

**Canadian Nuclear  
Safety Commission**

**Commission canadienne de  
sûreté nucléaire**

**Public hearing**

**Audience publique**

**June 25<sup>th</sup>, 2018**

**Le 25 juin 2018**

**Pickering Recreation Complex  
1867 Valley Farm Road  
Pickering, Ontario**

**Complexe récréatif de Pickering  
1867, rue Valley Farm  
Pickering (Ontario)**

**Commission Members present**

**Commissaires présents**

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

**M. Michael Binder  
M<sup>me</sup> Rumina Velshi  
D<sup>r</sup> Sandor Demeter  
M<sup>me</sup> Kathy Penney  
M. Timothy Berube  
M. Marcel Lacroix**

**Secretary:**

**Secrétaire:**

**Mr. Marc Leblanc**

**M. Marc Leblanc**

**General Counsel:**

**Avocate générale :**

**Ms Lisa Thiele**

**M<sup>e</sup> Lisa Thiele**

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Pickering, Ontario / Pickering (Ontario)

--- Upon commencing the public hearing on Monday,  
June 25, 2018 at 1:30 p.m. / L'audience publique  
début le lundi 25 juin 2018 à 13 h 30

### **Opening Remarks**

**M. LEBLANC** : Encore bonjour, hello again, Mesdames et Messieurs. Bienvenue à l'audience publique de la Commission canadienne de sûreté nucléaire.

The Canadian Nuclear Safety Commission is about to start Part 2 of the public hearing on the application by Ontario Power Generation, or OPG, for the renewal of the Nuclear Power Reactor Operating Licence for the Pickering Nuclear Generating Station.

Please note where the emergency exits are, the two doors at the back of the room, and the bathrooms are located near the entrance to the main lobby as well as another bathroom near the back of the room.

During today's business, we have simultaneous interpretation.

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

We would ask that you please keep the pace

of your speech relatively slow so that the interpreters have a chance to keep up.

I would also like to note that this proceeding is being video webcast live and that the proceeding is also archived on our website for a three-month period after the close of the hearing.

The transcripts will be available on the website of the Commission in about two weeks.

To make the transcripts as meaningful as possible, we would ask everyone to please identify themselves before speaking.

And as a courtesy to others in the room, please silence your cell phones and other electronic devices.

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

Mr. President...?

**THE PRESIDENT:** Merci, Marc.

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

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

I would like to begin by recognizing that we are holding this public hearing in indigenous traditional territory.

Je souhaite la bienvenue aux gens ici présents, and welcome to those joining us via webcast.

So, first of all, on behalf of the Commission, I would really like to tell you how happy we are to be out of Ottawa, in Pickering, and I heard some music and I didn't hear Shawn Mendes.

--- Laughter / Rires

**THE PRESIDENT:** For all of you who don't know, he is a native of Pickering. I expected that to be the number one song here. Maybe later.

So thanks to all of you who made our presence here really enjoyable and we like this large recreational facility, so thank you for that.

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

On my right are Dr. Sandor Demeter and Ms Kathy Penney; on my left are Mr. Timothy Berube, Ms Rumina Velshi, and Monsieur Marcel Lacroix.

We heard from our Secretary Marc Leblanc. We also have Ms Lisa Thiele, Senior General Counsel to the Commission, with us here on the podium.

**CMD 18-H8.A****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 CMD 18-H8.A.

Do we have concurrence?

So for the record, the agenda is adopted.

Marc...?

**MR. LEBLANC:** As indicated earlier, this is Part 2 of this public hearing. The first part of the public hearing on this application was held in Ottawa on April 4th.

The Notice of Public Hearing 2018-H-03 was published on September 29th, 2017, and two revisions were posted regarding the change of location and the addition of June 25th and 29th to the agenda.

Presentations were made on Part 1 of the hearing by the applicant, Ontario Power Generation, under Commission Member Documents, or CMDs, 18 H6.1 and 18-H6.1A, and by Commission staff under CMD 18-H6 and 18-H6.A. These documents are available on the CNSC website.

The public was invited to participate either by oral presentation or written submission. May 7th was the deadline set for filing by interveners. The

Commission accepted 155 requests to intervene. A few requests for intervention were refused as being filed past the deadline or containing intemperate language.

June 12th was the deadline for filing of supplementary information. I note that presentations and supplementary written submissions have been filed by CNSC staff, OPG and several interveners.

The Commission received this morning three requests for ruling pursuant to Rule 20 of the CNSC Rules of Procedure. We understand that the requests were served to OPG. The Commission sees no need to rule on these requests at this time. These requests will be filed into the record.

Participant funding was available to interveners to prepare for and participate in this public hearing. Nine groups or individuals are receiving funding. The funding decision made by an independent Funding Review Committee is available on the CNSC website.

To support the CNSC's efforts in being an environmentally responsible organization, paper copies of the submissions are no longer distributed as they are now all available electronically on the CNSC website.

To give you a sense of how the day will unfold, we will first hear the presentations by Ontario Power Generation and CNSC staff. After that we will take a

break and then we will hear the presentations from six interveners, following the order that is listed on the revised agenda. There were supposed to be seven interveners, but one intervener, Ms Kelly Clune, scheduled to present this afternoon is unable to present and her intervention will be considered at the same time as other written submissions.

There will be an afternoon break around 3:30, and we'll break for dinner around 5:30 p.m. Time permitting, the Commission will also review written submissions at the end of each day. These written submissions have already been read by the Members, and we will address each of them before the close of this hearing.

Fifty-five intervenors are scheduled to present orally this week. While the presentations are limited to 10 minutes, Commission Members will have the opportunity to ask questions after each presentation, and no time limit has been ascribed for the question period.

Your key contact persons will be Ms Louise Levert and Ms Johanne Villeneuve, that are at the back of the room or at the side of the room down there, from the Secretariat staff. And you'll see them going around or at the reception table if you need information regarding the timing of presentations and other logistical considerations.

Mr. President.

**THE PRESIDENT:** Thank you, Marc.

I'd like to start this hearing with a few additional introductory remarks.

We are in Pickering the next five days to consider the written submissions and oral presentations from OPG, CNSC staff, and a large number of citizens and organizations who wish to express their opinions in the context of the Pickering Nuclear Generating Station operating licence renewal hearing.

I would like to clarify a few things prior to getting this hearing underway. I wish to emphasize that the Commission is a quasi-judicial administrative tribunal and that, consequently, it is independent from any political, governmental, or private-sector influence. In fact, each Commission Member is independent of one another and also independent of CNSC staff.

Submissions filed for this hearing include recommendations to the Commission. CNSC staff also make recommendations to the Commission, but it is the Commission Members who will render a decision based on all evidence presented in the context of the hearing process.

The Commission Members are appointed by the Governor in Council on the basis of their achievements in their respective fields of endeavour as well as their

excellent reputation among their peers. Their mandate is simple: ensure that the use of nuclear is done in a manner that protects the environment as well as the health, safety, and security of the workers and the public.

I would also like to emphasize the CNSC has no economic mandate and will not base its decision on the economic impact of a facility. I will repeat it: It is the health, safety, and security of the public and the protection of the environment that guides its decisions.

Several intervenors have raised concerns regarding the risk and cost of this project to the public health, the environment, and the finances of the Province of Ontario. I trust that you will understand that the Commission is an administrative tribunal, does not have the statutory authority, and will not consider questions that are of a political nature, and that it is the Ontario provincial government that must address this concern that relates to fundamental energy policy questions. If Ontario decides that nuclear remains part of the energy mix, the role of CNSC is to ensure it is safe.

Finally, as I stated earlier, the Commission is an administrative tribunal. It is willing to conduct this hearing in or near affected communities and to provide a forum where members of the public can express their views on the matter at hand. As the Commission is a

tribunal and wishes to hear all oral presentations, consider all written interventions, and ask as many questions as it deems necessary on these, we ask that everyone respect the decorum of a tribunal setting and assist with the orderly, civil, and respectful conduct of these proceedings.

The Commission will not tolerate inappropriate behaviour, and will take measures necessary to ensure the orderly conduct of this proceeding, in the same way it does for all other proceedings it conducts in Ottawa and in the communities.

Thank you.

So before we start with the presentations, I want to note that there are representatives from other government departments and municipalities joining us for this hearing, available to answer questions after the presentations.

In attendance today, we have staff from Fisheries and Oceans, who are here or online. Welcome.

We also have people from Department of Environment and Climate Change through teleconference. I understand Ms Ali -- are you online?

**MS ALI:** Yes, I'm online.

**THE PRESIDENT:** Okay, welcome.

We also have other provincial and federal

departments who will be joining us throughout, in fact, the five days that we are here. And we'll introduce them as the time comes.

So finally, I would like to turn the floor to Ontario Power Generation for their presentation, as outlined in CMD 18-H6.1B and H6.1C. I understand that Mr. Lyash will make the presentation. Over to you, sir.

**CMD 18-H6.1B/18-H6.1C**

**Oral presentation by**

**Ontario Power Generation Inc.**

**MR. LOCKWOOD:** Good afternoon, President Binder and Members of the Commission. For the record, my name is Randy Lockwood and I'm the senior vice-president, Pickering Nuclear, at Ontario Power Generation. And I'm responsible for the safe and reliable operation of the Pickering Nuclear Generating Station.

The OPG is pleased to be before the Commission once again, and especially that we are here in our local community. Moreover, we would like to acknowledge that we are in the traditional and treaty territory of the Mississauga Anishinabeg.

Today I have the pleasure to introduce on my left OPG's president and chief executive officer, Mr.

Jeff Lyash. He has over 30 years of industry experience. He was previously the CEO of one of the largest US power engineering procurement and construction organizations and has extensive nuclear plant and regulatory experience at all levels. For instance, Jeff spent close to 10 years working in the US Nuclear Regulatory Commission in a number of senior technical and management positions, such as senior resident inspector at the Peach Bottom Nuclear Station. He also held a senior reactor operator licence from the NRC.

Alongside me again today on my right is Steve Gregoris, deputy site vice-president, Pickering Nuclear. And in addition, other members of the OPG team are seated behind me.

On behalf of the entire OPG team, it's our pleasure to participate in these proceedings to have this opportunity to further substantiate our case for Pickering licence renewal.

In a moment, I will ask Mr. Jeff Lyash to offer some opening remarks and share his broad perspective on Pickering licence renewal and how it plays a key role in OPG's social licence.

In the rest of our presentation, I will briefly summarize our fundamental commitments and our main requests of the Commission. I will also briefly reiterate

our supporting case for licence renewal and how OPG will continue to invest in this station to make Pickering even safer tomorrow to secure Ontario's clean power future.

Mr. Steve Gregoris will then provide further clarifications on some items from part 1 hearing, and respectfully, on behalf of OPG, he will share our assessment of the various interventions which have been submitted by the intervenors.

To close, I will present our overall conclusions. We hope you find our presentation to be informative and useful.

I will now pass the presentation over to Mr. Jeff Lyash.

**MR. LYASH:** Good afternoon, President Binder, CNSC Commissioners, and CNSC staff. My name is Jeff Lyash, president and CEO of Ontario Power Generation, and I'm pleased to be here with you and to have the opportunity to address you today.

Now, I realize that over the next few days, you'll hear a great deal of information, so I will be brief.

I do, however, want to take the opportunity to acknowledge and thank President Binder for his 10 years of leadership of the CNSC and his dedication to nuclear safety in Canada, and to congratulate Ms Velshi

on her appointment as incoming president. These are vital roles that help to ensure the safety of all Ontarians and Canadians, and you are to be much admired for taking up that mantle.

I also want to provide some context for our licence application, the application that's before the Commission during this public hearing. By design, this hearing provides the public the opportunity to review OPG's extensive submissions validating the safety case for operating Pickering to 2024. It also encourages public dialogue on the safety of Pickering and allows for scrutiny of OPG's performance. We welcome this important process.

With regard to nuclear safety, we certainly hold ourselves accountable to the Commission, but also to our shareholder the Province, to our employees, and to the public. As a company, safety is our top priority, and we strive to demonstrate this commitment each and every day.

I'm extremely proud of the strong safety record that we've built at our nuclear stations, one that we will continue to strengthen. More specifically, we are pleased that Pickering received the CNSC integrated plant rating of fully satisfactory in each of the last two evaluations, a level of recognition that we are committed to maintain.

In addition to our ongoing mission of ensuring the safe operation of this station, for close to three years an additional element of our mission has been to prepare the station for continued operations through 2024. We have made significant investments to upgrade and replace equipment, investments that resulted in improved reliability, and a year-over-year production increase of 1.5 terawatt hours for 2017.

We also focused our attention on some of the major undertakings that you heard about at Part 1 of the hearings, and which you will hear more about this week, including a periodic safety review to ensure alignment with modern codes and standards.

The safety case for Pickering is strong. It's strong because of these continued investments, but it is also strong because of the people. Over the course of my career I've had the privilege of working at multiple nuclear generating stations, and as Randy mentioned, with the U.S. Nuclear Regulatory Commission as a nuclear safety regulator. Here at OPG, and at Pickering, we have a very dedicated and diverse workforce with a wide range of skills and a great deal of experience. They are highly engaged, with an absolute passion for generating nuclear power safely, and they are keenly focused on innovation and the role nuclear power will play in building sustainable

solutions for Ontario's future. Based on my broad experience, they are some of the best in the business.

I understand this hearing is focused on nuclear safety, as it should be, and as President Binder counselled us at the outset, but I observed, as he did, that a number of interventions raised questions on the economics of operating Pickering to 2024. Just to provide some broad information on this topic, I'd like to take a minute to address these comments upfront.

The notion embedded in these interventions is that continuing to operate Pickering is somehow not worth the investment we're all making in the plant and the process, the investments you and we are making here today. In my view, nothing could be further from the truth. Our nuclear fleet produces nearly 35 percent of Ontario's electrical needs on an annual basis, and it does so at a cost of 7.9 cents per kilowatt hour, lower than any other form of generation, save for our legacy hydroelectric generation. This was confirmed in the OEB's recent regulated price plan.

We recently completed what is arguably the most extensive rate case in the OEB's history to examine our costs. As part of that process, the OEB established performance base rates, which we fully support. These will

help ensure that our nuclear output continues to provide value to ratepayers.

Pickering, with a successful outcome of this proceeding, will remain a valuable asset for the people of Ontario, providing continued returns on their investments. It's an asset that is prime to provide clean, safe, and reliable baseload electricity to mitigate capacity uncertainties during the overlapping refurbishments of the Darlington and Bruce nuclear units.

IESO's cost-benefit analysis estimates significant positive savings for Ontario's electricity system as a result of Pickering's continued operation. I'll note that alternatives, such as the import of large amounts of energy from Quebec, largely without firm capacity behind it, which Pickering provides, would cost Ontario more, but just as importantly, would introduce system reliability issues that we should concern ourselves with.

There are also other equally tangible benefits for the people of Ontario. Operating Pickering to 2024 will reduce greenhouse gas emissions by an estimated 17 million tonnes. This is the equivalent of removing 3.4 million cars per year from Ontario's roads, protecting our environment.

About 7,500 direct and indirect jobs are maintained in the province through the duration of the licence period, adding over \$12 billion of Ontario GDP, according to a recent study done by the Ontario Chamber of Commerce.

My view is that this next chapter in Canada's nuclear history will be a bright one. On a weekly basis, the industry is breaking new innovative ground. Our very own Pickering X-Lab is turning out unique products and solutions, with applications that improve safety in the nuclear industry and beyond.

OPG, Bruce Power and Nordion are partnering to provide more than half of the world's cobalt-60, which plays a critical role in keeping hospitals and patients safe through the sterilization of surgical supplies and single-use medical devices, and 20 percent of that global need for cobalt-60 is supplied right here at Pickering.

As a company, we are looking to take these types of nuclear applications to the next level, for example, expanding the production of medical isotopes to our Darlington nuclear station, which pending regulatory approval will be the only North American source of molybdenum-99, an isotope used to help detect illnesses like cancer and heart disease in over 30 million diagnostic

and medical-imaging treatments around the world each year.

The value of Canada's nuclear program, and Pickering as a part of it, has never been greater. The enthusiasm and momentum we build here is helping to create a great culture at OPG that supports the most important of our four strategic imperatives, that is, maintaining our social licence and public trust. I can't emphasize this point enough. Without a strong social licence, we quite simply would not be able to operate our generating stations.

In support of this social licence, we are committed to openness and transparency in our operations, continuous dialogue with our host community, investment in environmentally-focused initiatives, and ongoing public and indigenous community engagement.

In this last area, OPG is proud of its ties to the indigenous peoples of Canada. These ties are based on mutual respect and have led to new commercial partnerships, helping to bring jobs, growth and economic development to indigenous communities. We've developed a successful partnership with indigenous communities on projects that provide a generational income through equity ownership, development of first nations businesses through the award of contracts in support of our projects, and hiring and training of community members that provide them

with new marketable job skills. Recent examples of this include the Peter Sutherland Sr. hydroelectric generation station, developed in partnership with the Taykwa Tagamou First Nation, and the Nanticoke solar generating station being developed on the site of what was once Ontario's coal-fired generating station, in partnership with Six Nations. Work is under way with the Gull Bay First Nation on a microgrid project that will lessen that remote indigenous community's dependence on diesel for electricity.

Our highly-skilled team has a lot to share with you this week about the safe operation of our Pickering station, so I'll let them take the floor, but please allow me one last closing remark.

On behalf of the OPG board of directors, we are thrilled with Pickering's strong performance. It can be even better. Pickering is safer now than it has ever been. We are proud of the team that got it there.

As a company, we, along with our shareholder, are absolutely committed to continued investments in our plant and our people. We are committed to ensuring the safe operation of Pickering through 2024, and we are committed to ensuring that the last day of Pickering operations will be the safest, most reliable, most cost-effective day of its entire operating lifetime.

Thank you for your time.

**MR. LOCKWOOD:** Thank you, Jeff.

Randy Lockwood, for the record.

In our presentation at the Part 1 hearing we discussed six fundamental commitments which we have put forth to underpin our supporting case for the extended operation of the Pickering station. These commitments reflect the main areas of responsibility that OPG bears to the public and to the CNSC. They represent our promises and obligations, which are at the very heart of our safe and reliable operations. They are not new. All along Pickering has been living up to these promises, and I personally commit and can assure you that they will continue to be honoured over the next licence term. I say that with conviction because the Pickering team, we're the best team in the industry.

Moreover, Pickering is heading into the next licence term with some of its best performance in the history of the station. At the Part 1 hearing, and in the CMD, we cited examples in the areas of industrial safety, backlogs, equipment reliability, and forced loss rate. These could not be possible without the constant dedication to and the fulfilment of these fundamental commitments.

Upholding nuclear safety. Safety is our core value. Without question, it underpins everything we

do at our station. Nuclear safety will always be our number one priority.

To further illustrate to you and to the public the robustness of the defence-in-depth provisions in place at Pickering, we have made available a video as part of our supplemental CMD for this hearing. We would be happy to discuss that video, if you so wish, and we hope that you found it to be informative.

Assuring fitness for service. We have in place proven and comprehensive programs to regularly inspect, test, maintain and evaluate station equipment and components. That is how we will always know that the plan will be safe and reliable to operate through the next licence term.

Sustaining an engaged workforce. An engaged workforce is about having the right number of people with the right skills and attitudes doing the right work at the right time. Our Pickering staff are energized, engaged, and motivated. They are proud of the work they do, and it's reflected in our healthy safety culture at Pickering.

Staff engagement and motivation will remain a focus at Pickering to ensure continued safe and reliable operation.

Maintaining low impacts of operation. This applies to environmental protection, radiation

protection of workers and the public, conventional health and safety of staff and waste management. We have a duty to protect and we take this seriously.

Supporting transparency and engagement with the public. OPG appreciates that the public has legitimate interest in Pickering operations. In fact, public trust is a key core driver of our social licence. For that reason, we will continue to support openness and transparency and frequently engage with the public.

It's a commitment we hold dear and that we demonstrate every day through our support of the community's safety and environmental causes among others because our employees, they don't just work in the region, they live here too.

And finally, continuing to invest. We are committed to continued investment at Pickering in many different areas. The station has always been safe. Nevertheless, in keeping with our drive for continuous improvement, we invested heavily in emergency mitigating equipment, EME, to make the plant safer than ever before. And as safe as the station is today, through the integrated implementation plan which has been accepted by the CNSC staff, we have committed to additional physical plant improvements

that will enhance nuclear safety to make the plant even safer going forward.

Commissioners, through the current power reactor operating licence which you have granted under your authority, I am privileged to hold the overall responsibility and I'm wholeheartedly committed to ensuring the safe and reliable operation of the Pickering station, but this responsibility and honour is not mine alone; it's carried and felt by personnel no matter where they work through all front line workers, supervision, leadership, support organizations, including our vendor partners, and up to the OPG corporate offices. This speaks to our nuclear professionalism and dedication to the job.

And to give you a sense of our passion at Pickering as nuclear professionals, we would like you to please watch the following short video.

--- Video presentation / Présentation Vidéo

It's not easy work, it's complex, it takes skill, focus, drive, intense training, knowledge and experience and it's unique, unlike any other industry.

We take natural uranium and use it to harness energy from one of the most powerful reactions in existence. We create nuclear power. We aren't

afraid of the challenge and never back down from one.

We have stamina, determination and perseverance.

Safety guides our every action. Quality is our ultimate goal.

We're proud of our contribution to the province. We're proud to uphold the trust of our community and we're proud to work in the nuclear industry.

We're powered by precision, we're driven by commitment and conviction.

We are nuclear professionals.

**MR. LOCKWOOD:** Commissioners, at the end of the day our request for licence renewal rests on the level of trust and confidence that you and the public have in our ability to safely operate the Pickering station; that we'll do things right, we will do them well and with high quality.

Trust and confidence is imparted by our staff as nuclear professionals. We always put public safety as top priority in everything that we do above all else. We also know that trust is earned. That's why we work hard each and every day to maintain our strong safety and performance record to give you, the public and ourselves the confidence and

reassurance in continued safe and reliable operation of the Pickering station.

Regarding our request of the Commission as outlined in the licence application, we are requesting a 10-year licence renewal for Pickering's power reactor operating licence. The licence renewal would encompass continued commercial operation of all units to the end of 2024, as well as transitioning of the units towards safe storage by 2028.

Associated with our submission is our request for Commission approval to operate fuel channels to 295,000 equivalent full power hours as this would correspond approximately to the end of 2024 for the lead unit.

Fuel channel fitness for service will be maintained and demonstrated throughout the operating period for all units.

With respect to the 10-year licence term, we consider it to be necessary, acceptable and appropriate for the following reasons. It's consistent with a timeframe that is normally associated with periodic safety reviews in Canada. It allows OPG to plan for all post shutdown, stabilization and safe storage activities that we need

to undertake. By having the licence conditions set in advance we can best plan for, execute these activities in an efficient and smooth manner and this can be accomplished using existing proven procedures as these types of activities are already licensed and were successfully carried out to place Units 2 and 3 in safe storage and recently used during the Darlington Unit 2 refurbishment.

A 10-year licence renewal aligns with the current licence term of the Pickering Waste Management Facility. When that licence expires, OPG plans to seek a single decommissioning licence for the site.

And lastly, a 10-year licence renewal provides regulatory certainty for continued baseload generation during the Darlington refurbishment and major component replacement at the Bruce site.

At this point I would like to briefly summarize our supporting case for Pickering licence renewal. Many more details have been provided in the materials submitted to the Commission in this regard and in the record.

It's important that we first reiterate the importance of Pickering in providing clean, safe, reliable and low-cost electricity for the people of

Ontario. And, as Mr. Lyash mentioned, Pickering is a significant supplier of Cobalt-60 which is a major benefit in medical and food sterilization applications around the world.

In producing electricity, we continue to protect the public, the workers and the environment. All of the OPG nuclear plants have had a long history of safe operation, including Pickering. And our staff have remained and will continue to be highly skilled, engaged and motivated in keeping Pickering operating well now and into the future through 2024 and during the safe storage period.

The Pickering plant has continued to evolve and improve over time meeting or exceeding regulatory requirements and applicable standards. As highlighted in our CMD and presentation for the Part 1 hearing, we have seen increasingly high levels of plant performance, some of the best in the history of the plant.

And as confirmed by our extensive periodic safety review, Pickering is in good condition today and the programs in place assure the plant is fit for service for continued operation through to 2024.

The plant is not the same as before

when it first began operations; it's better, actually it's far better. Through continued investments, Pickering has advanced to be safer than ever before and it will be even safer.

Furthermore, the first of a kind, Pickering's whole site risk assessment supports the overall safety case. The risk from Pickering is low.

Commissioners, for all these reasons and more, we proudly stand behind our licence renewal request and consider it to be a most compelling one.

I will now pass the presentation over to Mr. Steve Gregoris.

**NR. GREGORIS:** Steve Gregoris, for the record.

I'm the Deputy Site Vice-President for the Pickering Nuclear Generating Station.

In this part of the presentation, I would like to provide the Commission with some further clarifications on a couple of topics that were discussed at the Part 1 hearing last April. More details on these clarifications can be found in our Supplementary CMD for the present Part 2 hearing.

During the Part 1 hearing questions were raised on the relationship between emergency mitigating equipment, or EME, and the plant

modifications associated with the periodic safety review.

There were also some questions regarding the status of the Fukushima action items and status of EME implementation for Pickering. The following two slides serve to clarify these issues.

EME was a focus of OPG's efforts in response to the Fukushima event and in keeping with our commitment to continued investment.

At Pickering we have Phase 1 and Phase 2 EME. The EME is located and safely secured on site near to but separate from the station.

Phase 1 EME provides added defence-in-depth for fuel cooling. With Phase 1 EME pumps such as the ones shown in the top photo in this slide, water can be drawn from the lake and supplied to the heat transport systems, steam generators or calandria vessels of any Pickering unit using a variety of deployment routes. Any of these options provide an effective means to cool the fuel.

In addition, Phase 1 EME pumps can provide make-up water to the irradiated fuel bays to keep the used fuel cool and covered with water.

Phase I EME also includes portable generators and uninterruptible power supplies to power

instrumentation for monitoring.

OPG has gone further by implementing Phase 2 EME. These are larger generators, as shown in the lower photo in the slide.

Phase 2 EME strengthens containment strength in-depth, and can be used to re-power various equipment, including containment air coolers, hydrogen ignitors, and a filtered air discharge system which enables controlled and filtered venting at Pickering.

Both Phase 1 and Phase 2 EME implementation are complete. Phase 1 and 2 EME can be quickly connected to provide the necessary supplies of water and power. These are all in place at Pickering, available for service, tested, practiced and ready for deployment today.

Furthermore, all Fukushima action items have been closed since 2015. If ever needed, EME can be deployed virtually anywhere on site through many possible routes and by diverse means to provide emergency water and power to cool the fuel and protect containment.

With the robustness of the Pickering plant design and with the additional layers of defence in-depth from EME, we are confident that the potential for a large off-site release has been practically

eliminated.

At the Part I hearing, we described how OPG systematically conducted a periodic safety review. The PSR is separate from our work related to the Fukushima action items. The PSR is a part of our continual safety improvement efforts. It considered all aspects important to continue safe operation and concluded that the plant can be safely operated through to the end of commercial operation in 2024, and from the PSR process, OPG identified additional safety enhancements to further strengthen the already robust defence in-depth of the plant.

