able to establish an in-house IT solution which provides the ability to eliminate paper at the border.

The CNSC involvement in the whole of government collaboration on the SWI project will reduce the regulatory burden for importers, increase border security and enhance compliance.

The CNSC continues to work with CBSA in outreach efforts, and are looking forward to more importers using the system. Thank you.

THE PRESIDENT: Thank you very much.

Before we open it up for questions by Commission Members, Ms Illson-Skinner, do you wish to make any remarks?

MS ILLSON-SKINNER: No, I'm good. Thank you.

THE PRESIDENT: Okay. Thank you.

Well, let's start with you, Ms Penney.

MEMBER PENNEY: Thanks for this.

Any exercise that streamlines and -- you know, a process and gets us off paper is a good thing.

So I had a couple of questions. One is, I'm having a hard time visualizing how things can be caught early because the last point of control is at the border, so if a shipment shows up there, doesn't it have to be scanned there?

So how could it be detected early that they don't have a licence or their licence has been rescinded?

MR. BABCOCK: Neil Babcock, for the record.

When the importer makes their declaration through the IID process, CNSC Staff will see that ahead of time before the item arrives at the border, and we can then interact with the importer or the port of entry as required.

Otherwise, in situations where the -- say the importer hasn't used the IID, we would get a call from the border when the shipment arrives.

MEMBER PENNEY: So the last point of control is the border. It's whether they have an active licence or not. Okay. Thanks.

MR. BABCOCK: That's correct.

THE PRESIDENT: Mr. Berube.

MEMBER BERUBE: So this looks like a clever solution to getting rid of a lot of redundant paperwork, I think, obviously.

So what's the turnaround time on this? I mean, obviously you're taking it from days to, what, hours.

I mean, how many people at CNSC are actually reviewing, you know, licence applications or is the system doing this automatically? Is it assigning, you know, permit numbers?

How does it all work? How have you -- what human component is still in here?

MS HEPPELL-MASYS: So I will pass it on to my colleagues. I just want to make a little point that it is important to note that the rigour in the review of the process is still very much so present in this process, so the human component is very much so involved. So the rigour of looking -- of reviewing the licence, the decision-making process is still the same.

In terms of timings, I'll pass it on to my colleagues about the efficiency.

MR. BABCOCK: Neil Babcock, for the record.

With respect to the import declaration review, we're receiving approximately five of those a week from CBSA that require follow-up. There's a team of staff within the Directorate of Nuclear Substance Regulation that review the IIDs daily, and then we action them as required either contacting the importer/licensee for follow-up or clearing the border -- sorry, clearing the IID and making the recommendation to the border directly.

MEMBER BERUBE: So one of the questions I have is kind of interesting.

Do people try and smuggle, you know, this kind of material into the country? Is this a common occurrence, or what?

MS HEPPELL-MASYS: Well, I'll pass it on to my colleague from CBSA, but certainly the system that's in place requires a licence for the importers and also the IID, or the declaration. So those are the very two -- two key components.

We'd had a few cases, but I'll pass it on to you to see if you wish to comment further.

MS ILLSON-SKINNER: It's Becky Illson-Skinner, for the record.

I'm a Senior Program Officer with the

Policy Management Division of the Canada Border Services Agency, and the answer to that question is, we have lots of people that try and, of course, smuggle stuff in to Canada.

The unfortunate side of the other coin is that if they're trying to smuggle it, they wouldn't be giving us valid information in which to base risk off of.

So in terms of catching them, really, it comes down to Border Services, their officers, the instinct that they have and what they're looking at in the documentation review or it could be that they're working with a detector dog and they -- you know, they make a show that there's something wrong there.

There's all kinds of tools that we use to try and, of course, capture those that are trying to do something that's not legal.

That being said, we obviously don't catch everything.

If it's a CNSC good, though, as they've stated, they have to have the valid permit. And if they don't have a valid permit, we're either going to reject the entry, which would happen right now in a single window IID submission.

Like if the importer or the broker submits that data test and our system tries to compare that data with what we have on file and it doesn't match, we reject

it. And then we work with CNSC and the importer to make sure that that information is updated and then go through the process again.

So as long as they're reporting honestly, it wouldn't get through without that licensing verification.

MS HEPPELL-MASYS: And that is a new feature of SWI. That's the new benefit.

THE PRESIDENT: Dr. Demeter.

MEMBER DEMETER: Thank you for that interesting -- when we treat patients, we -- and they go to the U.S., we give them a letter that said they've got a radionuclide on board because they set off monitors at American Border Services.

So for nuclear materials coming in to Canada through Canada Border Services, do you have radiation monitors as well so that if someone didn't declare, it would still indicate there's something that you need to investigate further?

MS ILLSON-SKINNER: Absolutely. That's certainly one of the tools that we do have at our disposal, and I don't know how many of you have gone through the Ottawa Airport, but sometimes you'll be stopped and processed through a special lane, is what we call it. And exactly, they're looking for trace evidence of something

that shouldn't be there.

The down side, I guess, is it's random. You know, it's not like they're basing it truly off of anything. It's just a random inspection.

I've been inspected a couple times and, I mean, I've never, ever had anything on my record, so you know, when they choose me, they've chosen wrong. But that's how they do it.

There's no other way to really identify somebody who may be doing something illegal.

MR. MOSES: Colin Moses, for the record. I'm the Director-General of Nuclear Substance Regulation. If I could just supplement as well.

You're correct. There are portable monitors that can detect the nuclear substances that are moving across borders, and we actually do have a protocol with CBSA when they do get those detections to validate (a) whether a licence is required and (b) to confirm that they have that licence.

So we have had circumstances, for example, after Fukushima where contaminated car parts were coming in to the country or where elevated levels of cesium were detected on blueberries, and so we've worked with them to determine whether there is a risk associated with that import or not, and also to validate whether or not an

import licence from the CNSC is required.

MEMBER DEMETER: And sort of the converse, so Canadian importers use SWI. Canadian exporters going -- exporting products to the U.S., is there a counterpart that's similar for the exporters from the U.S. end, or is that a totally different system?

MS ILLSON-SKINNER: I'll answer that.

Currently, the Single Window system does not focus on exports at all, the reason being is when we first launched this new initiative our concern, obviously, is what's coming in to Canada, as it poses more of a threat in terms of the overall PGA uptake that we did for this initiative.

After speaking with David, I realize exports also can pose a threat, so at some point, you know, they will look at, probably, adding an export component.

It's just we're not -- we're not there yet. We're trying to get the import side taken care of first because of the risk that it does place Canada and Canadians in.

MR. REINHOLZ: David Reinholz, for the record.

I just -- I wanted to add to that.

As you know, while Single Window or SWI only focuses on imports, there is a process that we do have

in place with CBSA to validate exports.

Similarly, they have to submit a declaration for the goods that are being exported. There are CBSA staff who review these declarations, are familiar with CNSC regulated goods and they will look for CNSC licences, they'll verify the licensing information against the declared information.

The difference between the export process that we have and Single Window is that it's not done electronically, so it's done by a person looking at it.

So obviously you can't review the volume that an electronic system can review.

So you know, we're concerned about both imports and exports. We would like to see the system hopefully move to export. But that being said, we do have a system in place to capture exports as well.

Thank you.

THE PRESIDENT: And as far as imports, what percentage of CNSC licences have moved to SWI? Any sense?

MR. REINHOLZ: David Reinholz, for the record.

So we don't have a percentage of how many licensees are actually submitting IIDs. We can state that all of the CNSC licences authorizing import have been

transmitted into that system, so if an importer submits that declaration, it will be processed through SWI.

We had 255 IIDs processed by CBSA in 2018. Now, we are aware there's still a big uptake. We still are waiting to see more importers use the system. Unfortunately, we don't have the number of imports that are taking place via paper strictly because it is on paper.

Thank you.