The PSR safety enhancements include various physical plant modifications. For instance, piping modifications will enable firewater addition to the Units 1 and 4 heat transport systems, steam generators and calandria vessels. These modifications will significantly bolster defence in-depth by providing even more diverse ways in addition to the as-built plant design and Phase 1 EME to cool the fuel and an extremely unlikely beyond design basis event. On top of all of the EME safety benefits, with the PSR safety enhancements, Pickering will be even safer in the next licence term.

At the Part 1 hearing, Dr. Binder, you

requested further information regarding the use of enriched uranium at Pickering. In accordance with the current Pickering operating licence, enriched uranium is used in the fission chambers of the shutdown systems for Units 1 to 4. The fission chambers support reactor power measurement and each fission chamber has a very small amount of enriched uranium in a form of a coated layer.

It should be noted that additional fission chambers are also used at Pickering by the IAEA as part of their safeguard system.

In summary, the amount of enriched uranium used at Pickering is very small and it is safely managed by OPG and the IAEA.

In the next few slides, we would like to summarize our perspective on the various written and oral intervention material that has been submitted with regard to Pickering licence renewal. Our supplementary CMD for the present Part 2 hearing contains more detailed discussion.

OPG staff have reviewed all of the available written and oral intervention material. We respect the views of members of the public and appreciate their interest in our operations. In fact, we encourage feedback from the public. It is an

important part of the licencing process and we see it as a reflection of our social licence.

We noted a large number of supportive interventions and we are thankful that people took the time to express their support. We also noted that some intervenors had a number of concerns, and we thank them too for taking the time to document their areas of concern. We see this as a mutual learning opportunity to discuss and provide clarifications.

Our review is focussed on identifying common areas of concern among the intervenors. The following slide provides further information and clarification on these topics.

I think it is appropriate to start this part of the presentation with reference to one of our six fundamental commitments; specifically, supporting transparency and engagement with the public as a few intervenors raised concerns with access to information.

In the spirit of transparency, OPG has been proactively and increasingly posting numerous documents on our public website. These include well over 5,000 pages of documentation related to licence renewal.

We received a significant number of

formal requests for information and OPG fully complies with freedom of information requirements. We also work diligently to respond as soon as possible to informal requests for information from the public.

In summary, OPG makes available to the public an abundance of information which can be and has been used as input for the preparation of the very interventions we will be discussing at this hearing.

A number of intervenors commented on the perception that Pickering is an old, outdated plant and that it is being unsafely operated past its design life. Well, we strongly disagree and would like to clarify that our strive for continuous improvement, adherence to high standards and adoption of best industry practices has insured the continued modernization and evolution of the Pickering plant to advance levels of safety.

As Mr. Lockwood mentioned earlier, the plant is not the same as when it first began to operate. Its design has continued to improve and advance over the years, to the point that the plant is safer than ever before with safety levels comparable to modern requirements for building a new plant.

Furthermore, OPG has in place a comprehensive aging management program which involves

periodic inspections, maintenance, testing, monitoring and technical assessments that confirm on an ongoing basis that the reactors are safe to operate, while meeting or exceeding CNSC requirements and CSA standards.

To give you an idea of the comprehensiveness of our studies, the PSR conclusions are based on condition assessments of over 500,000 components throughout the plant.

Fitness for service of major components is rigorously confirmed, including for fuel channels, feeders, steam generators and reactor components. OPG's programs have stringent requirements. As such, we would never operate the components if fitness for service cannot be demonstrated or if plant operating conditions are unsafe. We have confirmed through detailed technical studies that fitness for service of major components will continue to be assured through to the end of commercial operation at the end of 2024. The extensive PSR confirms this.

As well, it should be noted that the fuel channels in Units 1 and 4 are, in fact, relatively new as they were replaced in the late 1980s and early 1990s.

So to put this all into perspective, while an assumed design life was originally established for Pickering based on engineering knowledge at that time, today we know the station can be operated beyond that. This is consistent with typical engineering practice, which takes into account new and best available information.

Using the bridge analogy that was discussed at the recent Bruce Power hearing, an assumed design life of 50 years that is typically set for a bridge, does not mean the bridge is declared unsafe and torn down at the 50-year mark. Society continues to rely on the bridge, and provided the appropriate inspections, maintenance, testing and assessments are performed to ensure continued safety of the bridge, the bridge life span can be extended well beyond the assumed 50-year design life. The same, in principle, can be said for continued operation of a nuclear power plant. Indeed, this is precisely what is happening at several nuclear power plants around the world where their operating licences are being extended.

Finally, our commitment to continued investment and our drive for innovation are strategically aimed at supporting fitness for service

as this has a direct tie to safe and reliable operation.

A number of intervenors questioned our readiness for nuclear emergency and in particular in the event of a severe accident. This speaks to emergency preparedness and we fully understand the public interest in this topic.

It is a fundamental element in the defence and depth approach to public protection and is directly tied to our commitment to nuclear safety.

First, I would like to reinforce, as I indicated earlier, that Pickering has many robust and diverse barriers on site. These barriers focus on accident prevention and mitigation as a means to protect the public by ensuring that large off-site releases are extremely unlikely.

Nonetheless we have in place very robust emergency preparedness plans which are well integrated with off-site authorities. Our staff are trained on how to respond in the unlikely event of a nuclear emergency. Our emergency equipment is maintained, ready and poised and our plans are regularly tested.

For example, at the Part 1 hearing we described Exercise Unified Control, which was

conducted in December 2017. This major exercise demonstrated our collective readiness on a large scale internal and external to OPG.

We have an ongoing series of public communications on the topic of emergency preparedness to keep the public informed and prepared.

Public awareness sessions are held on an annual basis and OPG has worked with various government organizations on the predistribution of potassium iodide pills, or KI pills, to all residents, businesses and institutions within ten kilometres of Pickering Station.

Furthermore, KI pills are made available for people within 50 kilometres of the plant for anyone who wants them.

I would also like to note that OPG is in the process of aligning its plans with the Pickering Implementation Plan which was approved last March following issuance of the updated Provincial Nuclear Emergency Response Plan.

Some intervenors expressed concerns over environmental protection. Our perspective on this is detailed in the Supplementary CMD submitted for the present Part 2 hearing.

Our performance is strong in all areas

of environmental protection. We have in place effective measures to maintain a low risk of any impacts to the environment. Our Environmental Monitoring Programs in the vicinity of Pickering assess the impact of station operations on the environment and human health. Results are made available to our community and the public on our external website.

We not only meet environmental requirements but we go well beyond to protect the environment. For example, our targets for radiation dose to the public are much more stringent than regulatory limits and we strive to keep them as low as reasonable achievable.

The public radiation dose from Pickering remains a fraction of 1 per cent of the regulatory limit and negligible in comparison to natural background radiation levels.

We also take pride in our programs that nurture wildlife diversity and habitat. For instance, although the Peregrine Falcons can be found all over the world, only about 5 per cent of the world's population lives in Canada. One of these beautiful falcons is shown in this photo. We have welcomed two males and two females at Pickering. Our

urban nesting site has played an important role in helping this protected species slowly rebound.

We are also continuing to invest to protect the environment, for instance, through biodiversity and wildlife habitat programs and the ongoing salmon stocking program.

In addition, Fisheries and Oceans Canada issued a fish authorization for the Pickering Station and hence acknowledged the mitigating measures that are in place and planned for aquatic species. We view this as an endorsement of our efforts to protect an important sector of the environment.

Intervenors raised questions regarding OPG's nuclear waste management plans. OPG is committed to the responsible and comprehensive management of nuclear waste from Pickering, including low, intermediate and high level waste. Well established programs and plans are in place to support this.

It is important to stress that OPG has been safely storing radioactive waste at its separately licensed waste management facilities located at Bruce, Pickering and Darlington nuclear sites for over 40 years while meeting all environmental and regulatory requirements.

OPG continues to work towards providing long-term solutions for its radioactive waste in accordance with regulatory processes.

Turning to the topic of irradiated fuel bays, we noted that some intervenors questioned the condition and capacity of our irradiated fuel bays. As part of the Periodic Safety Review the condition and operation of the Pickering irradiated fuel bays was assessed. It was concluded that the irradiated fuel bays and supporting equipment are in good condition and able to support the station's spent fuel storage strategy.

Lastly we confirm that there is sufficient storage capacity in the irradiated fuel bays to support the station needs consistent with the scope of our licence renewal request.

I will now pass the presentation back to Mr. Randy Lockwood for closing comments.

**MR. LOCKWOOD:** Thank you. Steve.

Randy Lockwood, for the record.

To guide our everyday work at OPG we focus on OPG's strategic comparatives. These are operational excellence, project excellence, financial strength and social licence.

Our social licence to operate

Pickering is dependent on us meeting the expectations of the public, our neighbours, stakeholders and local indigenous communities. To do this, we focus on ensuring that we have a healthy, engaged and diverse workforce that delivers on our commitment for safe and reliable operations. We commit to openness and transparency and we ensure that our sustainability programs, our community outreach activities and indigenous relations program promotes public trust and confidence in our operations.

At OPG we are committed to gaining a greater understanding of indigenous people, their cultures and their traditional land use.

For example, the Pickering Station hosted National Indigenous People Day last week, an annual cultural celebration hosted by OPG's indigenous circle of employees that recognized the local Mississauga People and their history.

And each year OPG supports a number of indigenous community projects focused on youth, science, culture and sports.

We are also committed to building ongoing mutually beneficial relations with indigenous communities and with that in mind launched a program known as ION, Indigenous Opportunities in Nuclear.

This program will use the Darlington Refurbishment Project as a catalyst to hire indigenous people into both trades and non-trades roles with OPG, its vendors and building trade unions.

Today we have made it clear that we are committed to maintaining our social licence by focusing on continued safe operations at Pickering that ensure the protection of our staff, the public and the environment. But it is more than that and for me it is simple. The Pickering Nuclear Station is more than a station that just generates electricity. We care about the community. We actively work to make our community a better place to live and with the majority of our staff living in the Durham Region we are very much woven into the social fabric of this community and connected in many different ways.

We are connected through the ongoing public dialogue. We are connected through our work with local environmental organizations with whom we have a shared passion for fostering environmental stewardship. And we are connected through our work with more than 100 local community groups and not-for-profit organizations.

And thanks to the efforts of OPG staff there are various touchpoints with the communities

around the Pickering Station each and every day.

These connections with the community range from inspiring youth to become environmental stewards through our Bring Back the Salmon school partnership to creating what's known as the Jewel of the City by planting over 14,000 trees and shrubs in Alex Robertson Park with local scouting groups and other partners.

They include harvesting of food grown in OPG's garden plot for our local community food bank and helping seniors with seasonal yard maintenance.

For us it's about building partnerships with local community groups and organizations based on shared values to make our community a better place.

That wellbeing of our community matters to us and the feedback we hear from parents, teachers, students, community groups and other organizations is that OPG's efforts matter to them too.

I'm very proud when parents tell us that our free educational Tuesdays on the Trail Program is their child's summer, and it makes me equally proud when a local teacher participating in our Backyard Buddies Program writes to thank us for

helping her -- and I quote -- build good citizens.

And the teacher who wrote saying:

"It's inspiring to watch my students react to the salmon eggs grown in the Pickering Nuclear Salmon Hatchery released as salmon fry in Duffins Creek. We are so thankful for this partnership with you as our students never get opportunities like this." (As read)

And finally feedback from a family that said:

"Our experience this week with OPG's March Break Madness has been awesome!!" (As read)

Commissioners, in the week of March Break close to 4,500 people attended eight events we held over five days, with support from our community partners and local high school volunteers. And to me, that's what Pickering's social licence is all about.

It's this social licence that allows Pickering Mayor Dave Ryan to say that he's proud to be the Mayor of a community that generates 14 per cent of Ontario's electricity while adding value to our

community and to our province.

Me, I'm so proud to be able to say that OPG Pickering we're so much more than a station that generates electricity.

Commissioners, we have concluded, as described to you in our licensing submissions and during the Part 1 hearing, that OPG is qualified and capable of safely operating our Pickering station over the requested licence renewal term of 10 years. Pickering's performance and safety record offers you the comfort and confidence to grant us such a licence.

Over the 10-year licence period we will continue to supply clean, safe, reliable, low-cost power to the people of Ontario through to the end of commercial operation in 2024, and we will safely transition the station to safe storage by 2028. In doing so, we will continue to protect the public, workers and the environment while respecting our national security and international obligations.

To close, I would like to reflect on the last few community slides which we have shown you, and say that it's all about the people and the environment they live in. At OPG our social licence is about earning the trust, respect and confidence of the community and maintaining that trust going

forward. Simply put, we're part of this community and we care.

This extends to our people at the Pickering station, many of whom are shown in this photo. They proudly stand in support of our Pickering plant. Commissioners, it's important I feel, at the end of the day, to remember nuclear safety is ensured by people. We have pledged six fundamental commitments that are essential in supporting our licence request.

I say, who will deliver on these commitments? We will, the Pickering team, the best team in the industry. As a team we are committed and aligned to deliver on our mission to improve Pickering performance year over year such that our last day is our best day.

It's been both a pleasure and an honour to speak on behalf of OPG in support of our Pickering licence renewal. I thank you for your attention. We are prepared to answer any questions you may have.

**THE PRESIDENT:** Thank you. I'd like to move now to the presentation from CNSC Staff as outlined in CMD 18-H6.B and H6.C. Mr. Frappier, you may proceed.

**CMD 18-H6.B/18-H6.C**

**Oral presentation by CNSC staff**

**MR. FRAPPIER:** Thank you and good afternoon, Mr. President and Members of the Commission. For the record, my name is Gerry Frappier and I'm the Director General of the Directorate of Power Reactor Regulation at the CNSC.

With me today is Dr. Alex Viktorov, Director, Pickering Regulatory Program Division, and Ms Heather Overton, Senior Regulatory Program Officer of the same division.

Regulatory and technical staff from the CNSC are also present and available to answer questions the Commission may have. Some of our technical staff are in Ottawa and will respond via phone link.

This presentation complements CNSC staff's written submission found in supplemental CMD 18-H6.B.

I'll start with the purpose of the presentation.

The main purpose of our presentation

today is to communicate the summary of what we heard from intervenors, and to connect the issues raised by intervenors to the information presented to the Commission during the Part 1 hearing, or in separate Commission meetings.

We will provide a summary of OPG safety performance and will also update the Commission on a small number of developments that took place since the Part 1 hearing in early April.

The proposed Power Reactor Operating Licence and draft Licence Condition Handbook are attached to CNSC staff's supplemental CMD. We'll also discuss the changes that have been made to these two documents since the Part 1 hearing. At the end, we will present CNSC Staff's conclusions and recommendations.

The current power reactor operating licence for Pickering Nuclear Generating Station expires on August 31, 2018. OPG has requested the licence to be renewed for a period of 10 years.

In support of its request for a 10-year operating licence OPG conducted a Periodic Safety Review in accordance with CNSC regulatory document REGDOC-2.3.3. A PSR is a comprehensive evaluation of the design, condition and operation of a

nuclear power plant. The Pickering PSR was undertaken to confirm and enhance the safety case for continued operation of the Pickering plant.

Part 1 of the Pickering licence renewal hearing was held in Ottawa on April 4, 2018. In CMD 18-H6, CNSC Staff presented the Commission with the results of Staff's assessment of OPG's licence application. In addition, the CMD provided information regarding the CNSC oversight of Pickering safety performance over the current licence period.

OPG intends to cease commercial operation of Pickering NGS on December 31, 2024. Therefore, the requested licence period will cover three distinct phases: operation of the reactors on power until December 31, 2024; a stabilization phase that will last approximately 3 to 4 years; and, the beginning of safe storage.

During the stabilization phase, fuel will be removed from the reactor cores and placed in the irradiated fuel bays. Most systems will be drained and de-energized. The proposed licence and accompanying Licence Conditions Handbook set requirements and expectations for continued operation as well as for the transition from operation to the

safe storage state.

Staff recommendations regarding the licence renewal application are not based only on examining the application. During the current licence period, CNSC Staff performed varied compliance activities, and collected information characterizing safety performance of the facility. Around 7,000 person-days of effort is dedicated every year to the evaluation of safety performance of Pickering Nuclear Generating Station, mostly through inspections and technical assessments.

This slide tabulates Pickering safety performance ratings for the 14 safety and control areas during the current licence period. ~

In this slide, SA indicates a satisfactory rating and FS represents a fully satisfactory rating. As you can see, Pickering's performance has been satisfactory or fully satisfactory across all areas.

Changes in the performance rating in 2015 and 2016 were based on the outcomes of compliance oversight activities. The decreased ratings were due to specific inspection findings of non-compliance of limited safety significance which have since been corrected. Those were

discussed during the Part 1 hearing.

I will now pass the presentation over to Dr. Viktorov who will discuss the key intervenor concerns and the CNSC Staff's position.

**DR. VIKTOROV:** Thank you, Mr. Frappier. Good afternoon, my name is Alex Viktorov, for the record. I am the Director of the Pickering Regulatory Program Division.

In this part of our presentation we will summarize the main issues identified by intervenors with respect to the renewal of the Pickering operating licence, and CNSC Staff's responses to these issues. Many such issues were similar in nature which allowed us to group them into common themes, as will be discussed below.

The notice for the Commission hearing and the participant funding announcement were issued on September 29th last year. The deadline for submissions was on the 7th of May, 2018, with some intervenors requesting an extension for providing their submissions. A total of 156 submissions were received from private citizens, non-governmental organizations, and Indigenous groups.

Participant funding was made available to support the public participation. There were nine

participant funding recipients for these proceedings, and those recipients will be making their own presentations during this hearing.

Staff reviewed each of the interventions to understand the nature of the issues raised and to identify whether they contain new information related to the plant safety performance, its impact on the public, and the environment.

About half of the submissions either expressed objections to the licence renewal or contained certain reservations. The main themes of such interventions will be described in the subsequent slides.

The other half of interventions were supportive of the continued plant operation, highlighting the importance of the Pickering Nuclear Generating Station to the provincial and local economy, and emphasizing the safety record, continuously improving performance and many design and operational enhancements.

The main topics of the public interventions are summarized on this and the next slides.

The key issues raised in the interventions have been grouped by CNSC Staff

according to the CNSC safety and control areas. Primarily, intervenor concerns fell within the following areas: fitness for service; radiation protection; environmental protection; and, emergency preparedness.

A large number of questions related to handling of radioactive waste and the approach to decommissioning.

Also, several interventions dealt with: follow-up to Fukushima accident; protection of the containment integrity in case of a severe accident; as well as details related to the proposed licence period, the end of commercial operation, and opportunities for public involvement.

I'll now pass the presentation to Ms Overton, who will summarize the key issues raised by the intervenors and provide an overall context for the CNSC Staff position.

**MS OVERTON:** Thank you. It's Heather Overton, for the record. I'm a Senior Regulatory Program Officer in the Pickering Regulatory Program Division.

The issues related to aging impacts primarily focused on fuel channels and feeders. Notably, questions have been raised, as in the past,

about the operation of the pressure tubes above 210,000 effective full-power hours.

Recognizing the significance of this subject, in January of this year CNSC Staff presented to the Commission detailed information on fuel channel fitness for service requirements, evaluation methodologies, and CNSC oversight activities.

This presentation is included as an appendix with the supplemental CMD 18-H6.B.

Given the importance of the condition of systems, structures and components for safe operation, OPG conducts regular inspections and assessments and CNSC staff independently verify conclusions from such activities to confirm that applicable requirements continue to be met. Furthermore, CNSC staff reviewed OPG's condition assessments and aging management reports submitted as part of the periodic safety review. These assessments confirmed that OPG has capacity to maintain the fitness for service of systems, structures and components important to safety. OPG and the industry continue research activities to enhance the current understanding of aging-related degradation mechanisms that could affect the operation of Pickering fuel channels.

To summarize, OPG has in place adequate provisions to assure fitness for service of major components, including fuel channels and feeders. OPG has adequate capabilities to assess, verify and manage the aging of these components through the remaining operational life.

The licensee must continue to demonstrate to the CNSC that fuel channels are fit for service considering all degradation mechanisms to allow the continued operation of the units.

This slide shows the current values of the effective full power hours as of April 30th, 2018, as well as values of the effective full power hours predicted at the end of commercial operation. Also shown are the hydrogen equivalent concentrations, or Heq, at the critical channel locations. The expected values of the Heq are not predicted to exceed the range of model applicability. The number of effective full power hours is indicative of the overall aging effects, while hydrogen concentration relates to the critical characteristics such as fracture toughness of pressure tubes.

CNSC staff are confident that pressure tube condition is well known, aging impacts are controlled and adequate measures can be taken should

the safety margin degrade. This confidence is based on the following.

First, degradation mechanisms of pressure tubes are well understood by industry and CNSC, including the limiting phenomenon of hydrogen uptake by the pressure tube material.

Second, OPG has a comprehensive inspection and monitoring program in place specifically to monitor the Heq values.

And third, a robust regulatory oversight process is in place to ensure that the licensee will meet its commitments.

Comments were put forward by some interveners concerning the potential health risks associated with exposure to low doses of radiation either during normal operation or following accidents. While some interveners feel that the risks are underestimated, others are concerned they are being overestimated. This subject has been raised in previous Commission proceedings.

To address this longstanding debate, in November of 2017, CNSC staff presented to the Commission on the topic of biological mechanisms acting at low doses of radiation. CMD 17-M46 presented staff's update on the current scientific

understanding of the health risks from exposure to low doses of radiation. CNSC staff concurred with the view of the scientific community that if there was any increased risk of cancer at low doses of radiation, the risk would be small and not observable. Health risks from low doses of radiation are further minimized by the application of the "as low as reasonably achievable", or ALARA, principle.

CNSC staff concluded that the current Canadian radiation protection regulatory framework is robust and protects workers and the public. This framework is informed by a radiation dose response model known as the linear non-threshold model. This model remains the best model on which to base the dose limits defined in the *Radiation Protection Regulations* as it is consistent with data over a wide dose range and provides a conservative estimate of risk.

Many interventions dealt with the environmental impacts from the operation of the Pickering Nuclear Generating Station, including the issue of the comprehensiveness of an environmental assessment, or EA, under the *Nuclear Safety and Control Act* compared to an environmental assessment under the *Canadian Environmental Assessment Act*, or CEAA, 2012.

Under the *Nuclear Safety and Control Act*, the CNSC has a legislated mandate to ensure the protection of the environment and the health and safety of persons. If a project such as this licence renewal is not included on the project list under CEEA 2012, the CNSC undertakes an environmental assessment under the NSCA. The core scientific bases used in the NSCA EA are as rigorous as those of CEEA 2012. However, the processes are different.

The CNSC EA report is produced using a number of different sources, the most important of which are shown on the right side of this slide. These sources provide up-to-date information required for the environmental assessment. An added benefit of an EA under the NSCA is that it is part of the ongoing regulatory and environmental oversight of all nuclear facilities in Canada and in this way allows incorporation of new knowledge and best practices.

CNSC staff's environmental assessment concluded that OPG has made and will continue to make adequate provisions for the protection of the environment and the health of persons.

A few interventions commented on the current guidelines for tritium in drinking water. This issue has also come up at other hearings. In

2007, CNSC staff initiated the Tritium Studies Project to enhance the information available to guide regulatory oversight of tritium processing facilities and tritium releases in general. The project included a study of existing standards and guidelines for tritium in drinking water and examined the basis for the Canadian federal drinking water guidelines of 7000 Bq per litre. The Canadian guideline is based on the recommendations of the International Commission on Radiological Protection and the World Health Organization and is consistent with the criteria adopted by many countries.

A recent update on the Tritium Studies Project was provided to the Commission in November of 2017 in CMD 17-M48. Based on the Tritium Studies Project, CNSC staff maintain that adequate provisions have been made through the current regulatory mechanisms for the protection of Canadians from exposure to tritium releases.

Results from the 2017 Pickering Environmental Monitoring Program showed that tritium levels at all water supply plants are well below the 7000 Bq per litre provincial limit and even below the Ontario Drinking Water Advisory Council's recommendation of 20 Bq per litre. The results

support the conclusion that the dose to members of the public due to exposure from tritium releases is a small fraction of the regulatory dose limit.

Another issue related to environmental protection involves tritium in groundwater. In particular, several interveners felt that insufficient information had been provided about the concentration of tritium in groundwater within the Pickering site.

In accordance with regulatory reporting requirements, OPG annually submits a Pickering groundwater monitoring results report. According to the 2017 annual report, groundwater samples were collected from 132 sampling points. Groundwater samples were analyzed mainly for tritium. However, select samples were also analyzed for other non-radioactive contaminants.

The results show that tritium concentration trends over time at most monitored locations have remained nearly constant or decreased. However, at the Unit 5 and 6 reactor building areas, elevated tritium concentrations in groundwater were identified starting in 2016. OPG conducted an investigation and determined the source of the elevated tritium was due to leakage from the Unit 5 moderator room through construction joints in the

foundation slab. The construction joints were subsequently resealed and tritium concentrations in the Unit 5 ground tubes have since declined significantly. A similar investigation and repairs have recently been completed at Unit 6. CNSC staff have initiated regulatory actions to ensure that the root causes of the situation are addressed.

Elevated tritium concentration in groundwater is mainly localized within the station's protected area, with no groundwater flow to Lake Ontario from this area. The monitoring confirmed that at the site perimeter concentrations of tritium and groundwater remain low, indicating no offsite impacts.

Many interveners identified emergency preparedness as their primary area of concern. In general, the issues relate to consistency of national and international standards for emergency preparedness and the adequacy of provisions under the Provincial Nuclear Emergency Response Plan.

With respect to the licensing basis framework for emergency preparedness at Pickering, CNSC staff verified and confirmed that Pickering Nuclear Generating Station meets the regulatory requirements of REGDOC-2.10.1 for emergency preparedness, plans, procedures and equipment. The

requirements and guidance in REGDOC-2.10.1 are based on and consistent with modern national and international practices, in particular those of the IAEA.

The Canadian requirements establish a modern risk-informed approach which considers a full spectrum of possible events, including events of greatest consequence to the public. CNSC staff also confirmed that Ontario's Provincial Nuclear Emergency Response Plan conforms to CSA Standard N1600 and IAEA document GSR-7.

CNSC requires demonstration that the likelihood of accidents with serious radiological consequences is extremely low, with an emphasis on prevention and mitigation of severe accidents. Regardless, following the Fukushima accident, improvements were implemented at all the nuclear power plants in Canada, including Pickering, to enhance capabilities, to respond in case of an unlikely severe or multi-unit accident.

The Provincial Nuclear Emergency Response Plan was updated in 2017 to reflect the most recent developments in national and international standards. A provincial discussion paper was released to the public in 2017 and the comments were disposed

by a special advisory group. The planning zone sizes were confirmed with an addition of the contingency planning zone out to 20 kilometres.

The current Provincial Nuclear Emergency Response Plan recommendations for thyroid blocking protective action levels also align with international guidance. As well, the Provincial Master Plan has now been supplemented by the Implementing Plan for Pickering Nuclear Generating Station.

The Commission heard a comprehensive update on the recent changes in the Provincial Nuclear Emergency Response Plan provided by the Ontario Office of the Fire Marshal and Emergency Management on the 4<sup>th</sup> of April of this year in CMD 18-M21.

For illustration, this slide is showing the detailed planning zone which extends out to 10 kilometres from the site and the new contingency planning zone in the 10-to-20-kilometre zone from the station. Not shown in this diagram is the ingestion planning zone which extends out to 50 kilometres from the station.

Several interventions commented on waste management and decommissioning plans. Broadly, there were four issues identified: the

comprehensiveness of the Canadian regulatory framework for nuclear waste in decommissioning; the strategy and location for long-term and permanent disposal of OPG's radioactive waste; the robustness of current onsite waste storage facilities; and the financial and social impacts of delayed decommissioning on current and future generations.

The CNSC's regulatory approach to radioactive waste is based on the *Nuclear Safety and Control Act* and is articulated in CNSC regulatory documents. These regulatory documents draw upon and are consistent with recommendations of the IAEA and best practices from the international and national communities.

The Government of Canada's Radioactive Waste Policy Framework sets the stage for institutional and financial arrangements to manage radioactive waste. The framework recognizes that long-term management arrangements may be different for various categories of radioactive waste such as used nuclear fuel and low and intermediate level radioactive waste.

The federal government is responsible for developing policy and for regulating and overseeing radioactive waste producers, while the

licensee is responsible for funding, organization, management and operation of the facilities required to safely manage their waste over the short and long terms.

The next two slides provide a breakdown of the amount of nuclear waste on the Pickering site.

This table shows the amount of high-level radioactive waste or used nuclear fuel, including current and projected to the end of commercial operation. The projected numbers were independently calculated by CNSC staff. These numbers are approximate and may change depending on the actual operating conditions.

In 2007, the Government of Canada selected the Adaptive Phased Management Approach developed by the Nuclear Waste Management Organization for the safe and secure long-term management of used nuclear fuel. The activity is presently in the site selection stage for siting a deep geological repository.

This slide provides the current and projected inventories of intermediate and low level waste stored on the Pickering site. Intermediate and low level waste is primarily stored at the Western

Waste Management Facility in Tiverton, Ontario. With regards to low and intermediate level radioactive waste, OPG has recognized that a permanent solution is required to safely dispose of such waste. The current project proposed by OPG is to prepare the site and construct a deep geological disposal facility on the Bruce site.

Note that waste management facilities possess their own operating licences which are separate and independent from the power reactor operating licence. The CNSC renewed the Pickering Waste Facility licence in April of 2018 for a ten-year period.

Regarding the third issue, the robustness of current onsite waste storage facilities, the safety analysis for these facilities takes into account potential malevolent acts and natural hazards and are submitted to the CNSC staff for review and acceptance on a five-year basis. Used fuel is categorized as Category II nuclear material in accordance with the *Nuclear Security Regulations* and the *International Convention on the Physical Protection of Nuclear Material*.

Licensees that store Category II nuclear material within their nuclear facility must

have adequate security measures in place. CNSC staff verify that the used fuel generated at Pickering Nuclear Generating Station is safely and securely stored at the Pickering Waste Management Facility sites within protected areas. All nuclear material processed, stored and transported by OPG is protected in accordance with regulations.

Finally, regarding the issue with delayed decommissioning and financial and social impacts, the CNSC requires that planning for decommissioning takes place throughout a facility's lifecycle. A preliminary decommissioning plan, or PDP, is in place for the Pickering Nuclear Generating Station, with the latest revision approved by the Commission in 2017. In the PDP, OPG selected a deferred decommissioning strategy to allow for radiation levels to decay prior to station dismantling and demolition. The dismantling and demolition stage is expected to begin around 2050 and decommissioning is expected to be completed in 2065.

The PDP also serves as the basis for the decommissioning cost estimate, which in turn is used to determine the amount of the financial guarantee that OPG must have in order to ensure that sufficient funds are available to decommission the

facility. OPG maintains a consolidated financial guarantee for all of the nuclear facilities it owns. As of December 31st, 2017, this financial guarantee was valued at about \$21 billion, which exceeds the minimum required amount of approximately \$16.5 billion for 2018.

I will now pass the presentation back to Dr. Viktorov who will continue discussing other issues identified by interveners.

**DR. VIKTOROV:** Thank you.

Once again it's Alex Viktorov, for the record.

Many interveners made reference to the 2011 Fukushima accident and expressed concerns with Pickering's ability to cope with accidents due to its age and design. Following the Fukushima accident, CNSC established an action plan to ensure that essential lessons were applied in Canada to enhance the safety of all nuclear facilities. All Fukushima action plans have been completed.

OPG has implemented many design modifications and safety upgrades at Pickering which have substantially reduced the likelihood of severe accidents as demonstrated by probabilistic safety analysis. CNSC staff CMD 17-M64 was presented at the

Commission meeting in December of last year to provide to Commission Members and the public the results of the probabilistic safety analysis for the whole Pickering site. Those results show that the site, that is aggregated for all units, core damage frequency and the site large release frequency are less than the safety goal established for a single unit. Examples of safety enhancements are listed on this slide.

The Fukushima action plan enhancements have resulted in increased containment robustness.

The Periodic Safety Review Integrated Implementation Plan will further bring improvements in the planned defence in depth. Given the multiple engineering provisions to protect the physical barriers at Pickering, a severe accident will be prevented or stopped within calandria, thus alleviating any challenges to containment. In the unlikely case where a severe accident progresses further, venting will be controlled and filtered.

In the PSR Integrated Implementation Plan, an additional modification dealing with assuring an alternative venting pathway is scheduled for completion by June 2019. Additional measures will further reduce the likelihood of an accident happening

or progressing to challenge the containment integrity.

The last issue that I will discuss relates to the proposed 10-year licence and the end of commercial operations for Pickering.

As mentioned earlier, OPG conducted periodic safety review supporting the licence renewal application and covering a ten-year period. On this basis, and given that placing reactors in a shutdown state doesn't pose new or increased safety risks, CNSC staff consider a ten-year licence duration to be in line with the requirements and best practices.

Nevertheless, CNSC staff recognize that the approaching shutdown and transition to safe storage will require special licence provisions. The proposed licence contains a site-specific licence condition 15.4. Should OPG decide it will be required to operate any unit beyond December 31st, 2024, this licence condition will stipulate that OPG notifies the Commission of its intent to operate any unit beyond this date. As this would constitute a change in the licensing basis, the Commission's approval will be required.

In addition, licence condition 15.4 requires OPG to implement and maintain plans for the end of commercial operation, namely, a sustainable operations plan covering activities prior to the shutdown and a

stabilization activity plan covering activities following the shutdown.

CNSC staff report annually to the Commission on performance of nuclear power plants through their regulatory oversight report at the public Commission meeting. This will offer an annual opportunity for the public to provide input to the Commission.

Finally, I would like to provide an update on some developments that relate to the relicensing process.

First, during the part 1 hearing, the Commission heard about the Pickering environmental risk assessment and the clarification that was being sought from OPG regarding some of the report's conclusions. Following the part 1 hearing, a discussion was held between OPG, CNSC, and Environment and Climate Change Canada, whereby OPG was able to provide the additional clarification to the satisfaction of both regulators. As a result, there are no outstanding regulatory concerns with regard to the environmental risk assessment for the Pickering site.

Also in April, CNSC accepted the changes to the derived release limits and environmental action levels covered in the licensing basis. OPG is expected to implement these changes by January 1st, 2019, and the licence condition handbook will be updated accordingly.

With regards to the emergency preparedness, the Pickering implementing plan has been updated following the 2017 revision of the Provincial Nuclear Emergency Response Plan and is now available on the Office of the Fire Marshal and Emergency Management website. The implemented plan applies the principles, concepts, and policies contained in the master plan in order to provide detailed guidance and direction for dealing with emergencies at the site.

Lastly, the observations and lessons from the Unified Control emergency exercise were summarized in several reports. This emergency exercise, simulating a response to a severe accident, was conducted in December 2017 and involved over 30 organizations on the federal, provincial, and municipal levels. The recently completed evaluation by OPG, CNSC, and independent experts concluded that the capability to respond to an emergency at Pickering Nuclear Generating Station meets their requirements and is adequate to protect the health and safety of the public.

Next I will summarize the changes to the proposed power reactor operating licence and the licence condition handbook that have been made since the part 1 hearing in April.

As detailed in CNSC staff's CMD 18-H6, presented at part 1 hearing, OPG is seeking Commission

approval to operate Pickering unit 5 to 8 fuel channels up to 295,000 effective full-power hours. This is the maximum operating time expected for the lead unit before the end of commercial operation on December 31st, 2024.

One of the principle factors influenced is the pressure tube material properties is the hydrogen-equivalent concentration or Heq. Based on the current Heq predictions, the lead Pickering channels are not expected to reach 120 parts per million before the end of the target service life in any unit. This concentration represents the upper validity limit for the approved pressure tube fracture toughness model. Regardless, CNSC staff have recommended a specific licence condition to assure the presence of adequate compliance verification criteria should the projected Heq predictions exceed 120 parts per million before the end of pressure tube target service life.

For consistency with the recommendation made by the Commission to CNSC staff during the Bruce Power licence renewal hearing, CNSC staff have subsequently strengthened the language in licence condition 15.3. Additional clarification has also been incorporated in the Licence Condition Handbook. This modification does not change CNSC staff recommendation that the Commission approve the operation of Pickering unit 5 to 8 fuel

channels up to a maximum of 295,000 effective full-power hours.

CNSC staff also updated the text in the draft Licence Condition Handbook. This included both technical and administrative changes as outlined in supplemental CMD 18-H6.B. None of the proposed changes constitutes relaxation in the regulatory oversight requirements. The updated draft LCH is also touched in the supplementary CMD for the Commission's information.

I will now hand over the presentation back to Mr. Frappier, who will conclude staff's presentation with summary of our conclusions and recommendations.

**MR. FRAPPIER:** Thank you, Alex.

Gerry Frappier, for the record.

The CNSC staff conclusion and recommendations provided in CMD 18-H6 remain the same. Namely, the CNSC staff conclude with respect to paragraph 24(4) of the *Nuclear Safety and Control Act* that the OPG is qualified to carry on the activities authorized by the licence and will, in carrying out that activity, make adequate provisions for the protection of the environment, the health and safety of persons, and the maintenance of national security in measures required to implement international obligations to which Canada has agreed.

CNSC staff recommend that the Commission

accept CNSC staff's conclusion and exercise its authority under the *Nuclear Safety and Control Act* to renew the licence to authorize OPG to carry out the activities listed in part 4 of the licence from September 1st, 2018, to August 31st, 2028.

It is also recommended that the Commission authorize OPG to operate Pickering units 5 to 8 fuel channels up to a maximum of 295,000 effective full-power hours.

With respect to licence condition 3.2, CNSC staff recommend the Commission delegate the authority for consent to restart a reactor after a serious process failure to the following CNSC staff: the director, Pickering Regulatory Program Division; the director general, Directorate of Power Reactor Regulation; and the executive vice-president and chief regulatory operations officer, the Regulatory Operations Branch. This delegation of authority would remain unchanged from the current licence.

Furthermore, CNSC staff recommend that the Commission accept the standardized and station-specific conditions included in the proposed licence. The six licence conditions specific to Pickering Nuclear Generating Station require OPG to implement the integrated implementation plan; maintain units 2 and 3 in safe storage

state; before hydrogen equivalent concentrations exceeds 120 parts per million, demonstrate that pressure tube fracture toughness will be sufficient for safe operation beyond 120 parts per million; implement and maintain plans for the end of commercial operation; implement and maintain a cobalt-60 program; and limit the activities of import and export of nuclear substances to those occurring as contaminants in laundry, packaging, shielding, or equipment.

Thank you, Mr. President and Members of the Commission. We are prepared to respond to any questions you may have regarding this presentation.

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

We're going to take a short break, come back at 3:45. Thank you.

--- Upon recessing at 3:22 p.m. /

Suspension à 15 h 22

--- Upon resuming at 3:47 p.m. /

Reprise à 15 h 47

**MR. LEBLANC:** Thank you. We'll now move to the interventions.

Before we start, I would like to remind interveners appearing before the Commission that we have

allocated 10 minutes for each oral presentation. I would appreciate your assistance in helping us to maintain that schedule.

Your more detailed written submission has already been read and will be duly considered.

There will be time for questions from the Commission after each presentation, and no time limit has been ascribed for the question period.

To help you in managing your time, a timer system is being used. The light will turn yellow when there is one minute left and will turn red at the 10-minute mark.

Mr. President.

**THE PRESIDENT:** Thank you, Marc.

The first presentation is by the Society of United Professionals, as outlined in CMDs 18-H6.73 and H6.73A.

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

**CMD 18-H6.73/18-H6.73A**

**Oral presentation by the  
Society of United Professionals**

**MR. CHATOOR:** For the record, my name is Ralph Chatoor.

Good afternoon, President Binder and members of the Commission.

I'm a unit director of the Society of United Professionals, formerly known as the Society of Energy Professionals.

Accompanying me to my left is Ms Julie Bartley, a delegate from the OPG local, to my right is Ms Rebecca Caron, a unit director of the OPG local, and to my extreme right is Mr. Joe Fierro, vice-president of the OPG local executive committee.

The society appreciates the opportunity to speak in support of Pickering Nuclear Generating Station's application to renew its four-reactor operating licence.

As a significant stakeholder in Ontario's nuclear industry, the society has intervened in past CNSC licence hearing and commented on proposed CNSC regulations.

In this presentation, we'll be commenting on the following areas: nuclear safety, labour relations, emergency preparedness, conventional and radiological

safety, environmental protection, employee involvement and engagement, and social licensing.

The Society of United Professionals represents more than 8,300 employees from many different professional backgrounds working for 14 employers, primarily in the energy and legal industry in Ontario. Approximately 4,400 society members are employed in the nuclear sector, with Pickering having approximately 1,200 members. All members at Pickering are employed as first-line managers and supervisors, control room shift supervisors, simulator trainers and examiners, professional engineers, scientists, environmental advisors, information system professionals, economists, auditors, accountants, and many other professionals.

As a union, we stand behind our members' professionalism, their integrity, and their commitment to excellence in all areas, particularly workplace health, safety, public health and environmental protection. Our members bring a strong independent voice to these matters.

Nuclear safety. At Pickering Nuclear, our members provide technical expertise in many areas, including that of nuclear safety. We have consulted with those members who have worked on key elements of the periodic safety review and probabilistic safety assessment. They are confident in the rigour with which these

assessments were done, and we stand behind the accuracy and integrity of their reviews.

The society accepts CNSC staff's recommendation to operate fuel channels up to a maximum of 295,000 effective full-power hours. We believe that the underlying models, plans, inspections, policies and procedures required to support this recommendation are in place.

Labour relations. The society remains resolute that the heart of safe and reliable operations is the requirement to have a sufficient number of adequately trained permanent employees in possession of required knowledge and skills to operate the plant safely and reliably until such time as the station closes.

In anticipation of the end of commercial life in 2024, it is imperative that adequate funding be maintained, accompanied by a well-thought-out staffing plan. A robust staffing plan ensures that employees at Pickering Nuclear clearly understand what will happen to them when the plant winds down and eventually closes.

Employee involvement and engagement. There has been improvement in plant performance during the last licensing period, in part due to the contribution, commitment, and engagement of all members in all facets of plant operation. Our members' focus on improving

operations of the plant is based on globally-accepted best practices for the industry. The presence of a robust nuclear safety culture in the workplace ensures that safety is not compromised by production parities.

The society has heard consistently from our members that safety is an overriding priority, above schedule, cost and production.

Emergency preparedness. Since the inception of the emergency preparedness program at Pickering Nuclear, all members report that a significant evolution has been made by the licensee in education and coordinating emergency preparedness in the community.

On December 2017, Pickering Nuclear conducted an emergency planning exercise titled "Exercise Unified Control". The exercise simulated a severe accident and tested the licensee's ability to respond to extreme events, including the use of portable emergency mitigation equipment, and connection points added post-Fukushima accident. This endeavour brought together 30 organizations from among different government agencies and regional organizations who participated in the exercise. Society members who were involved in the exercise expressed confidence that the agencies who participated can now better collaborate and communicate with each other.

Our members further advise that emergency safety is being taken seriously as the licensee has been consistent in its efforts to educate the public on such matters. It launched a website, distributed potassium iodide pills, and has a public alerting system available to residents within 10 kilometres.

Conventional safety. Our members are embedded in the workplace, and act as an additional safeguard of the public trust at Pickering Nuclear, and indeed all of Ontario's nuclear operations. Arguably, there is no one who can claim to have a higher stake in the safe operation of our nuclear stations than our members and their families.

Research shows that safety goals are enhanced by the presence of unions in the workplace as employees are more forthcoming in reporting low-level safety incidents. Our independent voice in all aspects of health and safety is manifested by our participation in multiple tripartite committees for both conventional and radiological safety in the workplace.

Radiological safety. In addition to conventional safety risks, our members are exposed to ionizing radiation hazards. Society members who work in radiation protection occupations pride themselves on their ability to routinely exceed regulatory standards. Our

radiation protection professionals maintain the worker doses as low as reasonably achievable by using best practices during radioactive work performance.

It is important to note that over the current licensing period no worker or member of the public received radiological doses in excess of regulatory limits, and all radiological releases were below regulatory limits.

Many of our members not only work but live in the immediate surroundings of the nuclear station and as a result have a vested interest in protecting their families and the environment from any ill effects arising from the operation of the plant. These members boat, surf, fish and spend time on many local beaches with their families. With this in mind, our members will be quick to identify concerns and have little hesitation in bringing these matters to the attention of station management, the responsible regulator or union representatives.

We are satisfied that Pickering Nuclear executes a comprehensive environmental monitoring program following the ISO 14001 standard.

Diversity and inclusion. The society takes pride in having a diverse membership where individuals can leverage all facets of their uniqueness when they report to work. We believe that diversity in the workforce is a strength that unlocks innovation by creating

an environment where individuals are encouraged to table novel ideas, and ultimately contribute to health, safety, and a robust nuclear safety culture.

At Pickering Nuclear, members who are appointed on the diversity and inclusion tripartite committees work in concert with our brothers and sisters at the PWU and management to remove barriers for those who face systemic discrimination.

Social licensing. The commitment of our members goes beyond their duties at work, as there is a strong sense of community at Pickering Nuclear. Our members recognize the importance of giving back to the host community by engaging in a variety of activities that raise funds to support many causes and groups in the community.

In summary, the society believes that Pickering Nuclear plays an important social utility role, and does so in a manner that is safe, reliable and respectful to the environment. Moreover, adequate provisions have been made to protect the public and its workers.

In conclusion, the society is proud of the contributions which our members have made over the past 40 years at Pickering Nuclear. In this spirit, we are committed to maintaining our independence while subscribing to nothing but the highest standards in the workplace.

In conclusion, the society supports the application for a 10-year operating licence for Pickering Nuclear.

The society wishes to thank the Commission for granting leave to appear and make this oral presentation.

We will now be open to any questions the Commission may have.

Thank you.

**THE PRESIDENT:** Thank you.

Questions?

**MEMBER LACROIX:** Yes, indeed, I do have a question. Thank you, Mr. President.

Thank you for your presentation.

You're in the process of negotiating a new collective agreement with OPG right now.

**MR. CHATOOR:** That is correct.

**MEMBER LACROIX:** My question concerns nuclear safety. You're negotiating a new agreement under very special circumstances, unusual circumstances. You know that the plant will close in 2024. In any negotiations, there's always friction and disagreements. Could this lead to a breach of safety or could it jeopardize safety in the long run?

**MR. CHATOOR:** I'll pass that question to Vice-President Fierro.

**MR. FIERRO:** Joe Fierro, for the record.

As the local vice-president, I am leading the bargaining currently under way. On a daily basis, I interact with members. Our members are, first and foremost, professionals. They take the job seriously. They act professionally. We do not have a strike-lockout paradigm for collective bargaining. We have a mediation/arbitration at the end of the process, so it generally behaves well and respectful. We don't have incidences where we might act up as a sign of protest. That has never happened before and we don't expect it to happen any time.

I'm hoping that we'll be able to have a successful bargaining with OPG and prepare a collective agreement that helps us move forward in dealing some of these -- tackle some of these difficult issues that are ahead of us.

**MEMBER LACROIX:** Okay. Thank you.

Thank you.

**MEMBER VELSHI:** Thank you. I was intrigued with reference in your written submission to a formal process you have called Resolution of Deferring Professional Opinions when you have

different technical opinions.

Can you give us examples of the kinds of differences in technical opinions that have triggered a process like that, and particularly any that may have had anything to do with nuclear safety?

**MR. CHATOOR:** Ralph Chatoor, for the record. I just want to underscore my opening statement by saying that this particular procedure that you refer to is part of our annual training that we have to undergo every year.

Our members are advised -- not members, employees are advised that should you have a difference of opinion in the way that -- it's part of nuclear safety culture in the way that items are being dispositioned. You have the right to raise an SCR and the matter is then evaluated.

In terms of specific examples of how matters are being dispositioned with the use of that procedure, I don't have any because matters are often resolved on a lower level between line managers and staff, but individuals can avail themselves of that procedure.

**MEMBER VELSHI:** Well, let me ask OPG. Have there been examples where this process has been triggered on a nuclear safety issue?

**MR. GREGORIS:** Steve Gregoris, for the record. I'm going to ask Jason Wight, our Director of Engineering, to speak specifically to this issue.

**MR. WIGHT:** Jason Wight, Director of Engineering for Pickering Nuclear, for the record. I can't think of any on hand with regards to nuclear safety.

Normally this process is used, for example, if there's a difference in a procedure or code. For example, there might be a CSA code standard, we're applying it differently. If the individual feels strongly about it and they can't get resolution within line management, we'd follow this process to make sure that their concerns are addressed and it's very important for us that their concerns are addressed.

That's normally where we'd see this process being used. It's used very rarely, but it is a good example of where a nuclear safety culture is used.

**THE PRESIDENT:** Can I piggyback on that? So, on the intervention, page 16, you list all the committees you're on: Joint Health and Safety Committee, Joint Working Committee, Tripartite Advisory Committee, Joint Committee on Radiation

Protection.

Give us a flavour of, are there any outstanding issues?

**MR. CHATOOR:** Ralph Chatoor, for the record. I will pass it on to Rebecca Caron.

**MS CARON:** For the record, Rebecca Caron. So, with regards to the Joint Working Committee, which is one of the ones that we work with management, we will sit and bring issues and have open discussions and attempt to resolve them at that level.

We also participate in the Joint Radiation Protection Committee for which we raise issues, management brings new initiatives. We also discuss changes in regulations.

So, they're a very open and honest relationship between management and the unions that participate to bring forth issues and have discussions and there are processes in which that we can use to resolve issues if we can't come to a resolution at those meetings.

**THE PRESIDENT:** So, how often -- I'm trying to figure out, if it's such a wonderful process maybe we can adopt something out of this. Just tell us, how do you resolve professional disagreements?

**MS CARON:** Through discussion,

generally speaking, or a lot of our members involved in some of the procedural changes and work with management in order to bring those to fruition.

Does that answer your question?

**THE PRESIDENT:** So, you're happy there's nothing outstanding that's not been addressed that you -- any issue that you raise always get addressed?

**MS CARON:** None that I've specifically raised have not been left unaddressed, that is correct.

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

Mr. Berube?

**MEMBER BERUBE:** You obviously have a lot of people in your membership. How many people actually work at the plant?

**MR. FIERRO:** Joe Fierro, for the record. There's approximately 1,200 at Pickering and approximately 900 at Darlington, including Darlington refurb.

**MEMBER BERUBE:** So, we've adequately discussed here quickly the safety implications. I'm also worried about the security implications. Are there any concerns on behalf of your organizations about the security provisions at Pickering? Has that

ever come to light and how do you deal with those?

**MR. FIERRO:** Joe Fierro, for the record. We believe that security at Pickering is better now than it's ever been. There are armed and unarmed guards, there is barriers and there's scanners, there is all types of awareness where people are keeping an eye out and reporting things they see that are unusual. There's people observing the parking lot. There's cameras.

I believe security at Pickering is very good in observing everything that's going on.

**THE PRESIDENT:** Thank you. Ms Penney?

**MEMBER PENNEY:** Thanks for the presentation.

A question I guess for OPG really around, as you move towards the end of commercial operations it's been suggested that there be an appropriate staffing plan. What's the progress towards that for this licensing period?

**MR. GREGORIS:** Steve Gregoris, for the record. So, we currently have a detailed staffing plan that is in place. It's a 10-year look forward for each of the different disciplines. That is run through a resource planning and control team for all of nuclear.

In that plan we look at staffing demand and staffing requirements. We make sure there's adequate hiring, there's adequate training, adequate mentoring, knowledge and retention programs to ensure that we maintain staff qualified, competent and engaged.

On top of that, for Pickering end of commercial operations, in our preliminary decommissioning plan we've shown the initial staffing numbers to support moving towards end of commercial operations and that's been shared.

And then from a nuclear, and specifically OPG level, we have a specific team in place looking at the changes to OPG and nuclear based on end of commercial operations for Pickering.

We will continue to communicate those plans as we move forward to make sure staff are aware.

**THE PRESIDENT:** Again, I'd like to piggyback on this. So, I've asked this question many times. Everybody -- your staff knows the end of life here, so how do you retain them so you're the best on the last day, quote/unquote?

Are you guaranteeing them continuity, transition; what's the plan?

**MR. GREGORIS:** Steve Gregoris, for the

record. So, I'll begin the answer here and what I'll do is, I'll share with you -- I mentioned in Part 1 that I worked at Pickering for over 20 years. Prior to my last year at Pickering I was away from Pickering for three years, both at Darlington and down in Atlanta at the Institute of Nuclear Power Operations.

Coming back to Pickering I see a different plant. I see a plant where there are a lot of new people that have been hired into the plant and with the new hiring that's allowed other people to move up into supervisory, management roles and, overall, we have a workforce that is new with fresh ideas, engaged and committed to move that station forward.

We have a new and slightly different approach to leadership. It's facilitated leadership, it empowers people to make decisions, it empowers them to drive their areas of business and it really engages those people in their work.

And we've also taken a lead, and I mentioned it in the presentation, around innovation. And that's changed the culture and how we think. The boundaries and barriers that used to be in place have been broken down and that really leads to a different culture, a different thinking.

And overall, it's led to not only improved performance, but a really good place to work; a place where people are motivated and engaged and where they want to work.

So, what else can you do as an employer other than provide a place where people want to come to work?

So, on top of that, as I've said, we've been hiring people and we don't have a problem hiring people and will continue to hire people to ensure that we staff the company appropriately and we'll continue to communicate to them so they understand the business and the changes as we move forward.

**THE PRESIDENT:** Did you answer my question? I'm trying to find the answer here.

So, when they know the operation will stop in 2024, what happens to those who are no longer required?

**MR. LOCKWOOD:** Randy Lockwood, for the record. So, what you're really talking about, President Binder, is that specifically what will happen exactly and that's what we're working on now.

As I outlined in Part 1 of the hearing, that the closing of the Pickering station is

a rather large asset and has significant impact on the company and OPG, to so much so that our strategic plan has moved from five year -- a typical five-year plan to a seven-year plan to incorporate closing of -- or the end of commercial operations for Pickering.