MR. MOSES: Colin Moses, Director-General, Nuclear Substance Regulation.

If I can maybe just give a bit of perspective of the previous system before SWI for import.

So when it comes to nuclear substances, the Act, of course, prohibits the import of nuclear substance without a licence. And generally, the licence is issued by the CNSC. If there is a desire of the licensee to import, then that licence would be issued authorizing them to import.

And in the past or in the paper-based system, what would happen is with the movement of goods or the bill of goods, the CNSC licence would be photocopied and stapled to that bill of goods, and that would come to the border officer, who would review that. And if they had questions, they would contact us. If they didn't, then they were satisfied, that would move through.

In the past, what would happen is most ports of entry would photocopy the CNSC licence and, the end of the month, the CNSC would get a stack of paper, photocopies of CNSC licences that we had issued with no information in terms of the actual shipment, the good, the date of import, just a stack of CNSC licences.

So the advantage we have with this SWI is it actually validates with us when someone is making that declaration and we can gather that kind of information which will give us a lot more data that we can use to analyze the movement of goods, of nuclear substances across the border and what is coming in to Canada.

So we haven't even started leveraging that yet, but I think that gives us a wealth of data that we can use to better inform our activities and our oversight in the future.

THE PRESIDENT: Thank you.

MS ILLSON-SKINNER: And just to add to that as well in terms of Single Window Uptake, I wanted to inform everyone that as of January, we had 416 of our brokers or importers that are now certified to actually send a Single Window IID transaction.

We're at 96 percent of OGD regulated goods with those users.

That doesn't mean we're receiving from 416

of them, though. In January we actually received IIDs from 196 of them, which is much better than it was before.

But for those clients that are certified, there's two sides of their certification, if you will. They certify with CBSA to use our system, but then they also have their internal systems in which they use to process their business.

Not all of them that are certified have completed that work yet, so they know based on all the outreach we've been doing with them that they have until the 1st of April to get everything done. And at that point, the CBSA is going to start what we call decommissioning legacy service options and only have the IID as the available service option for three PGAs, actually, that have been on a legacy OGD release, which is the Canadian Food Inspection Agency, Natural Resources Canada for their Energy Efficiency Program, and Transport Canada for their tires program.

Now, what that means for importers of CNSC goods is if they have a shipment that's coming to the border and it's co-regulated with any of those three, they will have to submit a Single Window IID to get release.

So I would think that in the months ahead we're going to see the use of the IID go up astronomically based on the work that we're doing with brokers and

importers.

THE PRESIDENT: Thank you.

Dr. Lacroix.

MEMBER LACROIX: Could you put it on slide 11, please?

Right. Once a licence has been granted by CNSC to the importer and this licence you provide -- CNSC provides the information to CBSA and the importer also asks for an import, is it possible that CBSA turns down the IID by superseding the *Nuclear Safety and Control Act* or is it a completely different jurisdiction?

MR. REINHOLZ: David Reinholz, for the record.

If I understand your question correctly, you're asking about the admissibility decision at the border?

MEMBER LACROIX: That's right. Can they question the CNSC granting of a licence?

MR. REINHOLZ: So CBSA wouldn't question the granting of a CNSC licence, but they could for numerous reasons that don't involve the CNSC deny the goods to be entered into the country.

MEMBER LACROIX: Such as?

MR. REINHOLZ: For let's say co-regulated goods, so goods that could be regulated by the CNSC and,

let's say, another, you know, government agency, while they may have a CNSC licence they may be missing another, let's say, permit or licence, so that could be one reason why CBSA could deny an entry based on a good that had a licence that was coming.

THE PRESIDENT: Ms Penney.

MEMBER PENNEY: I don't want to suggest that we need another Phoenix solution, but to the CBSA, why did CNSC develop the software in-house? Did all those nine departments all produce individual pieces of software that don't work together?

Why didn't the CBSA come up a solution that all nine departments could use, or am I misunderstanding?