So, that is actively being pursued. We have a staffing plan in terms of making sure, do we have the right number of people with the right skills to safely operate Pickering out to the end of commercial operations in 2024 and to safely shut down the units and place them in safe storage. Of course we do, right.

What we're working on also is, how are we going to transition staff in the end? Certain staff will have to go to various parts of OPG. We'll have to continue discussions with our partners such as the Society of Professionals, as well as the PW, as well as the community; various stakeholders. We will try to balance all things to ensure that we address all interests from the various stakeholders, including our shareholder and the rate payers of Ontario.

Up until that point, as I spoke about earlier today, and which Mr. Gregoris just spoke about, is how are we going to maintain the staff engaged because, really, I believe that's what you're really asking. So we

have the right number of staff there and they have the right skills. How are we going to maintain them engaged? We thought a lot about that.

Similarly, I'll just point out to you that outside evaluators, WANO, OSART, et cetera, have come into the plant expecting to find a morale problem and there is not one.

It really comes back to, in my mind is, "Yes, we have to work with the various groups, and no, the company is not going to end at the end of commercial operations at 2024 for Pickering. So it's about making sure that we do our work and making sure that people communicate with the various stakeholders and that they are aware.

We have taken a lot of initiative in that way in terms of our business plan rollouts yearly. You come on to our site. There is a very clear road map of where we're going in the next couple of years and right beside it, the priorities for the current year. We make reference to those in all meetings.

Similarly, we host face-to-face sessions every two weeks where staff can come at various parts in the plant and speak to senior management about what's happening and where are we going.

We communicate in various ways from my

office from the Director of Operations and Maintenance each week to make sure staff are aware of what's happening onsite and where is the plant going. I think that's very, very important.

As well, we have changed the media at the station to make it more electronic. You come to our admin building now, there is about a six by nine-foot screen. We have various kiosks around the site to make sure staff are aware of what's going on and what's going to happen going forward.

As well, I spend one month or one day a month in each control room at Pickering. I rotate through the various crews during the day shift so I've got a feel for and get a chance to interact with the various trades and the operators, to get a feel for what's happening in the station and what are their concerns.

Also, a coffee time session with myself once a month where we select various employees from all different work groups so I can hear firsthand what are their concerns. Naturally, I understand that people are concerned about their livelihood, going forward, for themselves and their families. What we will promise to do is continue to work with them and communicate to them what's happening with the station going forward.

The remaining points about maintaining,

engage -- enthusiastic about work, is we're having some of the best performance in the history of the plant, as I pointed out. People like to be part of that team and they are determined to make the station, its last day its best day. I can't add much more than that.

**THE PRESIDENT:** Thank you. Dr. Demeter...?

**MR. FRAPPIER:** Gerry Frappier, for the record.

Perhaps I could just weigh in a little bit on this because staff is also concerned about this line of questioning.

And so clearly, there is a requirement in the licence for minimum shift complement. So if, for whatever reason, they didn't have the minimum number of staff that have the required skills and the certifications then they would have to shut the plant down.

But more importantly to this conversation is the requirement in the licence condition 15.4 that they come to us with a sustainable operation plan that envisions exactly, I think, what the Commission Members were talking about. We're still a few years out for that, but we do expect to see by sort of 2020 that we would have a very

comprehensive plan in place as to what is going to happen to staff.

And then as we get a little bit closer, three years in from closure, they have to bring forward a stabilization activity plan which will have very specific details as to how the staff is going to transition through that shutdown phase.

Both of those will be brought forward to the Commission as part of our regular updating to the Commission.

**THE PRESIDENT:** I don't want to belabour this, but does such a plan exist for the shutdown, the original shutdown of 2020?

**MR. FRAPPIER:** So yes, there was a plan that was in place. I guess then I could get Mr. Al Omar to give us some more details. However, it was the beginning of it because again, it was -- 2020 is still a few years away.

But if you want some more detail on where that was at, Mr. Omar could give us some more details.

**MR. OMAR:** Al Omar, for the record.

We started to talk about the sustainable operations plan for the shutdown of 2020, back in 2011. Over the years, over five years, we

developed the requirements and the expectation and we reviewed OPG's response in the successive annual submission of the SOP. We call it the SOP -- until they submitted the 2016 sustainable operations plan before they decide to extend operations to 2024.

When they announced the extension of operations to 2024 in 2017, we said -- we put the conditions. We have the requirement for them to submit a sustainable operations plan five years before the shutdown in 2024. That means the first four months of measurement of the SOP will be in December 2019.

Furthermore, in 2017, we sent them formally our expectations and requirements for the SOP. That included, very clearly, a presentation of long-term workforce planning and, more importantly, resource transitioning and staff strategy while approaching the end of operations and as well when the units are shut down through the transition period to the safe storage stage.

So at the boundary -- especially at the boundary at December 2024, where the whole thing will change from the organizational point of view, from the workforce required to transition from one phase which is commercial operation to stabilization

activities, they have to present that.

The SOP will be submitted annually every year to the CNSC staff and then any feedback from the OPEX will be reviewed and assessed as per the following submission every year.

**THE PRESIDENT:** Thank you. That was very useful.

So you will present the first one, the 2019, in the ROR somewhere?

**MR. FRAPPIER:** Gerry Frappier, for the record.

So as Mr. Omar mentioned, so December 2019 is when we are expecting it, so when we present the ROR we'll certainly mention it. The extent to which we go into details would be at the pleasure of the Commission, of course.

**THE PRESIDENT:** Thank you.

**MR. CHATOOR:** Ralph Chatoor, for the record.

This is an issue of concern to the society as well. I underscore that on page 25 of our intervention. We state that it should be granted a 10-year licence. The society looks forward to OPG developing such staffing plans as part of the SOP and the SAP, to refer to it colloquially.

Thank you.

**THE PRESIDENT:** Thank you.

Dr. Demeter...?

**MR. DEMETER:** Thank you.

This is -- I want to get a bit of rubber hits the road question here because we have a lot of sort of broad stroke discussions. So this is -- we are going to be here for five days. There is going to be a lot of deliberations so this is without prejudice to the final decisions of the Commission. But I am going to take this from the status quo.

So the status quo based on the licence is to cease commercial operations in 2020. If that's the case, then a lot of these just transition rights activities should have been taking place already for that.

So I am asking the intervenor, based on the status quo when the licence to operate would cease, have some of these transition rights been put in place, like hard rubber on the road transition rights programmed, not just sort of morale and things are going well and people are happy, but an actual roll-out for the current licence?

**MR. FIERRO:** So Joe Fierro, for the record.

If, as you say, the Commission decided that the plant wouldn't run beyond 2020, it would be -- there is processes in place that we could begin to deal with staff and what the impact of that would be, but it would be unlikely to be completed that quickly. But regardless of whether it happens in 2020 or 2024, there are going to be some staff that leave happy at the end of a career and there will be some that we will try and find other opportunities for, but we may not be able to find the other opportunities for, through the processes in the collective agreement to try and match them to other jobs. They may have a skillset or location desires that just don't work.

So we will do our best to try to match them but it may be unlikely that they will all be able to continue working at OPG after that date.

**MEMBER DEMETER:** So OPG, if your status quo prevailed, you would have to have plans in place to maintain your minimum shift complement and like more than sort of morale checks. Are there actual programs that would say that's plan B, how do we do this?

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

I am the Vice President of Nuclear

Regulatory Affairs and Stakeholder Relations at Ontario Power Generation.

So let me point out first off that we have a collective agreement with the Society of United Professionals. It has an article in it that describes the processes that apply should the company find itself in a situation, hypothetically, where some redeployment staff is required or downsizing of staff is required. That is an article which has been employed in the past.

Ontario Hydro, our predecessor company at Ontario Power Generation, have exercised the collective agreement articles around re-deployment of staff. That's a process that's worked on between the employer and the union. It's a somewhat lengthy process. At the end of the day, you know, all of the necessary legal requirements are met. Different things may arise depending on the particulars of the situation.

But just to give an example for past history, back in the 1990s we had a situation where Ontario Hydro was a company of approximately 30,000 employees. It went through a considerable downsizing exercise as a construction engineering segment of the company was no longer necessary at that time.

As one of the other speakers has pointed out, not everyone ends up necessarily happy as a result of that, but there are processes and they have been successfully deployed in the past and if necessary would be again.

**THE PRESIDENT:** Thank you.

Questions?

Ms Velshi?

**MEMBER VELSHI:** Just to follow up on the discussion we've been having, I want to get Staff's reassurance about the oversight. Given the existing licence, are you happy that the sustainable operation plan that they have in place, if the plant was to shut down in 2020, is robust and adequate enough or have our requirements changed since the last requirements were made?

**MR. FRAPPIER:** Gerry Frappier, for the record.

I will ask Mr. Al Omar to comment on that in a minute.

Just again to reiterate though, that although we did get an initial sort of SOP very shortly after, we also got an indication that we were going to continue operating longer.

So our emphasis on this plan, its

priority went down, shall we say. So we would be expecting, as Dr. Omar mentioned, over the next couple of years we would certainly be looking at this in a much more intense way.

Al, I don't know if you have more to comment?

**DR. OMAR:** Thank you, Mr. Frappier.

Al Omar, for the record.

The 2016 SOP that was planned for 2020 has enough information to meet our expectation and requirement, as indicated.

The only change I would think, and we expect, is the relationship with the union and the sensitivity of the information in this case.

The information about workforce management, for instance, and how they deal with it, I think we will get the information definitely but it will not be exchanged through e-mails, for instance, or formal communication. We have to see it in person and we will assess it as such.

From the information we have seen in 2016, OPG fulfilled or demonstrated that they met the requirement and expectation. So I think we are assured, at least until we see the submission of 2019, that the information in the SOP will ensure the

continued availability of enough resources to take the station into the end of commercial operation in 2024.

**MR. JAMMAL:** It's Ramzi Jammal, for the record.

I would just like to confirm a couple of things.

I do not want the discussion to become a labour relation issue with respect to OPG and the Professionals.

The question with respect to Dr. Omar's answer is the fact that we require them to present to us the necessary position that is required to maintain safety at all times.

As was mentioned, they have to be as safe at Day Zero as it is at Day One.

What we do is we carry out the compliance activity. If Staff review on a desktop the staffing plan, we do go on site to make sure that there is adequate training. It's not just the number of staffing that is present. So there is always adequate training in order to carry out the licensed activity.

And as was mentioned by Mr. Frappier, if they do not meet the requirement, then we will stop that activity until there is such time adequate

training for personnel.

So we do the verification at all levels.

As Staff mentioned, they look at the plan, as an approved, agreed-upon plan for us to get adequate information, and then we go out into the field to verify not just the number of staff but the qualification of staff in order to carry out that activity.

I just want to close the issue that it is safety-driven and will be verified in the field. Thank you.

**MR. FIERRO:** Joe Fierro, for the record.

Nothing that we have said should be construed to say the plant isn't safe today, isn't properly staffed today. The plant will be properly staffed and will be safe in 2024.

What isn't 100 per cent clear is the details of the plan for those staff when we get to that point and what would happen. And that's one of the things we are talking about in this round of collective bargaining, to come up with some possible ways to interact in a better way to solve those situations and present that to the employees so they

clearly understand what is going to happen.

**THE PRESIDENT:** So that leads me to page 7. You really didn't like the OEB decision, the way I read it.

So tell me why you didn't like it. And maybe from OPG: Is there any implication here for safety?

**MR. FIERRO:** Joe Fierro, for the record.

There is no implication, in my opinion, on safety. What it is, is the OEB making an incorrect determination that the nuclear licence staff should not be funded and paid at the 75 per cent quartile but at the 50 per cent.

So OPG will continue to pay them at the 75 per cent quartile but just not get that money from the OEB.

So that's an example where OPG will be slightly less profitable but will continue to have the same high quality individuals in those positions where they need them.

So it's the OEB not giving OPG the money they requested to fund the staff compensation levels that they felt they needed.

**THE PRESIDENT:** OPG, do you care to

comment on this?

No? You have to appear in front of another Regulator for that, I guess.

**MR. LOCKWOOD:** Randy Lockwood, for the record.

I'm not going to comment on the OEB.

**THE PRESIDENT:** No. I'm just interested if there's any impact on you in terms of -- I was surprised at this decision because I thought some of your employees are very highly professional, paid a good salary at a high level. So I didn't understand that either.

And I'm just curious to know if there's any implication around safety and the kind of people you can retain.

**MR. LOCKWOOD:** Randy Lockwood, for the record.

I want to take the Commission back to our third commitment that we made earlier today and all through our licence application: that we will sustain an engaged workforce.

Our staff are motivated, engaged, qualified and competent to operate this plant to the end of 2024 and to place it in safe storage.

I don't believe, President Binder,

that the item you specifically mentioned will affect staff engagement.

**THE PRESIDENT:** Thank you.

Anybody else? Any other questions?

Last words to you.

**MR. CHATOOR:** President Binder, I think it's apropos, with the indulgence of the Commission, to close with a quote from one of our members. It's short. Sometimes voices of members get lost. It is important to read into the record what one had to say.

"I came to Pickering Nuclear some 17 years ago after working in a variety of industries. Since arriving my experience can best be described as one of continuous learning and growth. This was enabled by the existence of a rigorous training program, opportunity for work rotations and engagement in charitable activities and benefit to the host community. Coming from outside of the nuclear industry, I noted that the society in

tandem at OPG have made considerable efforts to import best practice and furnish employees with the necessary tools and skills to perform at their optimum, safeguard against injury and protect the environment. As a Society member and as an employee of OPG, I feel a deep sense of commitment and pride in my work and workplace."

(As read)

Thank you for having the Society produce this oral intervention. We would like to congratulate you on your next steps forward in your subsequent life's pursuits, and we would like to congratulate Ms Velshi on her appointment.

Thank you and good afternoon.

**THE PRESIDENT:** Thank you.

**MR. LEBLANC:** Thank you.

We just want to verify if Mr. Andrei Neacsu is here in the room. He would be the next presenter but we have not identified him.

Are you here, Mr. Neacsu?

If not, we will treat your request to

present as a written submission.

Thank you.

**THE PRESIDENT:** The next presentation is by BWXT Canada Ltd., as outlined in CMD 18-H6.26.

I understand Mr. Lundy will make the presentation.

The floor is yours.

**CMD 18-H6.26**

**Oral presentation by BWXT Canada Ltd.**

**MR. LUNDY:** For the record, Jon Lundy, Vice-President - Strategy and Business Services of BWXT Canada.

I am here on behalf of our over 1,000 employees to speak in support of Ontario Power Generation's application to renew Pickering's operating licence for a period of ten years.

BWXT operates in six locations across Ontario and everything we do is in support of nuclear. We make large and small pressure boundary components. We provide engineering services. We provide outage and field services. We make fuel and fuel handling systems.

We just bought Nordion's medical

isotope business and after we close that transaction we will be producing medical isotopes for Canada and other countries around the world.

So we know nuclear. It has been our business for over 60 years.

We have extensive experience working with the CANDU reactor fleet nationally and internationally and have a proven track record of providing reliable and effective services and components that help our customers operate their nuclear plants safely and efficiently.

We also have a deep and long-standing relationship with the Pickering Station that stretches back to its construction in the 1970s. We supplied its original 96 steam generators and we have supplied its 28-element natural uranium fuel since it first came online in the 1970s.

Since that time we have continued our work with OPG and successfully executed a wide variety of specialized work, such as valve services and outage services, as well as the design and manufacture of the universal delivery machine, heat exchangers and other specialized tooling.

Having worked with OPG for decades, we know full well the emphasis and priority they place on

safety and continuous improvement. This is highlighted by superior performance at Pickering where they have a focus on improving performance year over year so that their last day is their best day.

Some superior performance metrics bear mentioning.

Regarding safety, in 2015 and 2016 the CNSC awarded Pickering station its highest achievable safety performance rating in key areas including: operation performance; safety; reliability; and, human performance.

This past year, in 2017, Pickering's all injury rate was zero until September 2017, and they ended the year at a rate of 0.06, which is in line with industry best. These ratings are a direct reflection of OPG's unwavering commitment to the safe operation of the Pickering station.

On operations, there has been superior performance as well. For instance, as a result of completing two outages ahead of schedule Pickering exceeded its generation target for the year. It also exceeded its maintenance backlog targets and two units achieved record runs in between scheduled outages.

These results do not happen by chance. They are the result of strong leadership and an

unwavering commitment to safety, quality, and operational excellence which OPG extends to its suppliers like BWXT as well. As a key supplier to the CANDU industry with a long history of working with OPG, we know OPG holds our work to the highest safety and quality standards, a responsibility that we take seriously.

To ensure we have a thorough understanding of OPG's quality objectives, BWXT employees work closely with OPG personnel in design, procurement, and quality roles. As a provider of natural uranium fuel to OPG, an OPG quality representative is stationed on site in our Peterborough facility in an oversight role to perform compliance reviews and inspections.

While safety remains at the core of everything in the nuclear industry, there are other significant advantages of the continued operation of the Pickering station that will help address important needs in health care, environment, and economy, all of which benefits Ontarians and people all over the world.

Regarding health care, OPG harvests Cobalt-60 from three units at Pickering that is used to safely sterilize medical equipment and food

products. Everyday as thousands of people around the world undergo surgery or medical procedures, they rely on Cobalt-60 as an effective means of ensuring sterile medical devices to keep them safe and protect their well-being.

Health care in Ontario, and all Ontarians, benefit not just from Pickering's production of Cobalt-60, but from the simple fact that carbon-free nuclear power helps keep the air we breathe clean.

From an environmental perspective, nuclear power from Pickering not only powers one in seven homes and businesses in Ontario, but it plays an important role in reducing greenhouse gas emissions. Continuing the operation of Pickering to 2024 will reduce greenhouse gas emissions by an estimated 17 million tons, which is the equivalent of removing 3.4 million cars off the road every year.

Lastly, Ontario's economy also benefits from the nuclear industry as a whole, and will benefit from the continued operation of the Pickering station. Across Ontario about 60,000 people directly or indirectly rely on the nuclear industry for their jobs. Locally, the continued operation of the Pickering station will result in 4,500 direct and

indirect jobs across the Durham Region.

A renewal of Pickering's operating licence will ensure the people and businesses of Ontario continue to have a reliable and clean source of base load electricity during refurbishment of Darlington Nuclear Generating Station and the initial Bruce Power refurbishments.

OPG has been safely and reliably operating the Pickering station for over 40 years, and we continue to have complete confidence in OPG's ability and commitment to operate Pickering to 2024 with the highest regard for the health and safety of its workers, community and the environment.

Thank you.

**THE PRESIDENT:** Thank you. Questions?  
Dr. Demeter?

**MEMBER DEMETER:** Thank you very much for your presentation.

Risk is always balanced with benefit. Maybe you can help me understand the broader picture of the importance of the Canadian contributions to Cobalt-60 supply for North America, for the world, and what sort of piece of the pie that Pickering has for that?

**MR. LUNDY:** Jon Lundy, for the record.

You know, Cobalt-60, three units at Pickering are involved in the production of Cobalt-60. So a big portion of the world's supply benefits from that. So I think it is something that we don't think about when we think about nuclear power, about all of these other benefits.

It's not just Cobalt-60 -- I mean, Cobalt-60 at Pickering, but I think OPG clearly has desire to do other isotope work as well. It's really the social licence part of nuclear power that people don't think about, the other ways that nuclear power benefits society; on the isotope side Cobalt, which is gamma, and also medical isotopes help all of Ontario and all of Canadians.

**MEMBER DEMETER:** Thank you. Maybe OPG has a sense of market share. I mean, this came up with the medical isotope crisis with the NRU. You know, they supply the majority of North America, 40 per cent of the world, and so we have to deal with that sort of transition with Cobalt. The market share would be important, as a sort of national/international benefit.

**MR. LOCKWOOD:** Randy Lockwood, for the record. As I know it, Pickering supplies 20 per cent of the world's supply, and we will confirm that and

get back to you.

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

**THE PRESIDENT:** I'm trying to understand, that you have now three of the channels being dedicated to Cobalt, if I understood correctly. But once Pickering is closed, you cannot produce anymore Cobalt, is that the idea? Has any thought been given just as a Cobalt machine, or I'm way way out there?

**MR. LOCKWOOD:** Randy Lockwood, for the record. No, you're not way out there, President Binder. The way we produce Cobalt is we change the adjuster rods and insert the adjuster rods. Normally, of course, they sit most of their time in the core and then they're irradiated and create the Cobalt-60. Then during the outages we harvest that Cobalt-60, take out the adjuster rod and take that part off site.

Longer term, when Pickering shuts down we will no longer be able to produce Cobalt-60 with the Pickering units. There'll be no more way to irradiate the adjuster, right? There'll be no more neutron flux. However, we are looking at other options, and I'll probably leave it at that, to use our other reactors.

**THE PRESIDENT:** Thank you. Questions?

Dr. Lacroix?

**MEMBER LACROIX:** Yes, I do have a question. With respect to safety, what sort of challenges to you anticipate with OPG during the next 10 years?

**MR. LUNDY:** Jon Lundy, for the record. I think OPG is world-class in the way that it assesses its operational needs. They are a leader and I wouldn't expect anything less of a stellar performance from them and their demands on their supply base as well.

I mean, the influence that they have had on BWXT I think is profound, it's not always welcomed, but it is on the supply chain, but it has made the supply chain world-class as well. I think, one of Ontario's advantages is its nuclear supply chain, one of the best around the world, and it's because of companies like OPG and demanding excellence from its supply chain. The excellence is in terms of safety and quality.

So in a long-winded answer, I don't expect any deviation in that type of emphasis or performance.

**MEMBER LACROIX:** Thank you.

**MR. LOCKWOOD:** Randy Lockwood, for the

record. I want to confirm the 20 per cent that I said earlier, that to be the case. Right?

As well, I think it would be appropriate around the safety piece to share with you my expectations. The intervenor is correct, in that we do have as priority 1, a focus is on safety: the worker; the public; and, the environment.

In terms of vendors and contractors on site, I'll share with the Commission my expectation is you cannot tell them apart from any other OPG employee, exactly the same. That will continue, and our focus will continue on safety, it's our number 1 commitment of the six commitments that we made to you earlier.

I will share with you that from a worker perspective, there is nothing that means more to me than all the workers going home at the end of their shift. I'm very proud of our record for 2017, and we're going to continue that going forward.

**THE PRESIDENT:** Mr. Berube?

**MEMBER BERUBE:** Yes. I believe you spoke about manufacturing some fuel for OPG, and that'd be an on-site inspector, is that correct?

**MR. LOCKWOOD:** Yes.

**MEMBER BERUBE:** Could you talk a bit

about that process from a quality standpoint and a process standpoint, just to give us some sense of, you know, how thorough OPG is in this process, in this manufacturing process, in this partnership with you, please?

**MR. LUNDY:** Jon Lundy, for the record.

Well, we have at least one person at all times in Peterborough and we have at different times in the year probably as many as three or four people auditing and doing quality control on all facets of the fuel business. Whether that is manufacturing our fuel tubes in Arnprior or pellets in Toronto to fuel bundling, there are control points, there are -- it's constant monitoring and auditing.

**MEMBER BERUBE:** So you are satisfied basically that OPG is actually really concerned with quality and safety of your product before it goes into their process?

**MR. LUNDY:** Yes.

**MEMBER BERUBE:** Okay. Thank you.

**THE PRESIDENT:** Question? Question?

So just out of curiosity, what is universal delivery machine?

**MR. LUNDY:** It's I believe on the fuel handling side. I probably could get some technical

help from OPG, but it's on the fuel handling side of the business.

**THE PRESIDENT:** Okay, I'll bite. What is it?

**MR. LOCKWOOD:** Universal delivery machine, it's for completing channel inspections during maintenance outages. Just as the name implies, universal delivering machine to deliver the various apparatus or instruments or tools to make the inspection to the fuel channel.

**THE PRESIDENT:** It's a remote kind of a thing?

**MR. LOCKWOOD:** Remote in that, yes, we use it during the outages. It's not normally there during a high power operation.

**THE PRESIDENT:** It sounds like an impressive tool. Anyhow, thank you for that.

Yes, go ahead.

Okay, thank you. Any final thoughts, Mr. Lundy?

**MR. LUNDY:** No. Thank you for the opportunity.

**THE PRESIDENT:** Thank you.

**MR. LEBLANC:** So the next intervention was to be from Ms Barbara Pulst. She has informed us

she is no longer available and her intervention is going to be dealt with as a written submission.

And this, Mr. President, was all the interventions we had planned before 5:30, unless somebody who was going to present this evening is here in the room, I will just ask, I don't think so, but either Ms Kirsten Dahl or the Toronto District School Board and the Toronto District Catholic School Board, that would be Anthony Montemurro or Cynthia McCarry or Dominique Bruce. So if none of those persons are here right now, we are going to do something we don't typically do but we always plan to do, so we are going to do some written interventions until 5:30 and we will resume at 6:30 with the oral presentations by those three individuals or organizations.

Mr. President...? So I am going to walk you through the written submissions. Would you like to start with those? Okay. There are four of them, so we will start with those four. Thank you.

**THE PRESIDENT:** So you want to take us through where they are --

**MR. LEBLANC:** Yes.

**THE PRESIDENT:** -- so we can find them?

**MR. LEBLANC:** So those that were

scheduled to take place today and are now going to be dealt with as written, there was Ms Kelly Clune, if I recall.

**THE PRESIDENT:** Which number is that?

**MR. LEBLANC:** I will just verify. I want to make sure I'm not mistaken.

**THE PRESIDENT:** Because I didn't see it in my --

**MR. LEBLANC:** No. Let me just verify. Yes, she was -- I did not mention her, she was right after Mr. -- I mentioned her earlier when I did the introductory remarks.

**CMD 18-H6.78**

**Written submission from Andrei Neacsu**

**MR. LEBLANC:** So why don't we go in order of how they were going to present, with Mr. Andrei Neacsu at CMD 18-H6.78.

**THE PRESIDENT:** I have that. Questions? Does anybody have a question?

**MEMBER LACROIX:** Yes, I do have a question.

**THE PRESIDENT:** Go ahead.

**MEMBER LACROIX:** He mentioned somewhere in the report that -- what does he say? Oh yes, the safety of fuel channels is 70 percent assured. Could OPG explain to me what it means by 70 percent? It's on page 2.

**MR. MANLEY:** Robin Manley for the record.

**MEMBER LACROIX:** Second paragraph.

**MR. MANLEY:** Maybe I will start and then if necessary we can provide more technical content.

**MEMBER LACROIX:** Okay.

**MR. MANLEY:** So as you would have seen in one of the attachments to the CNSC staff's CMD, there is a lengthy presentation that was made by CNSC staff in January at a Commission meeting which talked about fuel channels and the various aging mechanisms and how the licensee, first off, and, secondly, CNSC staff can have confidence in the safety and reliability of the fuel channels throughout the intended service life, both where you are today and in the future, and as we can provide in more technical detail if necessary, as one goes through the evaluations of the fuel channel fitness for service in future periods you can have very high confidence in

the near future because you have done all sorts of assessments and you have models and you therefore know what the state of your fuel channels is, right? As you look farther into the future your confidence can be at a lower level because you are farther away, right? So you are going to have to continue to do those inspections, you are going to get the results from those inspections, you are going to check them against your models and make sure that you are accurate, right? So at one point or other we would have been talking about medium confidence versus high confidence and that would have been put in some sort of number in general terms.

**MEMBER LACROIX:** But how do you compute this number, 70 percent? Is this what you call medium confidence, high confidence?

**MR. MANLEY:** Robin Manley, for the record. So we are going to pass that back to our Fuel Channels staff. Kathy Charette, please.

**MS CHARETTE:** Hi. Good afternoon, it's Kathy Charette, I'm the Senior Manager of Fuel Channel Life Extension Project, for the record.

So the reference that the author of the report provided was with respect to a business case study that was done by OPG some years ago. At

that time we felt that all we needed to have in order to make a decision on operating the Darlington and Pickering stations beyond the limits that were provided in the business case study was 70 percent confidence. So it had nothing to do with fuel channel fitness for service itself, it was not a measure of safety, it was just business planning confidence for decisions.

**MEMBER LACROIX:** Okay, I get it.

Thank you.

**THE PRESIDENT:** Ms Velshi...?

**MEMBER VELSHI:** Sorry, I don't get it. Maybe I will ask staff this. So when we talk about a very high level of confidence, is there a number, a percentage associated with that? Because 70 doesn't sound like a very high confidence level.

**MR. FRAPPIER:** Gerry Frappier, for the record.

As was just mentioned, the 70 percent aspect has nothing to do with our confidence in pressure tube fitness for service, but perhaps I would ask Dr. John Jin to provide some information on our level of confidence.

**DR. JIN:** For the record, I am John Jin. I am the Director of the Operation and

Engineering Assessment Division at the CNSC.

To make it clear, the intervener is referring to another report which is called Fairwinds Associates report. It was prepared in 2013 and to my knowledge their report was submitted during the last previous licensing hearing that we addressed the concern. The 70 percent came from that report and that is referring to an OPG internal document which was about its business plan planning, nothing to do with the safety or fitness of service or structural integrity. When it comes to the structural integrity assessment, usually we use 97 percent or 99.7 percent type of thing. We never use 70 percent as confidence for the fitness. So this -- and I have already made a statement from OPG regarding the business plan risk assessment.

**MEMBER VELSHI:** So just to make sure I understand it, when we say we have a high level of confidence in the fitness for service for, say pressure tubes, it would be at least 90, 95, 99 percent or whatever, right?

**DR. JIN:** For the record, John Jin. That's correct. In terms of assessment there is no such thing about using the percentage, we just make sure it meets all the

requirements. In some areas we sometimes use the probabilistic assessment and in that case we use a high level percentage for the confidence.

**MR. MANLEY:** Robin Manley, for the record. If I can just add one point to that.

I completely agree with Dr. John Jin there, but it was suggested that we sort of reiterate that the fitness for service criteria that we have to meet are set within the CSA standards and we meet those. What we say in a business case model is a different thing. Thank you.

**THE PRESIDENT:** Questions? Questions? Go ahead.

**MEMBER BERUBE:** A recurring theme here from some of the interveners and one that comes up here, he points out very clearly that there's a lot of public concern about cybersecurity as it pertains to nuclear power plants. As you can imagine, that makes people anxious. If you could in general terms, without getting too specific about what you are doing, how you are actually accommodating that aspect of your operations?

**MR. BURNS:** Scott Burns, Vice President, Security and Emergency Services. I will just speak to that at a high level.

We do have an overarching policy for cybersecurity at OPG. The program is designed to protect computers and software which are used to monitor and control the plant. I would mention that plant operations are separate and distinct from our business applications. I wanted to make that clear. Our program is compliant with CSA standards. The program is a risk-based program and priority is given to cyber assets with the highest impact on plant safety and reliability. It also focuses on security, fire protection and emergency preparedness programs.

All staff and contractors complete training on cybersecurity threats and how to avoid them, and staff who use external hardware, example laptops, as part of the monitoring and maintenance activities receive additional focused training. We also have ongoing training of our staff in terms of phishing applications. So on a regular routine basis we test our staff and they are really becoming quite proficient at being able to identify phishing opportunities.

So it is a very robust program and we are confident that our assets are secure and safe.

**MEMBER VELSHI:** I wanted to give OPG an opportunity to correct the record. So the

intervener on page 2 at the top starts off by talking about steam generator tube thinning and then quickly jumps onto pressure tubes and I just wanted -- so maybe two parts to the question. The one is with steam generator tube thinning, if you do find them, how do you manage that? And currently, what percentage of your tubes are not in a good enough condition that you have had to plug them or whatever it is that you do to manage? And at the end of 2024, if you were to continue operating, what percentage would that be, do you think?

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

Well, first, I would just point out, Commissioner, as you pointed out, the paragraph here talks about steam generators and steam generator tubes and then refers to pressure tubes. Pressure tubes are associated with fuel channels and not steam generators. So in particular -- so that's an error. In particular to the steam generator tubes, we do have a lifecycle management program that looks specifically at steam generator condition, including the tubes. That lifecycle management program meets CSA standards and is executed during outages, where those tubes are inspected and there are specific criteria that are

used to determine whether the tubes are okay to operate the next cycle.

With regard specifically to the state of the tubes, I'm going to ask Jason Wight, our Director of Engineering, to speak to that.

**MR. WIGHT:** Jason Wight, Director of Engineering, for the record.

As just indicated by Steve, we do have a lifecycle management plan for our boilers where we periodically and regularly plan, do, check, act, we inspect all the boiler tubes. In fact 100 percent of half the boilers every outage we inspect. So it is a very robust program and there are no tubes right now that aren't available for service that are in operation and they all have significant margin within the tubes. Currently from a percentage standpoint, I think our plugging maximum right now, in other words a boiler that we plug, the maximum is about 6 percent, on Unit 5 is about that. Currently our prediction is there's no issues with regards to plugging limits to the end of 2024 as per our projected methodology, but we are currently always monitoring and we expect every outage to continue that.

**MR. LOCKWOOD:** Randy Lockwood, for the record.

I would just add that the steam generators were considered as part of our PSR going forward and to reemphasize that if a tube is found not to meet standards, so to speak, then it's plugged prior to leaving the outage.

**THE PRESIDENT:** Questions? Questions? Okay. Thanks.

Marc...?

**CMD 18-H6.70**

**Written submission from Barbara Pulst**

**MR. LEBLANC:** So the next was from Ms Barbara Pulst. It's in CMD 18-H6.70. Ms Pulst was supposed to present just before dinner. Any questions from the Members?

**THE PRESIDENT:** Go ahead.

**MEMBER VELSHI:** A question to staff. On -- I don't think the pages are numbered, but the intervener makes the statement:

"The recent decision to increase acceptable tritium levels in water seems to coincide with aging CANDU reactors." (As read)

Can you comment on that? What levels

got increased?

**MR. FRAPPIER:** Gerry Frappier for the record. I would ask Mr. Mike Rinker to respond to that.

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

So we are not aware of levels being increased or permitted, provincial limits or federal limits that have been increased.

**MEMBER VELSHI:** Thank you.

**MR. LEBLANC:** Any other questions, Members?

**THE PRESIDENT:** Well, what's the reference -- I didn't understand the reference to this Dr. Amano of Japan, his written report on Organic -- OBT. I'm trying to understand what's the relevance here.

**MR. FRAPPIER:** Gerry Frappier, for the record. I would ask Andrew McAllister to provide some information.

**MR. McALLISTER:** Andrew McAllister, Director of the Environmental Risk Assessment Division. We looked for that reference by Dr. Hikaru Amano and we could not find that. CNSC staff stays abreast of the latest research regarding tritium and

that was one that we could not find. We were hoping that Ms Pulst would be here so she could perhaps clarify where that reference came from. But it is important to note that, you know, we do sample organically bound tritium through our Independent Environmental Monitoring Program, and OPG does as well, and it is found, albeit in low levels, in foodstuffs in and around nuclear power plants.

**THE PRESIDENT:** I think we will have an opportunity to discuss this a bit later on.

**MR. McALLISTER:** Yes.

**THE PRESIDENT:** Maybe tomorrow.  
Okay. Go ahead, Marc.

**CMD 18-H6.151**

**Written submission from Kelly Clune**

**MR. LEBLANC:** So another presenter who was not able to make it today but she informed us in advance was Ms Kelly Clune and her CMD is at CMD 18-H6.151.

**MEMBER LACROIX:** There's some confusion here. We just did it. That was Mrs. Clune. You just did that one after Pulst, wasn't it?

**MR. LEBLANC:** At H6.70?

**MEMBER LACROIX:** Mrs. Pulst is number 70.

**MR. LEBLANC:** Oh, it was the wrong number.

**MEMBER LACROIX:** That's right.

**MR. LEBLANC:** So should we do Madam Pulst then, at .70. Thank you.

**THE PRESIDENT:** We just did that.

**MEMBER VELSHI:** We finished that.

**MEMBER DEMETER:** We finished that, too.

**MR. LEBLANC:** We did the three of them already? Okay. So should we go to the full list now? Okay, from the start.

I could see Ms Velshi smiling and I could not understand.

--- Laughter / Rires

**THE PRESIDENT:** Neither could I.

**MR. LEBLANC:** Do you have a question? Do you have a question on 151? No, okay. Sorry about this. How confusing.

**CMD 18-H6.2**

**Written submission from  
Safe Communities of Pickering and Ajax**

**MR. LEBLANC:** The next submission is from Safe Communities of Pickering and Ajax, CMD 18-H6.2.

I will give the Members time to find it. No questions? Ms Penney...?

**CMD 18-H6.3**

**Written submission from the Rotary Club of Ajax**

**MR. LEBLANC:** So the next submission is from the Rotary Club of Ajax, 18-H6.3.

**CMD 18-H6.4**

**Written Submission from the  
Durham Nuclear Health Committee**

**MR. LEBLANC:** The next submission is from the Durham Nuclear Health Committee, CMD 18-H6.4.

Dr. Demeter...?

**THE PRESIDENT:** Do you have a question? Go ahead.

**MEMBER DEMETER:** I was just going to ask whether at some point the Medical Officer of Health will be available for questions that sort of deal more with the public health aspect. It's Dr. Kyle I think.

**MR. LEBLANC:** Yes, Dr. Kyle will be available as part of the Durham Region intervention.

**MEMBER DEMETER:** Okay. So I'll --

**MR. LEBLANC:** He will be one of the persons supporting them.

**MEMBER DEMETER:** I'll hold my question. Thank you.

**MR. LEBLANC:** He will also be here to answer questions as part of the Durham.

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

**CMD 18-H6.5**

**Written submission from the Durham College**

**MR. LEBLANC:** The next submission is a written submission from the Durham College, 18-H6.5.

Yes, I do have a question. Dr. Lacroix...?

**MEMBER LACROIX:** I have read in the submission that they have a partnership with OPG and I

would like to know more about their training program. What sort of facilities do they have and will they change their training in the next 10 years, expecting a decommissioning shutdown and so on?

**MR. LOCKWOOD:** Randy Lockwood, for the record.

Specifically to your question will it influence our -- we have a partnership and will the end of commercial operations at Pickering influence that? The answer is no. We will continue that. Unfortunately, we didn't bring -- we can talk to it superficially about this partnership, but we did not bring anyone to talk to those specific details.

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

I will point out, with regards to Durham College and the University of Ontario Institute of Technology, that we do have partnerships with both parts of that campus. Those partnerships are on power engineering side, where we train individuals to work directly in the plant, and also on the engineering side to develop them specific to nuclear engineering.

Those courses apply to both Pickering and Darlington. We would expect those courses and that partnership to continue at the end of commercial operation

for Pickering.

**MEMBER LACROIX:** Thank you.

**CMD 18-H6.6**

**Written submission from the  
Women's Multicultural Resource &  
Counselling Centre of Durham**

**MR. LEBLANC:** The next submission is from the Women's Multicultural Resource and Counselling Centre of Durham, 18-H6.6

**CMD 18-H6.7**

**Written submission from the  
Ajax Pickering Hospital and the  
Ajax Pickering Hospital Foundation**

**MR. LEBLANC:** The next submission is from the Ajax Pickering Hospital and the Ajax Pickering Hospital Foundation, 18-H6.7.

Ms Velshi.

**MEMBER VELSHI:** A question for OPG -- and we'd asked this at the Bruce Power licensing hearings as well.

Has the Ajax Pickering Hospital ever had

to treat a contaminated casualty from the station?

**MR. MANLEY:** So Robin Manley, for the record.

We're just having somebody have a check on that. To my knowledge, not, but we're going to look into that further.

I would expand, though, that we have arrangements so that when we do a nuclear emergency exercise, we have typically a practice in that we exercise the capability to do that. So typically one of our major emergency exercises will have a contaminated casualty who gets transported to the hospital and goes through the treatment protocol there so as to continue the exercise of that facility.

And it looks like we have somebody who's prepared to answer to that. Thank you.

**MS McDOUGALL:** Karen McDougall. I'm the manager of Radiation Protection, for the record.

As Robin had mentioned, our drill exercises do include the testing of the contaminated casualty response at our local hospitals. To my knowledge, we have not sent somebody that was actually in fact contaminated.

Many, many years ago, there was an individual that was sent to the hospital for treatment, and

there was some confusion over whether there was a contaminated casualty. But in the end, the individual was not contaminated.

**THE PRESIDENT:** I assume this will be, in the current language, a reportable incident. So some of the old-timers here from CNSC may remember that. No?

**MR. FRAPPIER:** There are several old-timers here, but --  
--- Laughter / Rires

**MR. FRAPPIER:** -- nobody remembers a case like that. And yes, we would know about it, I'm sure.

**THE PRESIDENT:** Okay.

**CMD 18-H6.8**

**Written submission from Laker Energy Products Ltd.**

**MR. LEBLANC:** The next submission is from Laker Energy Products Ltd., 18-H6.8.

**CMD 18-H6.9**

**Written submission from the  
Whitby Chamber of Commerce**

**MR. LEBLANC:** The next submission is from the Whitby Chamber of Commerce, 18-H6.9.

**CMD 18-H6.10**

**Written submission from  
Nu-Tech Precision Metals Inc.**

**MR. LEBLANC:** The next submission is from Nu-Tech Precision Metals Inc., 18-H6.10.

**MEMBER LACROIX:** Yes, I do have a question here.

I read in this -- in their report that  
"Nu-Tech Precision Metals has been the sole producer of pressure tubes used in CANDU reactors. We have manufactured every pressure tube operating in every CANDU reactor elsewhere." (As read)

Isn't that unwise to put all your eggs in the same basket? I mean, I know it's a highly specialized type of tool, but still, one manufacturer worldwide?

**MR. MANLEY:** So Robin Manley, for the record.

We're going to have Kathy Charette speak to that in a second. But I guess I would just say at a high level it's a highly technical, highly specialized skill, so. Kathy?

**MS CHARETTE:** Kathy Charette, for the record.

What's the saying, if it ain't broke, don't fix it? Along that lines.

We actually had talked about having a second vendor develop capability to produce pressure tubes, and we determined that it was actually too big a risk to change -- to change manufacturers. So we know where they're predictable, because we -- you know, we know that the quality of work that we've gotten from Nu-Tech, our tubes are predictable; that generally, the populations -- you can actually compare populations. They can be kind of equivalent to each other. So we're very comfortable with Nu-Tech.

**MEMBER LACROIX:** If they go bankrupt, what do you do?

**MS CHARETTE:** I think there's actually a risk in our system, for enterprise risk that addresses that. I don't know the details of it, but I think there are -- there are options.

**MEMBER LACROIX:** Thank you.

**MR. FRAPPIER:** Gerry Frappier, for the record.

I'd also add that they may be a little bit overselling themselves. India does produce its own

pressure tubes as well and certainly has indicated many times they would be happy to sell into Canada.

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

**THE PRESIDENT:** I just want just somebody to confirm all CANDU pressure tubes -- I'm talking about Lepreau -- Point Lepreau, Gentilly, and --

**MS CHARETTE:** So they produced all in -- Kathy Charette, for the record -- all the Canadian, for sure. I understand that Argentina is producing their own tubes for their reactor, but as far as the CANDUs go, I think that's a factual statement.

**THE PRESIDENT:** No, I'm surprised because I didn't -- I don't remember seeing them in Bruce, for example --

**MS CHARETTE:** Nu-Tech?

**THE PRESIDENT:** -- making this claim. So it's the first time I hear this claim --

**MS CHARETTE:** They produce Bruce Power's as well, I know that for a fact.

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

**CMD 18-H6.11**

**Written submission from the Town of Ajax**

**MR. LEBLANC:** The next submission is from

the Town of Ajax, 18-H6.11.

**THE PRESIDENT:** So there are some -- think they sent us a motion, here, from the Durham Council minutes. And I think that's a repeat about funding, et cetera. I think we should defer this until the Office of the Fire Marshal and Emergency Management will be at the -- to deal with some of those questions.

Unless somebody has something which is not in that vein. No? Okay, thank you.

**CMD 18-H6.13**

**Written submission from Station Gallery**

**MEMBER LACROIX:** The next submission is from Station Gallery, 18-H6.13.

**CMD 18-H6.12**

**Written submission from the Pickering Naturalists**

**MEMBER LACROIX:** Yes, I missed one, which was a written submission from Pickering Naturalists, 18-H6.12.

**MEMBER PENNEY:** I thought it was very interesting around the naturalization of the park, and I don't know if anyone at OPG can comment on that.

**MR. LOCKWOOD:** Randy Lockwood, for the record.

My apology, but we'll have to bring that back.

**MEMBER PENNEY:** It's only a curiosity, so you don't have to take an action on that, thanks.

**THE PRESIDENT:** But in the same vein, also, on number 2 -- this was number 1. On number 2, they talk about the salmon, Bring Back the Salmon initiative. I'm just curious to know how effective it has been. Is the salmon population in the lake -- is it better off?

**MR. McCALLA:** Raphael McCalla, for the record, director of Environment here at OPG.

Dr. Binder, while I cannot comment on what the actual increase in the population of salmon in Lake Ontario, what I can say is that -- and what has been indicated earlier on today is that OPG has been involved in restocking salmon in the lake for the last six years, and we continue to support that initiative. So I'm sure over time that population will rebound and increase significantly. But in terms of an actual quantity, I do not have that information today.

**THE PRESIDENT:** So no one monitors from, I don't know, the Ministry of Environment or even the society? You'd expect that somebody would try to monitor

the performance here.

**MR. McCALLA:** Raphael McCalla, for the record.

The Ontario branch of the Ministry of Natural Resources would actually monitor the actual population -- lake population. That information is probably available. But OPG does not have that information available to us.

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

The Ministry of Natural Resources and Forestry will be here on Friday when the Lake Ontario Waterkeeper is presenting.

**THE PRESIDENT:** Thank you.

**MR. LEBLANC:** The next submission is from AECOM Canada Nuclear Operations, Inc., 18-H6.14.

**THE PRESIDENT:** What? You skipped another one.

**MR. LEBLANC:** Well, I did mention Station Gallery, then we went back to Naturalists. I thought there were no questions on Station Gallery.

So back to Station Gallery. It's H6.13.

**THE PRESIDENT:** You're right. No questions.

**MR. LEBLANC:** So the next submission is from Jonathan Schofield, 18-H6.15.

**THE PRESIDENT:** AECOM, we didn't do AECOM.

**CMD 18-H6.14**

**Written submission from**

**AECOM Canada Nuclear Operations, Inc.**

**MR. LEBLANC:** Okay. You want to do AECOM?  
Let's do AECOM, CMD H6.14.

**THE PRESIDENT:** You have to go through the  
process. Right?

**MEMBER LACROIX:** Yes. Marc, what is  
AECOM? What is this company? Is it an engineering  
company?

**THE PRESIDENT:** Yes.

**MEMBER LACROIX:** Okay. Thank you.

**CMD 18-H6.15**

**Written submission from Jonathan Schofield**

**MR. LEBLANC:** The next submission is from  
Jonathan Schofield, CMD 18-H6.15.

**CMD 18-H6.16**

**Written submission from Black & McDonald Limited**

**MR. LEBLANC:** The next submission is from Black & McDonald Limited, CMD 18-H6.16.

**CMD 18-H6.17**

**Written submission from the  
Oxford Coalition for Social Justice**

**MR. LEBLANC:** The next submission is from the Oxford Coalition for Social Justice, CMD 18-H6.17.

**MEMBER VELSHI:** This is probably as good a time as any to ask CNSC staff is the level of oversight by staff going to increase over the next licensing term if the licence gets renewed for continued operation given the aging components? The requirements are what the requirements are. I'm just wondering, do you see a greater level of effort by the CNSC?

**MR. FRAPPIER:** Gerry Frappier, for the record.

At the last licensing period, the current licence, the Commission had requested that we increase our oversight on pressure tube integrity. That has been done and will continue to be done.

The comprehensive programs that we have in place right now would identify if we have any area that would require a significant increase in oversight. At this point in time, we don't envision something significant.

**THE PRESIDENT:** But you do have all the PSRs, IIPs, all those things you'll have to report annually on performance there.

**MR. FRAPPIER:** Gerry Frappier, for the record.

That's a very good point, yes. The IIP initiatives would be something that we'll of course be looking at that we weren't before, so I was thinking just from a budgeting perspective we haven't really put in for a significant increase in personnel.

**MR. JAMMAL:** It's Ramzi Jammal, for the record.

The question is with respect to is there going to be an increase. We have a comprehensive plan in place for plant inspections as the review process kicks in, and there is an approval with respect to the safety case by the Commission, so staff will do a plant inspection based on the performance of the licensee either via a review on a desktop or a performance in the field. We'll have a plant inspection, we have reactive inspections based on the

findings, and then we will have an unannounced inspection again based on events and so on and so forth.

From a budgetary perspective, the comprehensive plant inspection is already in place for Pickering. We have a five-year plan, and we adjust it on a yearly basis, so we will increase the frequency based on the findings, and targeting what we call a "focused inspection" based on pressure tube decommissioning, dismantling, and so on and so forth.

**THE PRESIDENT:** Ms Penny.

**MEMBER PENNEY:** It's not a follow-up question. I'm trying to understand the pamphlet that's attached to this letter. Maybe we're going to address this pamphlet, and maybe there are other authors of this pamphlet who are going to present in front of us, but has this been distributed in the area around Pickering? It appears to be authored by quite a few organizations. I just wondered, can anyone advise was this distributed broadly? Staff?

**MR. FRAPPIER:** I think we'll have to take it and come back to you on that. I don't know about the pamphlet, and I can't quite see our comms folks there.

**MR. LEBLANC:** Just for the record, many of the organizations that are signatories will be intervening

in the next few days, so it may be a good opportunity to ask them.

**MEMBER PENNEY:** So we can ask them. Okay.  
Thank you.

**THE PRESIDENT:** It's a good question to OPG. Have you seen these distributed around the Pickering neighbourhood? I'm not familiar with the Oxford Coalition.

**MR. MANLEY:** Robin Manley, for the record.  
No, we have not seen it distributed in and around the Pickering area.

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

**CMD 18-H6.18**

**Written submission from**

**Peter Tabuns, MPP Toronto-Danforth**

**MR. LEBLANC:** The next submission is from Peter Tabuns, MPP Toronto-Danforth, CMD 18-H6.18.

**MEMBER BERUBE:** So a question here relating to public awareness campaigns, and basically that of the concerns of Torontonians and what to do in the event of a nuclear accident. Could you talk to how you actually address this? How do you educate the public? Where can they go for information? Where are you now and where are you going to go with this in the future?

**MR. BURNS:** Scott Burns, for the record.

I'll speak to this briefly, but I do want to emphasize that this is a shared responsibility with the province, the City of Toronto, the Region of Durham, and ourselves in terms of communicating with the community.

Over the last five years, we've invested millions of dollars in communicating with the public in our campaigns, starting in 2014 with our flashlight campaign and throughout with our KI distribution campaigns. Most recently, in the latter part of 2017, in partnership with our partners, the City of Toronto and the Region of Durham, we distributed another communication strategy out to the detailed planning zone residents and businesses talking about KI distribution and what to do in the case of an emergency.

We have a comprehensive public information program with elements such as our public information centre, community councils, and quarterly newsletters which are delivered to the surrounding communities.

I mentioned our partners. Over and above the campaigns, we all have websites that talk about emergency planning in the case of a nuclear emergency and how to obtain KI pills. They also give information about public alerting and other protective actions.

I will say that the Ontario Ministry of Health and Long-Term Care provides information through various provincial health communication channels as well. Information is available on Telehealth Ontario, Toronto 311, Durham MDs, and the Durham helpline operators.

As I mentioned, we work closely with our partners. We are aware that residents are visiting the websites for the province, for the City of Toronto, and for the Region of Durham to get this information. We are committed to continually investing in communication strategies to ensure that the public knows what to do in the case of an emergency.

I should mention from time to time we poll to see how successful we are. We have been successful. The indications are in the 80 percent retention level, so we feel confident about it, but we still feel we want to do better and reach out to more residents and do our best to ensure that they retain the information, so we will continue to invest in those strategies as a company and working with our emergency service partners.

**MR. LOCKWOOD:** Randy Lockwood, for the record.

This speaks to our first commitment to the Commission, that we will uphold nuclear safety. Really what I would just like to say is that, of all the things

that Mr. Scott Burns just said, I want to leave the Commission with we will continue to work with our off-site partners to raise awareness with the use of our website, our community information sessions that we hold annually, our community advisory committee, tours, et cetera, newsletters. We will continue to do that.

**MEMBER VELSHI:** I think we're going to get to these interventions later in the week, but there were other polls that were submitted that didn't show the 80 percent as a level of awareness, but we can park it until we get to those interventions.

Thank you.

**THE PRESIDENT:** Just to add to that, whether we're talking about communication within the zone, the contingency zone or the 50 K zone, is going to be something we'll be discussing over the next few days, because that's the big issue as to what are you polling, so this is like a heads-up. Get ready for it.

**CMD 18-H6.19**

**Written submission from the  
David Suzuki Foundation**

**MR. LEBLANC:** The next submission is from the David Suzuki Foundation, CMD 18-H6.19.

**MEMBER LACROIX:** Yes, I do have a question on this submission. It says on the second page, the paragraph with the largest numbers, I'll read it, I'll quote it:

"We understand that last year the station killed some 25,000 kilograms of fish." (As read)

What does it mean? I'm confused here. Could anybody from staff, OPG or DFO tell me: is it a large number; is it a small number; is this number validated?

**MR. MANLEY:** Robin Manley, for the record. Maybe we'll start off. Raphael McCalla will provide a more detailed analysis, but this is something that has been reported previously on, and it's talked about in our commission member document, so it's not news in that sense.

Raphael, I'm going to turn it over to you to sort of set the context with respect to our historical practices and our target that was established for an 80 percent reduction in impingement, and how successful we've been with our fish diversion system over the years in meeting that target.

**MR. MCCALLA:** Raphael McCalla, for the record.

I'll start off by saying that Pickering Nuclear's environmental program is protective of human

health and the environment. The program includes the monitoring and mitigation of potential impacts to the aquatic environment. Mitigation includes the deployment of a fish diversion system which consists of 2,000 linear feet of net which traverses the cooling water intake channel to minimize fish impingement. In 2012, the CNSC accepted this system as appropriate for mitigating any incidental impacts.