MS ILLSON-SKINNER: Actually, I think the solutions that have been implemented by the PGAs are all very similar in nature. It depended on how much budget they had. And as long as we can get what we need, I believe everything is in XML format, and that's how our agencies communicate with each other.

I wasn't on the beginning part of that project, and I hear them talking, so maybe somebody else has more to add. But to me, that's the answer.

It just depended on what the needs were of each agency.

So the CBSA dictated the format and everybody could then meet it.

MEMBER PENNEY: Okay.

MS ILLSON-SKINNER: That's correct. They would build their system to meet that and then each PGA, of course, had their own requirements in terms of what they were looking for.

So CBSA has a standard data set that each importer and broker must provide us in order to import goods into the country, but then for each PGA program, there's a separate set of data elements that are required by that specific PGA for their programs to make sure that the brokers and importers are meeting their requirements. And then they get one overall admissibility decision, which is why David was saying if there was ever a reject, it wouldn't be necessarily because of the CNSC licence. It would be another requirement by a different PGA that wasn't met.

And because they're in the same Single Window transaction, it would get rejected for that reason.

So when the system checks everything, every requirement for each PGA involved in that shipment had to have been met to get a release.

THE PRESIDENT: Mr. Berube.

Okay. Back to you.

MEMBER LACROIX: Yes. I do have a question concerning the simultaneous operation of the system with the -- what you call the paper-based declaration.

Is there a loophole? Could there be a safety issue?

MR. REINHOLZ: David Reinholz, for the record.

While they're still accepting the legacy paper-based system, we wouldn't characterize it as a loophole. It's the -- it's the same process that was done before.

So you still have CBSA officers, you know, looking at the declarations, verifying licensing information. The difference there is it's happening by officer, not the electronic system.

So that's where you, at the border, don't see that, you know, time savings.

So when you arrive at the border, you might get stuck waiting to get your goods cleared.

It's the process that's been done for years. CBSA officers get training on CNSC regulated goods. They -- you know, how to identify them, and any issues that they do discover on those, they will contact either the CNSC or the importer.

So it's a very similar process. It's just one's done electronically versus one being the human intervention.

MEMBER LACROIX: So you don't see any problem.

MS HEPPELL-MASYS: The rigour is applied in the two cases, the same rigour.

MEMBER LACROIX: Okay. And how long will the paper declaration still exist?

MS ILLSON-SKINNER: That is a great question, for sure. And I know that the CBSA does intend to move to one service option for release, and that service option will be the integrated import declaration or some version very close to that called something else.

When that will happen, we're still working on that internally. In terms of timelines, it won't be in the next year, for sure. Maybe in the next two to five depending on what is determined in the end it would be required to do that, especially because that new one service option for all imports would also need to be integrated with our new CARM solution that we're doing.

It will be some time away, but I look forward to the day when we do only have one because the single -- actually, I don't know if we've mentioned that yet, but the Single Window IID service option can be used

for non-regulated goods.

So it's already doing what we'd like to see it do in the future, but have everything, everyone go through that one service option instead of having these other ones they can still rely on.

MEMBER LACROIX: One quick question concerning slide 7.

There are many organizations and departments participating in the Single Window Initiative, and I've noticed Health Canada and Public Health Agency. For the benefit of my colleagues and I, could you tell us what's the difference between Health Canada and the Public Health Agency?

MS ILLSON-SKINNER: Certainly.

Health Canada is for consumer products, blood -- let me think here. Food and drugs. Whereas Public Health Agency of Canada is more focused on infectious diseases.

So it's -- they're different, and they have a little bit of a different mandate.

MEMBER LACROIX: In other words, one is focused on the products and the other one on medicine?

THE PRESIDENT: Okay. If there are no more questions, thank you very much for this briefing.

This concludes the public portion of the

meeting of the Commission. The Members will now proceed in a closed session for a technical briefing on security and safeguards.

Again, thank you all for your participation.

--- Whereupon the meeting concluded at 2:37 p.m. /
La réunion s'est terminée à 14 h 37