As was mentioned earlier, in January of this year, Fisheries and Oceans Canada issued a Fisheries Act authorization for the facility, and in so doing acknowledged the fish diversion system as an appropriate mitigation for impacts to fish.

As Mr. Manley indicated, the fish diversion system has performed very well since being employed. It started in 2010. It consistently meets the 80 percent reduction, which was established back in 2008 by the CNSC.

Following the removal of the fish diversion system in November of 2017, approximately 1,500 kilograms of age one equivalent fish were actually impacted, so the question with respect to 25,000, it's actually equivalent to 1,500 kilograms of age one fish, which in this particular case they were really small, small fish so to speak.

OPG reported the event to Fisheries and Oceans Canada, and we conducted an investigation. The investigation was completed and the results of that investigation were communicated to the CNSC, as well as Fisheries and Oceans Canada. The investigation concluded that the cause of the event was attributed to rapid changes in the near shore lake environment, specifically sudden changes in lake temperature, current direction and speed. While this phenomenon is not well-understood, it has been observed that these rapid changes can initiate this type of episodic event that was experienced during that time, but OPG continues to learn from events like this, and going forward, we will look for opportunities to see if there's anything that we can do as a result of this event to prevent recurrence.

**MEMBER LACROIX:** Thank you.

**THE PRESIDENT:** We will talk about that subject throughout the four days. I was going to bring DFO to the table, but I --

**MR. MCALLISTER:** Dr. Binder, I could maybe put that into some context, though.

I'm sorry. Andrew McAllister, Director of the Environment at the Risk Assessment Division.

As Mr. McCalla mentioned, he was referring to a specific species. Alewife is a ubiquitous species in

Lake Ontario and quite common. To give you an idea of the numbers we're talking about, a 2012 alewife population estimate was around 191 million of yearling and older fish have a biomass estimate of 5,577 metric tons, so it is a common species. The amount that was involved in this incident was low, though still not trivial, and one that we may have to follow-up on, but in a sort of population context it was a very minor amount.

**MEMBER LACROIX:** Thank you.

**THE PRESIDENT:** Thank you.

We are going now to break for dinner.

We'll reconvene at 6:30 p.m.

--- Upon recessing at 5:39 p.m. /

Suspension à 17 h 39

--- Upon resuming at 6:26 p.m. /

Reprise à 18 h 26

**THE PRESIDENT:** Ready? I am going.

We are back.

The next presentation is by Ms Dahl as outlined in CMD 18-H6.59. The floor is yours.

**CMD 18-H6.59**

**Oral presentation by Kirsten Dahl**

**MS DAHL:** Hello, Commissioners. Thank you for the opportunity to speak today about Ontario Power Generation's 10-year licence renewal request for the Pickering Nuclear Station.

Public consultation in open and transparent hearings such as these is a very important condition of licensing and I, for one, feel an obligation to be here today.

Given that the public takes on the risks associated with this station's continued operation, we should be playing an active role in the decision-making process and able to access information we need in order to make a decision about what constitutes acceptable risk without undue burden.

I am here today to urge the Commission to reject the licence renewal application and direct the province and the licence applicant to undertake measures to substantially improve off-site nuclear emergency planning.

Continuing to operate this station beyond its design life is ill-advised for a number of reasons which I outlined in my primary written

submission and were repeated by a number of other intervenors.

My primary concerns are the unacceptable risks that the continued operation of this plant poses to public safety and the environment.

For this presentation I would like to focus on an issue that, as a resident of downtown Toronto, I feel I am qualified to report on to the Commission; that is, the adequacy of nuclear emergency plans beyond the primary zone and the measures taken to inform the public of what to do in a nuclear emergency.

I live less than 30 kilometres from the Pickering Nuclear Station and I've never been advised of what to do in the event of a nuclear emergency.

To my knowledge there's never been a study of whether Toronto can be evacuated quickly and safely or even what impact a major accident would have. There hasn't even been an attempt to let GTA residents know that there are nuclear reactors very close to our borders that I know of.

Given that people living within 30 kilometres of Fukushima had to evacuate following that disaster, I find it surprising that we seem to be kept

in the dark.

Most of my neighbours and colleagues have no idea that we live this close to a nuclear station or what KI pills are for that matter.

For those of us living beyond the 10-kilometre primary zone awareness of what to do in the event of a nuclear emergency is almost non-existent. Even finding this information is a challenge.

OPG notes that, and I quote:

"Information about emergency preparedness and KI pill distribution is widely and easily available to the public".

(As read)

It's extremely easy to make information widely available, but that doesn't mean that people will find it.

The hub of information on nuclear emergency planning, as you know, is the website Prepare to be Safe and on this site we are told that in the unlikely event of a nuclear emergency to go inside, turn on your radio and follow instructions, and this could include taking KI pills, sheltering, evacuation or reporting to a reception centre, as you

all know.

These actions are really only effective if you're prepared in advance. And what if you haven't ordered your KI pills, and given that 38,000 people have ordered these pills from the website, that leaves quite a few people without them.

What structure makes an adequate space to shelter? Where do you find your closest emergency shelters or decontamination centres? What are the evacuation routes? None of this information is on the website and I can't seem to find where it is.

They have, however, helpfully included in the FAQs, can I give KI pills to my pet?

I used to live in Taiwan and Taiwan is a country that is vulnerable to many hazards including typhoons, earthquakes, tsunamis and the threat of military invasion and the prevalence of these natural disasters have influenced emergency planning on the island and, as such, is top of mind to Taiwanese people. Pertinent information is given regularly to residents, signs indicate evacuation routes and they have regular drills where schools and entire cities will participate.

I am by no means an expert on emergency planning in Taiwan, but I can speak to my

experience living there and I felt more prepared for an emergency there, not being able to speak the language or read the brochures or the signs, than I do living in Toronto.

I can't help but think that since we haven't experienced a major nuclear disaster here we haven't quite acknowledged that it could happen and we haven't prepared adequately.

I've read OPG's supplementary response on emergency planning which covers protective measures taken within the primary zone arguing simply that they are compliant with current regulations.

This response doesn't satisfy my concerns about how a safe evacuation would occur in Toronto given the state of our transit and the public's lack of knowledge of evacuation procedures.

It also focuses almost entirely on highly complex on-site safety plans while ignoring basic questions on what those who live outside of the primary zone would do in the event of a nuclear emergency.

The failure to share this about the impact of a major accident and what to do in such an instance represents a failure to prioritize public safety for those living outside of the 10-kilometre primary zone.

I do believe that this is a major failure of the new PNERP.

I have focused my 10 minutes of fame here on my experience as someone who lives downtown Toronto and feels quite unprepared for what to do in a nuclear emergency, but I also wanted to highlight that I share a number of concerns with other intervenors including the Toronto Environmental Alliance, the Canadian Environmental Law Association, Greenpeace, Lake Ontario Waterkeeper and Northwatch regarding what I would classify as a weak approach to protecting the environment.

I'm particularly concerned that there hasn't been an environmental assessment for the decommissioning of the plant including what is the long-term solution for radioactive waste and that there is no adequate plan for how to clean up our supply of drinking water in Lake Ontario should an accident occur.

I'm very pleased that Toronto City Council is prioritizing public safety and has requested that the Canadian Nuclear Safety Commission strengthen off-site nuclear emergency preparedness at Pickering, expands the distribution of KI pills beyond the 10-kilometre primary zone and implement a

meaningful public awareness campaign in the GTA.

In addition to supporting these recommendations, I would add the following reasonable requests.

Ensure closure plans for the Pickering Station are subject to a federal environmental assessment before a decommissioning licence is granted;

Undertake measures to ensure that public participation in licensing processes are transparent, meaningful and a condition of a new licence;

And require contingency planning for an alternative source of drinking water should Lake Ontario be contaminated;

And demonstrate that our precious water source can be cleaned should an accident occur.

This should be done before a licence is considered. And I hope you don't mind today if I take advantage of this opportunity to be here and ask the Commission this final request to OPG.

So, my question to OPG is, if there is a severe radioactive contamination of Lake Ontario, what is the alternative source of drinking water for 9 million people who rely on this, and how do you plan

on cleaning up the lake?

Thank you very much for inviting my comments and considering these arguments in your decision.

**THE PRESIDENT:** Thank you.

Question?

**MEMBER LACROIX:** Yes, I do have a question.

**THE PRESIDENT:** Go ahead.

**MEMBER LACROIX:** Thank you very much Mrs. Dahl for sharing your concern with us.

On the first page, third paragraph, last sentence, you say something which is troubling. I read it:

"... and more recently last year, when workers at both Darlington and Pickering nuclear facilities were pulled off their jobs due to a "concerning trend of safety incidents"."

Could OPG comment on this, please?

**MR. GREGORIS:** Steve Gregoris, for the record. I'll start with our commitment that we outlined during our presentation specific to nuclear safety, and that specifically is that safety of plant

personnel, the public and the environment will be assured at all times.

Specific to this statement, as you can appreciate, nuclear power plants have to be operated to very high standards. We monitor how we're operating those plants very carefully and we ensure that we're operating to those high standards.

In this specific case we saw some lower level events that would indicate, specific to safety, we weren't meeting those standards in the fashion we would like. Specific to that, we wanted to grab hold of the organization, make them aware and make sure we changed our approach to meet those standards and in that way we did a full stand-down at both the Pickering and Darlington sites to make sure the point of operating to high standards and, in particular, in this case safety standards was front of mind and to recalibrate the organization so that we operated to those high standards going forward.

That is a typical practice we use in the industry to ensure, again, we continue to operate and maintain those plants to very high standards.

**MEMBER LACROIX:** Have these incidents been reported to CNSC, this specific incident?

**MR. MANLEY:** Robin Manley, for the

record. So, the specific incident that's being referred to here was initiated at our Darlington refurbishment and that has been discussed in front of the Commission and, in fact, I did speak to it myself, as has our Darlington refurbishment Director of Ops and Maintenance, Boris Vulcanovic.

And just to echo Steve Gregoris' remarks, you know, we view this as a positive proactive action relating to our healthy safety culture to identify these things in advance and take an action before someone is actually injured.

**MR. LOCKWOOD:** Randy Lockwood, for the record. It was me who made that decision on September 29th, so I think I should weigh in here.

A stand-down is a tool in our toolbox. You could have a stand-down within a shift, you could have a stand-down in a department, you could have a stand-down for the entire site.

As Mr. Gregoris outlined, it's a proactive move. It's common in the industry. You start to see some trend that you're not particularly pleased with, you take action, proactive action.

The idea here is the staff stop and with the company and the supervision you reflect on what's happening and what we can do different going

forward.

On September 29th it was us, it was me to decide we'll shut down or we will stand-down the entire site of Pickering and it was for the right reasons. As I said earlier, concerned about lower level events escalating and someone getting hurt.

Now, please bear this in mind. At that particular time, you know how large Pickering is, 600 acres, thousands of staff, we had an all injury rate of zero and we finished that year with an all injury rate of 0.06. Unheard of in the industry. And why? I'll tell you why I did that because I cared about the people and will do it again, if necessary. But the real thing here is they weren't pulled off the job. As it kind of implies, it was proactive to ensure people are not hurt. And it's common in the industry, if it's required.

**MEMBER LACROIX:** Thank you. Staff, care to comment, please?

**MR. FRAPPIER:** Gerry Frappier, for the record. So first to be clear, it was not like there was a safety accident or injury or anything of that nature. The OPG keep track of much lower level indicators such as seeing somebody working at height without appropriate fall arrest equipment.

And I would concur with OPG that it is considered a best practice that if some of those things are starting to creep into work habits to have management ask everybody to stand-down from their work, reflect on what's going on, presumably have some discussions with supervisors and that to ensure that everybody understands that meeting all the safety requirements and safety rules is expected of their job.

So, it was reported to the CNSC as a stand-down, but again, it wasn't because there was any incident that needed to be reported to the CNSC, it was because management at OPG had decided this was the best course of action to prevent anything that would have to be reported.

**MEMBER LACROIX:** Thank you.

**MEMBER PENNEY:** Thank you, Ms Dahl. I'm going to jump to -- you said you're concerned about the weak approach to environmental protection and you do mention that in your written submission. I wondered if you could give us a little bit more detail around that, I'd appreciate it. And then I'll ask CNSC staff to comment.

**MS DAHL:** Kirsten Dahl, for the record. There are several -- I have several concerns

about what I would call the weak approach to protecting the environment, but I'll stick to maybe two major ones which is, what is the plan for -- what's the long-term plan for the radioactive waste?

I know that there is discussion of a DGR, but the location hasn't been set and there's been a huge opposition from local communities in the States and across Ontario.

And so, I think that if we're considering shutting this plant down originally very soon to now, that that plan should already be in place. And, as we all know, this radioactive waste will last for a very long time, it will be our grandchildren's children taking care of it. And so, I just find it unbelievable that we don't have a plan for that yet.

So, that would be my major concern, what are we doing with the radioactive waste considering First Nations and, of course, thinking that we need their consent and too often these radioactive wastes end up in their communities.

And then my second really main concern is the drinking water for 9 million people that live on Lake Ontario and what happens if there is a major spill or contamination of our drinking water?

As far as I know, there doesn't appear to be a plan in the short term if there is an accident and also in the long term, can OPG then state that they can clean up the drinking water if -- Lake Ontario following a spill?

Thank you.

**MEMBER PENNEY:** Thanks. CNSC staff first and then maybe OPG.

**MR. FRAPPIER:** Gerry Frappier, for the record. I'd ask Madame Karine Glenn who's back in Ottawa to discuss a little bit about what the plan is for waste and, in particular, with respect to a closure of Pickering where the waste would go.

**MEMBER PENNEY:** And comment on the contaminated lake water?

**MS GLENN:** Karine Glenn, for the record. I am the Director of the Waste and Decommissioning Division at the CNSC.

So, I'll start off by saying that first and foremost all of the waste that is generated at the Pickering Nuclear Generating Station is currently being safely managed in two separate locations.

The first location is for the high-level waste, and that's the fuel, is being

managed at the Pickering Waste Management Facility which is located adjacent to the generating station, and that facility just underwent a renewal hearing in 2017 and the Commission just issued a 10-year licence for that facility which became effective on April 1st, 2018.

So, that's where the waste is currently being stored for high-level waste.

All of the low and intermediate-level waste that is generated through the operation of the station is currently being transferred to the Western Waste Management Facility which is located adjacent to the Bruce Nuclear Generating Station. That facility manages all of OPG's and Bruce's operational waste. And that underwent a public hearing also in April of 2017 and has currently a 10-year licence which was issued in May of 2017 as well for that facility.

The long term plan for the fuel is being managed through the nuclear waste management organization. This organization was created through the *Nuclear Fuel Waste Act* which the Government of Canada put in place to ensure the long term management of high-level waste and specifically of the spent fuel. And so through that, the utilities fund, that process and this organization, is being tasked with

locating a deep geological repository which was the solution that was selected by the Government of Canada for the spent fuel.

Currently, that is in the site selection process. There are five communities that remain in the selection process which is voluntary, out of 22 original communities who volunteered.

It does take a long time to site such a facility and that's partially because the NWMO is looking for a suitable site in a willing host community and is going through an extensive indigenous consultation and public consultation process in order to arrive at a suitable site that is not only safe from a geological perspective, but also with a willing and informed host community.

So that right now, the planning assumptions for the operation of that DGR is 2043 is when it would -- but that would need to undergo an environmental assessment under whatever the act is in place at that point in time, and also require licensing from the Commission.

With respect to low and intermediate level waste, OPG's plan for that is through a DGR located adjacent to the Western Waste Management Facility and that has undergone an environmental

assessment process and is waiting for a decision from the minister.

And subsequent to that there will be required a decision, a licensing decision from the Joint Review Panel, which was tasked with doing both the environmental assessment and the licensing.

Did I answer your question?

**MEMBER PENNEY:** Yes, thank you, Ms Glenn.

I had a question, a follow up question for OPG.

OPG, when would you require a deep geological repository for your fuel? We just heard that there may be one available in 2043.

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

I'll answer that question first, but then I will perhaps add on to what Ms Karine Glenn said, as far as the DGR for low and intermediate level waste.

So with respect to when we require a DGR for the fuel, the current in-service date from the NWMO of the 2040's works perfectly fine within our planning. So we do long-term system planning and forecasting. And last year when we came forward for a

10-year licence renewal for the Pickering waste management facility, we ensured that we would have sufficient capacity to store all of the fuel up until the time that that DGR would be in service.

So the current licence that we have with respect to some additional storage capacity at that site will be sufficient to get us through to the 2040's.

Just to add on a little bit to what Ms Glenn said with respect to the DGR, and she definitely covered that very well -- I just want to indicate that as Ms Glenn indicated, the deep geological repository project for low and intermediate waste is currently in the EA approvals phase, and last August we received another letter from the federal Minister of Environment and Climate Change that requested that we update our analysis and provide some information with respect to the spiritual and cultural connection to the land of Saugeen Ojibway Nation in which their traditional territory is located -- or sorry, the Bruce site is located within their traditional territory.

So we are working with Saugeen Ojibway Nation now and we remain in a very meaningful and respectful engagement with Saugeen Ojibway Nation. We

committed to them in 2013 that we would not build that repository without their support, and we remain steadfast with that commitment.

**MEMBER PENNEY:** So is it fair to say you're still in the environmental assessment process for that facility?

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

Yes, that's correct.

**MEMBER PENNEY:** Now, we haven't heard about contaminated lake water.

**MR. FRAPPIER:** Gerry Frappier, for the record.

So just back to the waste, there is a plan for all the waste. Some of it takes a bit of time as far as final solution goes. All of it is being managed right now to the requirements so that it is kept safe until the final repositories are ready.

With respect to the potential secondary kind of drinking water, there is no credible scenario that would contaminate all of Lake Ontario. However, there is plans in place with respect to if there was a short-term problem, if you like, or a problem around the site from a release.

And to give a bit more detail on

how -- and it might be better later on when the province is here, but how the province manages the drinking water supply, I would ask Mr. Richard Tennant to comment on that.

**MR. TENNANT:** Richard Tennant, for the record, Emergency Management Program Division.

In the PNERP they identified the Ministry of Environment and Climate Control as having the oversight over drinking water from the lake. They do exercises when we have exercises, full-scale exercises. The Ministry of Environment does actively participate in the provincial emergency operation centre.

I can't speak in as much detail that the province will be able to about what the Ministry of Environment does, but I can tell you that they are there to support the drinking water system needed during a recovery phase, and to identify municipal and non-municipal drinking water systems that are regulated under the *Safe Water Drinking Act* from the province. So it's their responsibility to ensure that the drinking water would be a secondary source and could come to the table. And they do exercise this routinely at the PEOC.

**THE PRESIDENT:** I think we should wait

until they'll be here, I think tomorrow, and then we will pursue it further.

Some other questions? Ms Velshi...?

**MEMBER VELSHI:** I did want to follow up on your response to the waste or the used fuel longer term disposal answer.

So in the event that the DGR for used fuel is not available in the mid 2040's or not for another 20 or 40 years after that, do you need additional contingency plans to look after the used fuel that is currently or would be on the Pickering site?

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

So again, considering the Pickering shutdown date of 2024, of course our plan then is to -- the fuel needs 10 years to cool in the bays before we can move to dry storage and then, therefore, we would have the bays emptied. The planning right now is by 2035, and then to dry storage.

So then if you were to speculate that for some reason the used fuel DGR was to be delayed by those kinds of decades, then we could, although we don't -- certainly I just want to emphasize NWMO is very much on track with their site selection process

and those dates are looking very feasible, of course, pending EA approval.

But we certainly can continue with ongoing storage. We can manage the integrity of the DSCs. We have a very significant aging management component to ensure that they maintain their integrity, and we certainly could continue a longer term safe storage on site.

**THE PRESIDENT:** Thank you. Questions? Dr. Demeter...?

**MEMBER DEMETER:** Thank you. Thank you for your presentation.

This is a question for staff. The intervenor on her last page talks about siting of nuclear reactors near large populations and talking about international safety standards. Are there international safety standards that deal with proximity of nuclear power plants operating to populations or new builds that have certain guidelines for proximity or sparsely-populated zones around them? Is this an evolving new set of standards?

**MR. FRAPPIER:** Gerry Frappier, for the record.

There is a siting guide associated with new build, if you like. It's not really written

in the way that, as described here that would be like dependent on population density.

The designer has to show what is the potential offsite consequences. There is requirements around ensuring that the people or that might live at the edge of the fence, if you like, of the facility would not be -- would not have health issues if there was accidents or whatever the case is, but that can be very dependent on the design of the nuclear power plant. So there isn't something that says you can't put a nuclear power plant around a population of whatever people might think Pickering is.

And for more detail on that, I'm trying to think of who -- are you going to answer that, Alex?

**MR. VIKTOROV:** Alex Viktorov, for the record.

Mr. Frappier is correct. National or international, there are no definitive quantitative numbers for site and facility like so many kilometers from a population centre of a certain size. It's rather to be able to demonstrate the whole set of requirements, design requirements. Emergency preparedness and response requirements can be met to conduct various assessments, and various

decision-making authorities and the public would provide input in making the decision.

Again, in the particular case of Pickering facility, we do verify that all the requirements we have in Canada can be met to conduct emergency exercises, assessment verification time, and so on. Again, all the current requirements in place have been met.

**MR. JAMMAL:** It's Ramzi Jammal, for the record.

Dr. Demeter asked a question on international benchmarking. To complement my colleague's answer with respect to the process itself, what we currently know of new build, construction of a new build is taking place in Asia where the highest density of the population does exist. So there is no restriction as such, for example, in Bangladesh, India, China, several places where they take into consideration the offsite consequences and the capacity of the whole deterministic and the whole offsite response.

So on the international benchmarking process there is no restriction as long as the local governments and the operator is capable to deal with an off-site consequence.

But if we take Bangladesh where they are building a reactor where the population density is in thousands per square kilometre, the key point here is the capability of providing protective measures and the response in the case of an emergency.

**MEMBER DEMETER:** I will reserve my other questions for the people to talk about our population density and evacuation plans.

**MEMBER VELSHI:** So on the population density, can you comment on the Joint Review Panel for the Darlington new build environmental assessment? Did they not make a recommendation that the province should come up with some kind of a policy on restricting development around that?

And if the driver is that so long as you can demonstrate under any credible scenario that you have adequate emergency response, why would they have had that as a recommendation?

**MR. FRAPPIER:** Gerry Frappier, for the record.

So that is correct, that out of the Darlington new build there was discussion, and we were directed to go talk to the province with respect to land planning and how they do that.

We did meet with the provincial

authorities who did modify their policy with respect to land planning to ensure that they are taking into consideration significant infrastructures, including nuclear power plants.

So that is in place and it is in place certainly now at Darlington Municipal. I'm not 100 per cent sure about Pickering, but I will find out.

So from that perspective there is a necessity for them to take it under consideration again.

From our perspective, from a siting perspective, we want to make sure that everything is contained within the protected area of the plant as the plant design requirements.

**MR. JAMMAL:** Just to complement, Mr. President.

Madam Velshi, your question with respect to the recommendations of the panel, they did recommend to look into potential future expansion.

However, we cannot leave the fact that there is always an exclusion zone as part of the design basis with respect to deterministic effect for the site itself.

So the exclusion zone is an exclusion zone.

And there is of course the ten kilometres, 20 kilometres and so on and so forth.

Our experience has been is there necessary future challenges that might come in as the population grows towards a nuclear facility? Let me be more general because we have quite a bit of non-nuclear power plants that they are categorized as a nuclear facility, and there is always the fear and unacceptability of having a nuclear facility.

I'm going to name one: is MDS Nordion. There is no emissions. There is nothing being done. And there was a proposal to build a school.

Our advice was save yourselves a lot of headaches in the future and let the planners determine that there is a nuclear facility, even though it's not a nuclear power plant. But for them to take that into consideration.

So it's more of an awareness issue.

But the requirements under the CNSC, you must have an exclusion zone. That's one element.

And we are not finished yet with respect to the off-site consequences in Pickering post-Fukushima, what we imposed on the licensee to put in place with respect to make-up of a heat sink or cooling of the water. There is a continuation with

respect to the enhancement to the existing filtering.

All these things have reduced quite significantly the off-site consequences. But the exclusion zone, as Dr. Demeter asked in questioning, does exist for every design.

**THE PRESIDENT:** My understanding is you are about to release a document about site planning, and I thought in that site planning you will deal with some of those exclusion zones or population around a facility and how to deal with that.

**MR. FRAPPIER:** Gerry Frappier, for the record.

That is correct. There is some new siting REGDOCs that are coming in. But as I mentioned, it provides not so much something that would say a site like Pickering could never have any kind of nuclear facility because there's people who live around it but more of a how you analyse to ensure that it meets safety requirements.

**THE PRESIDENT:** Okay.

Mr. Berube.

**MEMBER BERUBE:** Thank you for coming and having the courage to talk in front of the Commission. It's a daunting experience.

It's a personal question but it's

really critical, and it has to do with communications and strategy.

When you started this process of trying to figure out what do I do as a private citizen, could you explain how daunting that is?

Obviously you are IT savvy, you are intelligent and you are driven; otherwise, you wouldn't be here.

So how long did it take you to basically get some form of information that was useful to you? And where did you get to with that?

It's pretty critical for us to know how effective communication strategy is right now.

**MS DAHL:** Kirsten Dahl, for the record.

When I moved to Toronto I had no idea that there were ten reactors so close to us. I think for most people in this room it's just we know much more about these things than the average citizen. So I think we need to be very cognizant that most people that live in the GTA, their level of knowledge about not even what to do in a nuclear emergency but there are reactors and what steps are being taken to protect us.

I think our knowledge is just

extremely low. And that's not just, you know, citizens but it's also government officials and people that we assume would have a decent knowledge of these things.

I guess to answer your question, for a long time I had no idea and you know, there's only so much that you can find out online. Once I learned about the issue, I'm an environmentalist so that's how I sort of got into researching it. As I said earlier, I'm concerned about our drinking water and the radioactive waste.

The more I looked into it, the more concerned I became about our safety plans and how little people actually know.

So maybe the level of knowledge is quite high if you live in Pickering or near Darlington, but I think once you are beyond that ten-kilometre zone there is really no public outreach.

You can find a couple of websites that take you nowhere basically. So I think there needs to be much more meaningful public outreach, and that doesn't just mean posting something on a website but it means, you know, going through schools, a more comprehensive public awareness campaign that would reach people who would otherwise not just look for

this information.

**THE PRESIDENT:** I hope you will either be here or stay tuned, I think for tomorrow where we are going to ask the Office of the Fire Marshall to answer some of those questions about where can you find easy to understand, easy to find information about what to do.

Any other?

So any final thought you want to share with us?

**MS DAHL:** Kirsten Dahl, for the record.

Yes, I wanted to just briefly respond to a couple of the comments that were made today.

I highlighted the issue of the workers being pulled off the jobs in I think it was Pickering and Darlington, or just one; I'm not sure. I highlighted that because it's just an example of what could go wrong and that accidents do happen and that mistakes can happen.

I applaud you pulling the workers off the job. Of course, that is expected actually.

So I was just highlighting that; that something could go wrong and we don't know what that could be maybe ten, 20 years down the road.

So OPG's assurances that they will be able to manage this waste and continue to operate without incident, I just don't take that as a given.

Mr. Frappier, I just wanted to touch briefly on your point about what would happen if there was a spill in Lake Ontario.

Your response was that it would be a short-term problem and that it wouldn't contaminate the whole lake.

That's not good enough.

So thank you very much for inviting me to comment again and for taking my thoughts into consideration.

**THE PRESIDENT:** Thank you.

The next presentation is by Teachers of Toronto District School Board and the Toronto District Catholic School Board, as outlined in CMDs 18-H6.101 and 6.101A.

I understand that Mr. Montemurro and Ms McCarry will make this presentation.

Over to you.

**CMD 18-H6.101/18-H6.101A**

**Oral presentation by**

**Toronto District School Board and the**

**Toronto District Catholic School Board**

**MR. MONTEMURRO:** Good evening. My name is Anthony Montemurro and I am a teacher with the Toronto Catholic District School Board.

I am joined with Cynthia McCarry from the ETT.

Firstly I would like to thank everyone for giving us the opportunity to speak here today.

I work at Monsignor Fraser College in Scarborough. I am not here as a representative of the Toronto Catholic District School Board; I am here on behalf of my students.

I am no expert on issues relating to nuclear energy. My expertise, however, is the wellbeing of the youth I serve.

As an educator I have several roles and priorities. Besides providing an education and preparing my students for post-secondary institutions and the workforce, another extremely important priority I carry is the health and safety of my students.

I am here to continue this commitment of the health and safety of our children. I hope that we all share this commitment and that we value their health and safety.

In schools we prepare our students in the event of fire. We prepare them for lock-down drills. Tonight we are seeking to prepare and protect our children in the event of a nuclear emergency.

Therefore, we see it necessary to stockpile potassium iodine pills in schools within 50 kilometres of the Pickering and Darlington Nuclear Stations.

My school, Monsignor Fraser College, is located 17 kilometres from the Pickering Nuclear station. The problem we have are unequal levels of student safety. Since 2016 KI tablets have been pre-stocked in all schools within 50 kilometres of the Bruce Nuclear Station. Parents have also been provided information on the potential need to administer KI in the event of an accident.

So this is the problem. We don't have equal protection for Toronto students. There are over 580 schools within the Toronto District School Board, totalling 250,000 students. Within the Toronto Catholic Board we have 196 schools with over 85,000

students. We have 11 Conseil scolaire catholique MonAvenir Toronto-area schools, and seven Conseil scolaire Viamonde Toronto-area schools.

**MS McCARRY:** Cynthia McCarry, for the record. So TDSB request for KI stockpiling. Therefore, be it resolved that the Board communicate with the CNSC with the request that OPG stockpile potassium iodine pills in TDSB schools located within 50 km of the Pickering and Darlington nuclear stations.

I'm happy to announce that TDSB approved a motion to stockpile KI pills in our schools last Wednesday. I have a photocopy of it here.

The Teachers' union, ETT, also requests for KI stockpiling of the pills. Now, be it resolved that the ETT requests the TDSB, the CNSC, and the Government of Ontario collaborate and ensure the stockpiling of KI in schools within 50 km of the Pickering and Darlington nuclear stations.

ETT had also approved a motion to stockpile these pills in our schools two weeks ago. Again, I have the letter in my hand.

The City -- Toronto's support for protecting vulnerable communities, and expanded KI distribution as well. The City has requested this,

that motion has also passed. The City also supports transparency, public consultation, funding, strengthening emergency preparedness wherever feasible, protection of vulnerable communities and world class public safety.

So it looks like TDSB, ETT, the union, and the City has approved these motions. The fact that this has happened indicates that this is a very important step in ensuring the safety of our students, and that's what we are here to request.

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

**MEMBER VELSHI:** So thank you for coming. Is the driver for this recommendation or these motions because Bruce Power has pre-distributed KI pills in the 50-km zone or do you believe there is a risk, that your students need to be protected against? Because, if you have looked at the Provincial Nuclear Emergency Response Plan, they don't see any scenario where that would be really necessary. You can always ask for those pills if you need it.

But I just wanted to understand, what's the motivation? Is it because you want equality of treatment of students, and Bruce has done

so, and that's why you think you need it?

**MS McCARRY:** Cynthia McCarry, for the record. We believe that everybody, all our students, our own children, yes, have -- it's about fairness, right? I be that everybody, all the students, should have it. It's not because Bruce has it, right? I don't think 10 km is good enough. As Anthony said, his school's very close, mine's a little bit further, but anything can happen. Accidents happen, right? We just want the safety of our students.

**MEMBER VELSHI:** So, in that case, why stop at 50?

**MR. MONTEMURRO:** Anthony Montemurro, for the record. That's a good point.

**MEMBER VELSHI:** So maybe I can ask Staff to comment on where the 50 km comes from. We've had many interventions talk about 50 km and how it's almost a best practice. What brought Bruce to do that?

**MR. FRAPPIER:** Gerry Frappier, for the record. I'd ask Mr. Richard Tennant to discuss about the other jurisdictions and where they are with 50 km.

**MR. TENNANT:** Richard Tennant, for the record. The Provincial Nuclear Emergency Plan currently defines the IPD to 50 km, the ingestion

planning zone. REGDOC-2.10.1 currently is the requirement for pre-distribution and stockpiling of KI. It identifies pre-distribution out to 10 km and stockpiling out to 50 km, with KI to be available within that 50-km zone to vulnerable members of the public.

Bruce Power has taken it upon themselves to exceed that requirement. So those are the current requirements, and OPG is meeting them.

**THE PRESIDENT:** But I thought there was another requirement that people are pointing to in CNSC REGDOC about dealing with schools. So stockpiling -- I can see stockpiling in rural communities, like Bruce, would be different than Toronto. But I thought there was a requirement for stockpiling in schools, which was over and above just make it available.

Tell me if that's not a requirement. Because many of the intervenors are actually making that statement. If you look at the second page here:

"In line with the need to protect children of greater distance, the CNSC post-Fukushima care distribution requirement includes a provision requiring," (As read)

et cetera,

"to make available to the  
sensitive population..."

(As read)

So it's a slightly different language  
here.

**MR. FRAPPIER:** Gerry Frappier, for the record. So I believe the requirement is that there has to be a plan with respect to how it's going to be made available. We don't dictate how that plan's going to be.

In the case of Bruce, they've decided that it's better to put it right at the schools, that it's pre-distributed to the schools. OPG could decide to do that, or the Province, whoever is responsible for that station. But from our perspective we're saying that for the 50-km zone there must be enough stockpile, must be a plan for how it's going to be distributed.

**THE PRESIDENT:** OPG, why wouldn't you, at least to the school board, I don't know if have the schools, but to the school board, would you not go the extra mile, so to speak?

**MR. LOCKWOOD:** Randy Lockwood, for the record. I'm going to ask Scott Burns to speak to this

topic. There was a number of questions, and maybe he can draw some of it together. Scott?

**MR. BURNS:** Scott Burns, for the record. So a lot of points in discussion here, so I'll try and bring OPG's perspective.

First of all, safety is a number one priority for OPG, and the safety of people in our regions and surrounding communities are also our priority, including vulnerable persons and children.

As mentioned, the strategy is a provincial jurisdiction for delivering KI. As stated earlier, before I get into some of the meat of this, I do want to say that beyond the 10-km zone, since 2015 we've had the Prepare to be Safe website where, as Mr. Gregoris mentioned earlier, anybody can go on and order those pills.

But I think what we're talking about is a strategy and changing the overall strategy which is dictated by the Province, and they may want to speak to this as well.

Obviously, OPG and the municipalities are key stakeholders in this, and the Chief Medical Officers of Health for the Province and local Chief Medical Officers would have a say. So OPG would not generally make a unilateral decision on the strategy

without consultation with those partners.

Just a little note about my limited knowledge about the Bruce strategy. If you've driven the Bruce community you'll know that they experience a lot of road closures with inclement weather in the wintertime. The potential for closing roads is more significant in their area due to weather than ours, and I think my understanding is that's part of their rationale, but they would have to speak to that.

However, generally with an evacuation scenario, which is highly unlikely, families would want to reunite with their children fairly quickly. If there wasn't road closures, they would probably reunite with their children very early on in a scenario like that which, again, is highly unlikely.

I will state that, as mentioned, the Provincial Nuclear Emergency Response Plan sets out the requirements for the distribution of KI, specifically to residents and businesses in the detailed planning zone, which we have done.

We also have a New Neighbours program in partnership with Canada Post. So anybody coming new into those zones, three times a year we deliver pills to people that are new into that zone to make sure that everyone in that zone is receiving them.

Going back to the PNERP planning process. So it was just revised in 2017, as you know, the master plan. It is in line, as mentioned, with international standards. The detailed planning zone is the current zone. Again, the Province will want to speak to this, but they are, as mentioned in Part 1 of the hearings -- they have undertaken to do a further technical study that will address some of these issues around zone sizes and protective actions.

As OPG has supported the new updates to the PNERP and intend to implement all of those, we're closely watching the results of that technical study as well. If there's any changes or recommendations coming out of that study, it would be our position to implement those recommendations.

**THE PRESIDENT:** So I think to have an intelligent conversation we need the Province here, and I think that's not going to happen until tomorrow. So I hope you can actually tune in or come back. Those issues have been raised by many intervenors, and we will address them when they're here and we can have some good conversation.

Do you want to add anything to that?

**MR. BURNS:** Yes. Scott Burns, for the record. I should state that our strategy in and

around the Pickering plant does include the assessment of the vulnerable persons, particularly pregnant, breastfeeding women, and children. So we have 6 million pills stockpiled between the 10-kilometre and 50-kilometre zone to ensure that people in the ingestion planning zone are protected in the unlikely event of an emergency. So it's not like we -- there's not a plan for that, the province has taken that seriously, as has the City of Toronto, the Region of Durham and OPG. The real question is, are we safe and are we prepared, and we certainly are.

**THE PRESIDENT:** Dr. Demeter...?

**MEMBER DEMETER:** Thank you. A quick question for the interveners. Thank you for your presentation. You are speaking as groups of teachers. Do you have buy-in by your boards, because there's going to be a lot of logistics for stockpiling, making sure it is renewed on a basis, keeping sufficient numbers, dealing with parents and consent, kids with iodine allergies, all these kinds of things, from that point of view? Like this is driven by the teachers, but unless you get buy-in by your administrators and managers at the school board, I'm just curious how would you pull this off?

**MS McCARRY:** Cynthia McCarry, for the

record.

The fact that TDSB has approved a motion, that is our board, therefore they -- that's the school board, yes, TDSB.

**MEMBER DEMETER:** Okay. I wanted to -- I didn't understand all the acronyms. And for OPG, obviously we are going to talk to PNERP, but obviously PNERP has directed you on how to deal with stockpiling beyond 10 kilometres. So from your understanding, from where you sit, how would you get KI pills from where you are stockpiling it to a school? I want to see if you actually understand where the stuff is being stockpiled and how it would get to vulnerable populations. Even though it is a PNERP responsibility, they have probably directed you where to stockpile and how much to stockpile.

**MR. BURNS:** Yes. Scott Burns, for the record.

So really what you are talking about is the actual execution of the plan in the event that it's required?

**MEMBER DEMETER:** Yes. So physically, where are these stockpiles?

**MR. BURNS:** So they are stockpiled in pharmacies throughout the area. Ministry of Health

has a significant quantity as well. Many of the health organizations are part of the planning process in terms of the execution of the plan and the distribution in the unlikely event that that's required. So it's all integrated into the health planning process and all of those plans are in place and would have been addressed as part of the exercise that we had in 2017 from a health perspective.

**MEMBER DEMETER:** Okay. And just a final comment because I think it's apropos to the interveners and comments have been made repeatedly that we pre-distribute in 10 kilometres, but that anyone that wants it after 10 -- beyond 50 can just ask for it. Well, I see this intervener asking for it. And I know there's all kinds of policy issues and how it integrates with the bigger plan and it's a much bigger ask, but there's those optics, right, anyone who wants it beyond 10 can just ask for it. This is an intervention that's asking for it and so it will have to be taken seriously.

**MR. BURNS:** Scott Burns, for the record.

So I receive your comments and I appreciate the comments. Again, safety is the number one priority. We are hearing -- we have heard this

sentiment throughout the hearings. In our evaluation of some of the intervener reports, we have heard that. We do respect the fact that it is a provincial jurisdiction and we can't unilaterally just make that decision, it has to be part of the provincial and municipal plans and regional plan. Again, we want this to be an evidence-based decision as well if we are changing the strategy. So my earlier comment about waiting for the results of the technical assessment I think is prudent for the organizations involved.

**THE PRESIDENT:** I think we will pursue this further when they are here. So unless there is a specific, different question? Is it a different question? Okay. So we will wait until -- because I don't even know what asking for it means. Who delivers it? Do you go in and purchase it? There are too many questions here that we will not be able to deal with until the Office of the Fire Marshal is here and some provincial authority. So I really think we should defer it for tomorrow.

**MR. LOCKWOOD:** Randy Lockwood, for the record.

I very much agree, President Binder, that we do need the province here and other parties to

properly address this. But I did want to -- I do want to stress that, as we said in our open presentation, we care about the community, so we want to see that we do the right thing here. And I echo what Mr. Scott Burns just said, is let's have all parties here, let's see what the technical study says, the evidence, and how best to execute, and not just go here and there.

**THE PRESIDENT:** Okay. Thank you. Anything final you want to say to us? So I hope you stick around for tomorrow.

So let's move on. I think that the next intervener is part of your partnership here, because I see a name on the signatories of schools, so I assume you're a teacher I'm guessing.

**MS BRUCE:** Yes.

**THE PRESIDENT:** So the next presentation is by Ms Bruce, as outlined in CMD 18-H6.33.

Ms Bruce, the floor is yours.

**CMD 18-H6.33**

**Oral presentation by Dominique Bruce**

**MS BRUCE:** Hello. My name is Dominique Bruce and yes, I am a teacher.

--- Public announcement / Annonce publique

**MS BRUCE:** Something about the change room.

**MR. BURNS:** They want -- there is an emergency in the fitness room.

**THE PRESIDENT:** Is there a doctor in the house, Dr. Demeter?

--- Laughter / Rires

**THE PRESIDENT:** Do we need to do anything? That's what I want to know.

**MR. BURNS:** There's a number of police officers here that are first-aid trained and security personnel that could probably assist Pickering staff.

**THE PRESIDENT:** So we don't need to do anything? I just want to make sure. No? Everything good? Okay. Thank you. So, Ms Bruce, the floor is still yours.

**MS BRUCE:** Thank you. My name is Dominique Bruce, I am indeed a teacher.

For the record, I am here today to ask the Commission to revoke the licence renewal of the old Pickering nuclear station as it is undeniably an unreasonable safety risk for the people living in Pickering, Toronto and the surrounding regions.

I am a deeply concerned citizen of

Toronto, a mother of two wonderful daughters and an elementary school teacher of over 30 years. I live and teach within 28 kilometres of the old Pickering station.

If we have learned anything from the nuclear accident at Fukushima seven years ago, it is that nuclear power is clearly an unreasonable risk that could cause catastrophic damage to the people of the GTA as well as poison the waters of the Great Lakes for the millions who depend on it daily. I believe this alone is sufficient reason to deny OPG's request to continue operating the Pickering nuclear station.

Your Commission, OPG and the province are responsible for the safety of everyone in the GTA in the event of a nuclear accident. We know without a doubt from the Fukushima accident that people at great distances may suffer or be deprived of their property in the event of an accident. Communities 50 kilometres from the Fukushima nuclear accident were evacuated. I live and teach less than 28 kilometres from Pickering and think that OPG and the province have been treating Pickering as only a risk to people next to the station. I think it should be treated by this Commission, OPG and the province as a threat to

all the GTA.

Everyone who lives in the GTA should have information about how to prepare for a nuclear accident at Pickering. Yet, there has been no information distributed. How would we all be evacuated? What is the plan? What should we do to keep our families safe, to keep our children safe whether they are in school or at daycare or even in our homes? My family and my school have been provided no such information.

The Pickering nuclear station operates in the middle of the GTA near millions of people. Toronto is known to have some of the worst traffic congestion in North America. In the event of an accident, I doubt that the province or OPG could reasonably implement emergency plans without people getting hurt. Here's an example.

Recently at the major intersections where I live at Victoria Park and Danforth Avenue there is construction and it usually takes about 20 minutes to get through that one light on a regular day to get to the 401. The other major routes near my area also have construction. Can you imagine what the roads would look like if under construction we had a nuclear accident?

As a schoolteacher I have seen the stress on parents and children when we have an early dismissal due to severe weather warnings. Parents are trying frantically to leave work from downtown to pick up their children at school before the storm arrives. Yet, they are stuck in traffic in the city centre. Can you imagine what would happen in the case of a nuclear accident as parents try to reach their children at school?

Families and schools are given guidelines on how to practise fire drills whether at home or school. Where are the plans for us to practise and keep our children safe in the case of a nuclear accident? To my knowledge, schools in Toronto have been given no instructions about how to care for the children in the case of a nuclear accident.

Schools near Pickering have potassium iodide pills, but my school does not. Toronto schools do not have KI pills stockpiled to administer it to our children and it may take their parents several hours to reach the school if the traffic is bad. Children are the most vulnerable to radiation and the sooner they receive their pills, the better chance they have.

Why have the province, OPG and CNSC

not met these most basic levels of citizen safety for a city the size of Toronto when these same safety measures have been put in place around the Bruce nuclear station? Why have I not received an information pamphlet like this one from my friend in South Bruce that is sent out annually from Bruce Power?

Pickering is closer to a large city than any other nuclear station in North America and therefore it represents too great a safety risk. When it was built 45 years ago, the surrounding population was much lower. I seriously doubt that the CNSC and province would allow new reactors to be built so close to Toronto today. It's reasonable to say that we would not build reactors here, so it is time for us to shut Pickering down.

I do not have confidence in the province to take these risks seriously. Instead of shutting Pickering down, they continue to encourage housing growth near Pickering, which just makes things worse in the event of an accident. I thus think it is up to the Commission to ensure our safety and not renew OPG's licence.

Though millions may be spent on upgrading the aging reactors, nothing will change the

fact that Pickering is the oldest nuclear reactor so close to a major city in North America. OPG is asking you to continue extending the station beyond its design life again and increase the risks further.

In contrast, New York State is closing the Indian Point nuclear station because of the station's age and proximity to New York City. The risk of operating a nuclear station so close to New York is no longer reasonable. I think the same logic applies to Pickering.

The people of Ontario do not use the majority of power generated from Pickering nuclear station, it is exported. No matter what you think of nuclear power, I think it is reasonable to say running Pickering to produce unneeded power is a totally unacceptable and unnecessary risk for the GTA. Our electricity bills are some of the highest rates in the country because of the costs of our aging nuclear reactors that are past their planned lifespan. Renewing the Pickering licence will continue to cause Ontario citizens exorbitant amounts of money for electricity, while living with the threat of a nuclear accident for power we export at a loss. This makes no sense. It also represents unreasonable risk both financially and to the health of Ontario citizens.

If in the future our provincial power needs should increase, we have a much cheaper and safer alternative source of hydropower available from Quebec. As things stand now we don't need Pickering's power, therefore the licence should not be renewed.

I do not work at Pickering, but I can understand being worried about my job. The station must be shut down given its age. The workers at the Pickering nuclear station have the most experience working there and they have families they need to support. If CNSC did not renew the licence, the money spent on nuclear energy could immediately be spent decommissioning the Pickering site using those same workers, rebuilding the Pickering waterfront after an environmental assessment and, finally, invest in training the former employees for renewable energy jobs.

In conclusion, based on the already overextended age of Pickering, its proximity to the large population in the GTA, its financial and safety burden to the citizens of Ontario, and the total lack of emergency preparations for our children and citizens in the GTA, I am asking the Commission to close Pickering for good and reemploy the workers in the immediate decommissioning of the station.

If you make the decision to renew Pickering's licence, I would like information for my family, my school and neighbours in the GTA on how to prepare for a nuclear accident. Thank you.

**THE PRESIDENT:** Thank you.

Questions?

**MEMBER PENNEY:** Thank you for that.

So I think many of your points we are going to hold to talk to the provincial OFMEM with respect to PNERP, and I don't know if you are able to come back to hear that conversation, but around your traffic congestion, emergency response plan, that sort of thing. But the question I would ask you is what kind of communications would you like to get from OPG? And then I'm going to ask OPG about their communications plan and how far out in terms of concentric circles it goes.

**MS BRUCE:** Well, I think certainly something like this pamphlet that Bruce Nuclear sends out annually, because it talks about the types of things you would do in your household. Even just basic things like turning off the air conditioner and things, people have no idea. And it also talks about how to administer the pills and so on. It's a regular reminder because people need that refresher. That's

the same reason why we practise at least six times a year the fire drill with the children, those kinds of things. There would probably also need to be training for the teachers, for daycare workers, because when there is a storm warning it takes parents a while. They are all trying to leave the downtown core at the same time and, as I think everyone in the room knows, that is not easy to do in rush hour.

**MEMBER PENNEY:** Thank you. OPG...?

**MR. LOCKWOOD:** Randy Lockwood, for the record. I would like to ask Scott Burns to speak to your question, but first I just want to say something.

I very much respect the intervener for coming here today. I read in the interventions she was both a mother and an elementary teacher, schoolteacher, two positions I very much respect so I don't want this to come across as we're the big giant corporation here with a very well-refined team, which we are. We do listen to each and every person and I would like that to be noted on the record, that I very much appreciate this intervener coming forward.

**MR. BURNS:** Scott Burns, for the record.

So just to confirm, the question is just generally around communication?

**MEMBER PENNEY:** Yes, your communication plan. Your communication plan. We will hear from OFMEM tomorrow or the next day.

**MR. BURNS:** Okay. So, yes, I can speak to OPG's communication plan, but I do need to state that it is done in partnership. It is actually written right into the Emergency Response Plan, so yes, the other partners have an important voice in this conversation. And the Nuclear Emergency Management Coordinating Committee, which all of the other reactor facilities sit on, as does the province, has subcommittees that specifically deal with communication.

The focus -- which I believe is sort of the foundation that the detailed planning zone is in line with industry standards. So the primary focus of the communication does go to the detailed planning zone, but there are efforts to extend beyond that. I know the Region of Durham is going to be here and they will speak to that as well. So in terms of their communication, which we do together, we support and financially we have invested millions of dollars in the last five years supporting our partners with these communications and being part of those communications. But they will speak -- they reach out beyond the

10-kilometre zone and out to the entire Region of Durham.

There seems to be a gap that we are hearing about in the City of Toronto beyond the 10K, it probably needs to be part of that further discussion and the City of Toronto could speak to that.

But what I will say is, as I mentioned earlier on this conversation, is there's a number of vehicles that OPG does use to reach our community. We have our Public Information Centre, we have our Community Councils, we send out our newsletters and we will continue to do that. We are very much interested in hearing about how we can improve reaching out to the community. I think what we are hearing is we may not be reaching everybody and that is important, as Mr. Lockwood has stressed time and time again around our commitment to safety, we need to continue to invest in that and assure the community is receiving those messages.

So, as I also mentioned earlier, in an effort to understand how effective our communications are, we do do polling and I recognize based on variables within polling we will hear about other results of polling throughout the week, but we do do

that to try to get a sense of how effective our communication programs are. But we look at the strategy annually and our emergency preparedness group works closely with our public affairs group and discuss the strategy, lessons learned from previous years, from polls, from all of these venues where our teams go out and talk to the community. We seize on those opportunities to inform next year's plan and the year after that.

So as Mr. Lockwood stated earlier, we are committed to continuing our communication strategies to ensure that members of the public understand what to do in an emergency, which again is an unlikely event, we acknowledge that, but it is important that they have that understanding that we are reaching as many people in the community as we can.

**THE PRESIDENT:** So just to be clear, tomorrow when the province is going to be here I would be interested in the plan for the 10 kilometres, the 20 kilometres and the 50 kilometres. I know that you are distributing within the 10, I remember you shared with us the pamphlet and all the stuff. I don't know what you do for the 20 and I don't know what you are doing for the 50. And together with the province I

want to understand what is a particular person within the 50, what kind of information they get and what kind of a website will deal -- because everybody keeps talking that they cannot find the information. Please don't answer now because I really think this should be delayed with the province here because I understand it's a joint venture here. So the local municipalities, you and the province together should have some way to reach all those zones and I would like to understand the difference.

So does anybody want to raise something else on this? No, this subject tomorrow. Any other subject that was raised? Go ahead.

**MEMBER LACROIX:** Yes, I do have a question. This is for OPG and also for staff. Is it possible to shut down a nuclear power plant, skip the shutdown period and dismantle the reactor right away? Is it feasible? Is it safe? Is it possible? Is it pragmatic?

**MR. MANLEY:** Robin Manley, for the record. Just to make sure I understand your question, you're asking is it feasible to shut down the reactor and immediately start to dismantle the actual reactor?

Okay, so I will try and briefly summarize

what would be involved in the process, and I'm looking for my team here to help me out if I get it a little bit wrong.

So we have experience with shutting down a reactor safely, units 2 and 3, and then going through a process of safe-stating those reactors whereby what we do is we defuel the reactor, which means we use the fueling machines to remove all the radiated fuel bundles from the channels, we put them in our irradiated fuel bays. That takes some number of -- let's call it months for lack of a more exact figure.

Then you go through a process of removing all of the heavy water from the heat transport and moderator systems.

And then what we did with those units is we went through a process of safe-stating the system. So certain electrical systems or other systems were taken out of service in a permanent way so that the reactors -- those two reactors cannot be restarted.

You have to maintain some other systems in service to sort of monitor the overall state. You can't turn off all the lights and all of everything; right?

So you could do that, but you would have to go through that process for all of the units; right. You'd have to defuel them all. You'd have to take all the heavy water out of all of them; put them all in various

kind of tanks. And then you would also have to begin the process of transferring the fuel from the irradiated fuel bays into dry storage containers. Because until the irradiated fuel bays have been completely emptied of fuel, because those irradiated fuel bays are in the plant, you could not actually dismantle everything until you'd finished that process, which would take, as has been mentioned earlier today, something on the order of 10-plus years to complete that before you could enter into a dismantling.

**MR. LOCKWOOD:** Randy Lockwood, for the record.

I would just like to add that we -- to answer the Commissioner -- we have considered could we do this better if we went at it right after we shut down. And as Robin outlined, there's some practicalities here that we have to deal with the fuel. And that's a finite amount of time, approximately 10 years that we just have to deal with.

As well, we need to consider other aspects that -- what our current plan -- based on our current understanding. And it will result in increased worker dose because we have not allowed the fields to decay. As well, that will also have impact on the public and the environment, because again, we start to dismantle this

before we've allowed it to decay. As well as we've looked at it will likely result in additional radioactive waste, which again has impact on the environment. So what we've concluded is the best thing to do, based on our current understanding, and that's what our preliminary decommissioning plan says, is to defer.

And I'll take you back, then, to what are we asking for: Commercial operations to 2024, a period to safely shut down and defuel the reactors, place them in safe storage, remove the heavy water. Then a period of allowing the components to decay plus letting the fuel, you know, decay heat, decay away in the fuel bays, place them in safe storage and then, at that time, approximately at that time, the DGR becomes available to dispose the fuel waste. And then move towards dismantle. Right?

So you add all those things together. It also has a big impact on cost. Right. Okay.

**THE PRESIDENT:** Okay. Any other questions?

Okay. Last word to you.

**MS BRUCE:** Thank you. And I feel that if the Province, OPG, and CNSC are really being responsible for the health of the people of Ontario, both safety and financially, as we are not using this power but exporting it at a loss, considering our children beyond a reasonable

risk, then Pickering licence cannot be renewed.

Thank you.

**THE PRESIDENT:** Thank you.

So I think this concludes the oral presentation for today. And I we got a little bit of time left, so we'll do some more written submissions.

**MR. LEBLANC:** This is correct. So we will resume where we left off before dinner. And the next submission ...

--- Off record discussion / Discussion officieuse

**CMD 18-H6.46**

**Written submission from E. S. Fox Limited**

**MR. LEBLANC:** So the next written submission is from E. S. Fox Limited, CMD 18-H6.46.

Any questions?

**CMD 18-H6.47**

**Written submission from Charles Chiarelli**

**MR. LEBLANC:** The next submission is a written submission from Charles Chiarelli, CMD 18-H6.47.

**THE PRESIDENT:** Are you okay? Okay, go.

**CMD 18-H6.48**

**Written submission from Karen Walters**

**MR. LEBLANC:** Next submission is from  
Karen Walters, CMD 18-H6.48.

**CMD 18-H6.49**

**Written submission from Aecon Group Inc.**

**MR. LEBLANC:** The next submission is from  
Aecon Group Inc., CMD 18-H6.49.

**CMD 18-H6.50**

**Written submission from Inès Marchese**

**MR. LEBLANC:** The next submission is from  
Inès Marchese, CMD 18-H6.50.

**CMD 18-H6.51**

**Written submission from Stephanie Beausoleil**

**MR. LEBLANC:** The next submission is from  
Stephanie Beausoleil, CMD 18-H6.51.

**CMD 18-H6.52**

**Written submission from Melis Kilic**

**MR. LEBLANC:** The next submission is from Melis Kilic, CMD 18-H6.52.

**MEMBER VELSHI:** I have a question, but I'd like Dr. Adams to be here from NRCAN to answer it. This is around seismic activity in the Pickering area. Is he going to be available on call sometime?

**MR. LEBLANC:** Yes, he'll be available later this week. Do we want to park this one?

**MEMBER VELSHI:** Okay, until then, please.

**MR. LEBLANC:** Thank you.

**CMD 18-H6.53**

**Written submission from Jill Lennox**

**MR. LEBLANC:** The next submission is from Jill Lennox, CMD 18-H6.53.

**CMD 18-H6.54**

**Written submission from Jayanthini Jegatheswaran**

**MR. LEBLANC:** The next submission is from Jayanthini Jegatheswaran, CMD 18-H6.54.

**CMD 18-H6.61**

**Written submission from Linda Gasser**

**MR. LEBLANC:** The next submission is -- oh, I don't know if the Members will be able to find it, if it's not in numerical order. It's from Linda Gasser, who was a written -- an oral intervention, and she's informed us she wanted her submission to be treated verbally -- I mean, in writing. And it's CMD 18-H6.61.

**THE PRESIDENT:** And, again, many of the topics are associated with the Office of the Fire Marshal. So we'll discuss it tomorrow.

**MR. LEBLANC:** Do any of the Members have questions on this one? No? Okay.

**CMD 18-H6.80**

**Written submission from the City of Pickering**

**MR. LEBLANC:** The next submission is from the City of Pickering, CMD 18-H6.80.

**CMD 18-H6.81**

**Written submission from Lucy Seidler**

**MR. LEBLANC:** The next submission is from Lucy Seidler, CMD 18-H6.81.

Dr. Demeter.

**MEMBER DEMETER:** I think -- I'm not sure if it will be coming up later with any intervention. If it is, I can park it as well. But this issue of raising issues of liability to homeowners. I think that's in this invention. This is 81?

I think it's probably reasonable for CNSC to clarify our scope relative to liability to third parties such as homeowners and who sort of has jurisdiction on that issue.

**MR. FRAPPIER:** Gerry Frappier, for the record.

There's new legislations that's been brought in a little while back with respect to increasing the Liability Act with respect to the amount of liability that's on licensees.

There's also policies with respect to how the liability is going to be used if you like, sort of thing, but it's not a CNSC responsibility, it's an NRCAN responsibility, so with respect to liability and how that's

going to be dispositioned, that would be NRCAN that would have that responsibility, not ourselves, but I can ask somebody in Ottawa for a bit more, if you want, on that.

**MEMBER DEMETER:** That's good. I just wanted to clarify who had the lead on that.

Thank you.

**MR. LEBLANC:** If it's important to the members to have a fulsome response from NRCAN, they're on standby and could answer probably tomorrow, so if you want to park this question, I will make a contact with them and make sure that Mr. Jacques Hénault from NRCAN is available.

**CMD 18-H6.82**

**Written Submission from the  
Toronto Environmental Alliance**

**MR. LEBLANC:** The next submission is from the Toronto Environmental Alliance, CMD 18-H6.82.

**THE PRESIDENT:** I think I'm going to ask this question anyhow.

I know we're going to discuss tritium, but this intervention says, and I'm quoting here, I think it's the second page, the third paragraph:

"...continued concern over the excess levels of tritium and other

radionuclides found in Toronto's  
waterways and Lake Ontario..."

Is that true?

**MR. FRAPPIER:** Gerry Frappier, for the  
record.

I'd ask Mike Rinker to respond to that.

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

There is information available for someone  
to get an understanding of what are the tritium levels in  
water supply plants across the province. Labour Ontario,  
for example, publishes reports on their surveillance  
programs on their website.

As well, we do our own independent  
environmental monitoring program. Ontario Power  
Generation, in their annual compliance reports, which are  
published online, show the data for tritium in water supply  
plants. In general, the values range in the area of  
Pickering between four to eight becquerels per litre, so  
they're quite low. Even in the event of upset conditions,  
we haven't seen tritium at water supply plants rise more  
than 15 to 20 becquerels per litre.

In general, the state of the Great Lakes  
has shown peak tritium concentrations in the mid-1960s as a  
result of in-air nuclear bomb testing. Tritium values were  
monitored in the Great Lakes Basin, in all of the Great

Lakes, including Lake Superior, by the Canada Centre for Inland Waters, a division of Environment Canada, and they stopped monitoring in the nineties, because over the course of the sixties, seventies, eighties, and nineties the concentrations have been decreasing, despite the fact that the nuclear powerplants were constructed and operated during that time, so we do see tritium values lake and watershed-wide decreasing over time despite the operation.

**THE PRESIDENT:** Thank you.

**CMD 18-H6.83**

**Written Submission from Borden Rhodes**

**MR. LEBLANC:** The next submission is from Borden Rhodes, CMD 18-H6.83.

**THE PRESIDENT:** Mr. Berube.

**MEMBER BERUBE:** This intervener brings up an interesting point. He talks to the instability of currencies and basically economies. Of course, that impacts the potential for decommissioning and actually the security deposits that we have against that, and of course hyperinflation would really impact that. Could you quickly discuss how you protect yourself against a situation where we have a short period of hyperinflation, and what does that really do to this particular security?

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

I'm presuming that you're talking with respect to the financial guarantee and the decommissioning and waste funds. OPG, along with the Province of Ontario, made a presentation to the Commission last fall with respect to our decommissioning funds and the financial guarantee. Those funds are currently in a position where we have an excess, there's extra money in the fund versus the projected requirement.

I do understand your point that currencies can fluctuate and funds can go into a shortfall versus an overage. If that were to happen, we have an agreement with the Province of Ontario that they would make up a guarantee for that difference. Such a process has been exercised in the past, and since then the funds have recovered and they're in an excess position, as I say, right now. That was presented to the Commission last year and was accepted by the Commission, and the three parties have all signed off on it.

Right now, I would say that our experience is that those funds are very well-managed, and the evidence that we presented last year was quite strong in that regard.

**MEMBER BERUBE:** Obviously, I wasn't here last year, but thank you for bringing me up to speed on

that.

**MR. FRAPPIER:** Gerry Frappier, for the record.

I'll ask Karine Glenn if she wants to add anything to those financial guarantee discussions.

I think Mr. Jammal wants to add something.

**THE PRESIDENT:** We see you, Ms Glenn, but we can't hear you.

**MS GLENN:** Karine Glenn, for the record. Can you hear me now?

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

**MS GLENN:** The only thing I would add is that the financial guarantee is required to be revised every five years, and to come back before the Commission on a five-year basis.

In addition, OPG is required to report to CNSC staff on the value of their fund on an annual basis, and we verify that the value of their fund exceeds the amount of costs that are associated with the decommissioning on an annual basis.

As Mr. Manley pointed out, the fund value is currently at \$21.2 billion, and the decommissioning liability is, for 2018, \$16.5 billion, so they do have a sizeable excess at this point in time. Nonetheless, we verify that on an annual basis and should that value fall

below what their decommissioning liabilities are, we would require the licensee to make up that shortfall.

We report annually on the validity of OPG's financial guarantee through the regulatory oversight report.

**THE PRESIDENT:** Thank you.

Go ahead.

**CMD 18-H6.84**

**Written Submission from Lori Moncada**

**MR. LEBLANC:** The next submission is from Lori Moncada, CMD 18-H6.84.

**THE PRESIDENT:** Ms Velshi.

**MEMBER VELSHI:** A question for CNSC staff. The intervener, at the end of page 1, talks about an increased, or anecdotally anyway, incidence of thyroid cancer within the 10-kilometre zone, and the reference to the RADICON study, which looks at 25 kilometres. Can you comment on the 10 kilometres? Is there additional information available about that, and is this real?

**MR. FRAPPIER:** Gerry Frappier, for the record.

I would ask Mr. Mike Rinker to comment on

that.

Also, we do have with us an international specialist on the subject. Perhaps she could be introduced and say a few words as well.

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

This particular question, Dr. Rachel Lane will provide the answer.

But I do want to acknowledge that we have -- throughout the hearings, questions on health will come up. We have Dr. Lydia Zablotska, who is with us. She is a medical doctor with a PhD in epidemiology, a professor in the Department of Epidemiology and Biostatistics in the School of Medicine at the University of California. She has supported us on many such studies, and her own speciality is thyroid cancer in children around Chernobyl, and leukemia and other cancers in the cleanup workers at Chernobyl. She has helped us as a peer reviewer for what's called the SARP study, the Study of Consequences of Hypothetical Severe Nuclear Accidents, and a reanalysis of Canadian nuclear energy workers with a focus on tritium exposures, in particular.

For now, I'll ask Dr. Rachel Lane to answer the question.

**DR. LANE:** Dr. Rachel Lane, for the record. I'm the CNSC's epidemiologist.

First of all, with respect to thyroid cancer in the Pickering area, that is correct, thyroid cancer has increased around the Pickering area, and also around the GTA area. Now, in Ontario, the greatest increases in instance rates from 1983 to 2013 occurred in thyroid cancer. The rapid increase in incidents of thyroid cancer is occurring worldwide, and seems to be due to improved detection technology, not because of radiation. I spoke to the epidemiologist from Durham Region and she confirmed this trend within Pickering and the GTA, which is consistent with worldwide, and likely due to improved detection of thyroid cancers.

With respect to the RADICON study, you are correct. We looked at the 25-kilometre radius of three nuclear facilities at Bruce Pickering and Darlington and cancer incidents around those communities. The most important finding was that, for children 0-4 and 0-14, there was no increase in leukemia.

When we looked at the rates, we chose the 25-kilometre radius for several reasons. One, because previous studies around the nuclear facilities in Ontario were also 25 kilometres, but also because we were including Bruce within that and the population density just wasn't there to look at a smaller radius, so we chose 25 kilometres.

But for children and childhood leukemia, obviously that's the most important outcome that we'd be concerned with.

We were able to look for at the 10-kilometre radius and we found no increased risk of childhood leukemia at the 10 kilometre. We weren't able to look at the five-kilometre radius just because there wasn't the population density to be able to find sufficient number of -- there were too few cases to be able to look at this. And this was, you have to remember, over an extended period of time from 1990 to 2008. So, we had many years to look at cancer incidence among those children.

**MEMBER VELSHI:** And did you look at the incidence of thyroid cancer within 10 kilometres?

**DR. LANE:** I'd have to go back and look at the tables. I can't confirm that right now.

**THE PRESIDENT:** But just the bottom line. Is there any evidence or any study that shows that it is dangerous to live beside a nuclear power plant?

**DR. LANE:** Rachel Lane, for the record. Yes, there is lots of evidence to indicate that there are no adverse effects associated with living near a nuclear power plant as a result of

normal operations.

This has been looked at by the United Nations Scientific Committee on the Effects of Atomic Radiation and various other large committees that have looked at the health effects of people living in the vicinity of nuclear facilities.

This is because environmental exposures from nuclear facilities during routine operations are exceedingly low, well below the public dose limit of 1 mSv per annum.

**THE PRESIDENT:** Do you want to add anything to this?

**MS ZABLOTSKA:** Lydia Zablotska, for the record. Dr. Lane, I completely support what she said. The literature, the published studies, the epidemiological studies that were done around the world do not support any increased risk of leukemia in children.

There was only one study that has been referenced by some intervenors, the KiKK Study, but we looked -- myself and other people looked into the data for this study and it appears to be one cluster within the 1970s-80s that drove this increased risk and it was explained that it's not due to radiation. So, that is the only study ever that showed some increased

risk and it's a cluster effect.

In terms of thyroid cancer that Dr. Lane was talking about, it's -- I want to explain that the increased rates of thyroid cancer incidence in the world are due to man-made effect where people are asking for more screening and they find small cancers which many people live and they never come up and they are never identified, they never pose any risk.

And this was, in fact, in Chernobyl, particularly in Belarus where these campaigns have been done where every child was screened and a lot of cancers were found and a lot of surgeries were done which were unnecessary, and this was reported in many international reports, in particular, in UNSCEAR which showed that these screening campaigns, this is what's driving this increased thyroid cancer incidence.

I was just recently in Korea where they had this very increasing rate of thyroid cancer and then the government intervened and stopped the screening campaigns and we see that in the last five years the rates in Korea, in South Korea went down of thyroid cancer because of the stop of screening and there was -- it's not related in any way to radiation exposures.

**THE PRESIDENT:** We're going to discuss

this further throughout those days coming forth, but maybe you should think about, so what's a conclusion on Fukushima now which they have also enormous screening for thyroid.

**MS ZABLOTSKA:** Yes.

**THE PRESIDENT:** Or is it the same pattern?

**MS ZABLOTSKA:** It's the same pattern and the recent UNSCEAR Report particularly references the point that you're mentioning, is that this unnecessary annual screening is picking up cancers that are smaller than five millimetres that have no clinical significance.

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

Dr. Demeter?

**MEMBER DEMETER:** Thank you. I'll just ask one more question on the thyroid cancer, and I truly understand and believe in the over diagnosis; if you look too hard you'll find things that might not mean anything, but then you pick them up.

But in the Radicon Study it looked at, holding all things equal as I understand it, thyroid cancer rates within 25 kilometres of three different nuclear power plants: Bruce, Pickering and Darlington, and it found different results for different power

plants. So, those are the same measurements during the same time period with probably the same screening patterns.

So, I guess one of the questions would be, how do you reconcile that it was elevated with a 95 per cent confidence involved for Pickering but not for Bruce and Darlington given that it was holding all things as equal as possible? That's the reconciliation that would be an interesting hypothesis how Pickering became different than Bruce and Darlington with regards to thyroid cancer.

Maybe CNSC staff.

**DR. LANE:** Rachel Lane, for the record. First of all, I'll have to go back and look specifically at the three different regions.

I'd like to clarify one thing, is that the levels of iodine emissions from the plants were minimal throughout the time period that we looked at. Also, we did not look -- sorry, also, the thyroid cancer was in adults not in -- in Chernobyl the concern was thyroid cancer among children who were exposed as children to iodine, radioactive iodine who developed thyroid cancer later on in life.

This is not the situation here. We've got exceedingly low doses of radioactive -- we don't -- we have

no doses of radioactive -- we have minimal levels of radioactive doses of iodine in the Canadian nuclear power plants.

**THE PRESIDENT:** Okay. I think we should defer this. I think tomorrow we have -- I think it's tomorrow.

**MR. LEBLANC:** First intervention.

**THE PRESIDENT:** First intervention tomorrow will re-visit the subject. Maybe look at your data again.

Any other questions here on that? Go ahead.

**CMD 18-H6.85**

**Written submission from William Douglas**

**MR. LEBLANC:** The next submission is from William Douglas, CMD 18-H6.85.

**CMD 18-H6.86**

**Written submission from Maryam Astaneh**

**MR. LEBLANC:** The next submission is from Maryam Astaneh, CMD 18-H6.86.

**CMD 18-H6.87**

**Written submission from Christopher Small**

**MR. LEBLANC:** The next submission is from Christopher Small, CMD 18-H6.87.

**CMD 18-H6.88**

**Written submission from the  
Canadian Council for Aboriginal Business**

**MR. LEBLANC:** The next submission is from the Canadian Council for Aboriginal Business, CMD 18-H6.88.

**CMD 18-H6.89**

**Written submission from ATS Automation**

**MR. LEBLANC:** The next submission is from ATS Automation, CMD 18-H6.89.

**CMD 18-H6.90**

**Written submission from Sylvia Schmidt**

**MR. LEBLANC:** The next submission is from Sylvia Schmidt, CMD 18-H6.90.

**CMD 18-H6.91**

**Written submission from Scientists in School**

**MR. LEBLANC:** The next submission is from Scientists in School, CMD 18-H6.91.

**CMD 18-H6.92**

**Written submission from the City of Toronto**

**MR. LEBLANC:** The next submission is from the City of Toronto, CMD 18-H6.92.

Ms Velshi?

**MEMBER VELSHI:** So, I know we're going to save discussion until the province is here tomorrow, but a question for staff and OPG.

Were you at the City of Toronto's meeting or wherever they made this resolution? Were either of you invited to make a submission?

**MR. FRAPPIER:** Gerry Frappier. From CNSC's perspective, no, we were not there and we were not invited to be there.

**MR. BURNS:** And Scott Burns, for the record. We were not invited either.

**CMD 18-H6.93**

**Written submission from Maria-Theresia Roemmelt**

**MR. LEBLANC:** The next submission is from Maria-Theresia Roemmelt, CMD 18-H6.93.

**CMD 18-H6.94**

**Written submission from Ralf Wieser**

**MR. LEBLANC:** The next submission is from Ralf Wieser, CMD 18-H6.94.

**CMD 18-H6.95**

**Written submission from Jeff Brackett**

**MR. LEBLANC:** The next submission is from Jeff Brackett, CMD 18-H6.95.

**CMD 18-H6.96**

**Written submission from  
Rolls-Royce Silver Nuclear Canada**

**MR. LEBLANC:** The next submission is from Rolls-Royce Silver Nuclear Canada, CMD 18-H6.96.

**CMD 18-H6.97**

**Written submission from Lois M. Banks**

**MR. LEBLANC:** The next submission is from Lois M. Banks, CMD 18-H6.97.

**CMD 18-H6.98**

**Written submission from  
Bruce Peninsula Environment Group**

**MR. LEBLANC:** The next submission is from the Bruce Peninsula Environment Group, CMD 18-H6.98.  
Dr. Demeter...?

**MEMBER DEMETER:** Just to make sure I've got my numbering right, I'll pull up the document.

It talks of the difference between the Pickering design and other subsequent designs relative to emergency shutdown procedures, and I'll make sure I've got the right -- having one shutdown system versus two. And I didn't really understand what that meant.

I think it was this intervenor. Yeah, it is.

So help me understand design sequence

and whether or not there is a significant difference in the defence in-depth with regard to a number of shutdown systems in redundancy between Pickering and other CANDU reactors.

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

Units 1 and 4 on the Pickering site have two different ways to quickly shutdown their reactor. One is with shut off rods dropping into the core and the other with the moderator dump system. These are two different ways that the reactor can be shutdown.

During the time when return to service was happening on Pickering 1 to 4 side which was in the early nineties, the requirement for independent shutdown systems was reviewed during the return to service, and that included CNSC staff and the Commission. The review was specifically done against codes and standards, understanding there were differences between the five to eight units with a liquid injection system, a different way to shut down. The intent was to see if there was any improvements that could be made.

Alternative approach called "shutdown system enhancement" or SDSE, was the adopted approach

at the Pickering 1 to 4 units. That involved devising, designing, and installing an independent set of trip parameters, independent of the shutdown system alpha and shut off rods and moderator dump system that monitored conditions. It also included adding additional shut off rods to the existing shut off rods so that, in the end with that enhancement, the SDS regulations, though previously met, were enhanced or the requirements were enhanced -- shutdown system requirements were enhanced.

Really, in the end, two different diverse means are available on the 1 to 4 units to shut down the reactor. It's not credible that any event would preclude, you know, not shutting down a reactor with a shutdown system.

**MEMBER DEMETER:** Maybe staff can help me out here. Relative to the fleet of CANDU reactors and shutdown systems, is there anything peculiar about Pickering as the intervenor suggests, relative to safety?

**MR. FRAPPIER:** Gerry Frappier, for the record.

The short answer would be yes, Pickering A as opposed to Pickering B. The other CANDU reactors, as was just mentioned, was designed

from the beginning with the two diverse independent shutdown systems. Pickering A did have a little bit of a different design that has been enhanced since that time, as was just mentioned by OPG. So it has some different mechanisms by which it can be shutdown including moderator dump, and an enhancement to the shutdown system associated with shut off rods.

But for more detail I would ask Mr. Vali Tavasoli, who is back in Ottawa, if he could give us a few more details.

**MR. TAVASOLI:** For most CANDU reactors design at the Pickering A, two fast-acting, independent and effective shutdown systems were required by AECSB at the time because of the feature in the design of the CANDU reactors which is called positive void reactivity. By having two fast acting independent systems, it would render a possibility of having a runaway power transient extremely unlikely.

In the case of Pickering A, as the gentleman from OPG mentioned, there are two means for shutting down the reactor, the SDSE, which was an enhancement to the original shutdown system, was enhancements. It increases effectiveness and reliability of the original shutdown system.

The moderator dump system, which is

one other fast means to reduce reactor power by basically opening valves and rapidly reducing the liquid level in the moderator, in the calandria, is good for more probable, slower transients -- accidents like lots of low small LOCA.

For faster transients it is too slow, but its ineffectiveness is taken into account in the PSA studies, and I will ask my colleagues in PSA -- I don't know if Smain Yalaoui is there. He can take that into account.

**MR. JAMMAL:** It's Ramzi Jammal, for the record.

I think we got into too deep into technology. The question is it safe and is it equivalent to an existing CANDU. Historically, they were not allowed to do restart under the AECB, Atomic Energy Control Board, until the staff assessed the establishment of the requirement which puts us today in the same equivalency as any other CANDU with respect to the shutdown and maintaining the shutdown of the reactor.

So what you heard from the colleagues is the technical assessment that was put in place, but the key point from a safety perspective and from a Commission decision, our recommendation to you is the

equivalency exists today at Pickering as it does for the new CANDUs that were put in place.

The key point here: Is it going to shutdown safely? The answer is yes. Is it going to be controlled in a safe shutdown state? The answer is yes.

In addition to the shutdown system itself, again I've got to go back to the fact that post-Fukushima, all the enhancements that was taken in play -- that was put and the measures taken guarantees the safety of the reactors. So in conclusion, is it the equivalent to the existing CANDUs after the Pickering? The answer is yes.

**MEMBER DEMETER:** Okay, thank you very much.

**THE PRESIDENT:** Go ahead.

**MEMBER PENNEY:** I have a question on the same page, and it's for the CNSC staff, quoting the Commissioner for the Environment and Sustainable Development, Julie Gelfand's scathing report with respect to CNSC. I think it says it doesn't follow its own inspection procedures. Perhaps you can give us some detail on that, and if there has been any follow up.

**MR. FRAPPIER:** Gerry Frappier. for the

record.

Yes, I know it well. So the Auditor General or the Office of the Auditor General, the actual Commissioner of Sustainability, did undertake an audit of the CNSC and, in particular, the inspection program or compliance program that we have for nuclear power plants.

One of the key findings of that audit was that the CNSC inspection teams were often doing inspections using draft inspection guides as opposed to the requirement that we had which said that we had to use approved inspection guides. So that's what has been referred to as being in non-compliance to our own procedures.

We did do quite a bit of investigation both into that and it was a systematic bias that we had, in the sense that we also have a requirement for learning at the end of each inspection, and so the idea being that every time you do an inspection you're learning something and therefore you should improve the procedure.

And so what that had with time evolved into was, in fact, the inspection guides never really got approved. They just kept getting improved -- never got approved. They just kept improving, if you

like. So that's still not acceptable.

And so we took a very strong stance and changed the ruling so there would always be an approved inspection guide that was being used. We still have the learning process but it's in a much more controlled way, so that at any given time an inspection is done with an inspection guide that has been approved by the appropriate people.

**THE PRESIDENT:** Question? Ms Velshi...?

**MEMBER VELSHI:** I'll start off with OPG. At the end of page 2, there is some question around security measures along the lakefront and that American nuclear reactors on the Great Lakes have security zones enforced along the lakefront and Pickering doesn't.

Can you comment on that, and then maybe staff can follow?

**MR. BURNS:** Scott Burns, for the record.

In terms of security of the Pickering site, we have a comprehensive physical protection system including fence and the associated detection systems on that fence on the water side. That fence is equipped with certain detection systems. We have

all of our delay systems in place to adequately protect OPG assets at Pickering.

**MEMBER VELSHI:** So the statement here that kind of implies that there is a higher level of security control in the American plants; is that correct?

**MR. BURNS:** Scott Burns, for the record.

I may -- CNSC may wish to speak to this question as well but, from my perspective, we continually speak to U.S. facilities and benchmark at their sites and, based on my knowledge of security systems in the U.S., as compared to Canada, our systems are as good as the U.S. plants, as secure.

**MR. FRAPPIER:** Gerry Frappier, for the record.

Certainly, we have a lot of exchanges with the U.S. NRC on security. We have quite a program of us going down there, visiting them with respect to their security, both armed response, waterborne, and within the site. We've had them up here many, many times. While there might be some differences, I don't think anybody would suggest that the Americans are better than us or that we're better than the Americans. We do have a significant security

perimeter facing the water and so do the Americans.

I think Kathleen Heppel-Maysys is here as well and she may want to add a little bit to that.

**MS HEPPEL-MAYSYS:** So recently in 2015, the CNSC hosted a peer review in the physical protection and so from the IAEA -- a mission that we hosted from the IAEA and they looked at the entire system of physical protection, and we were one of the countries that received the most -- I'm forgetting the term -- good practices, thank you -- and only a few suggestions to address. So certainly in terms of benchmarking, we are doing quite well.

And as well, the licensees are subject to regular force-on-force exercises as well to test their capability and they do a self-assessment on that and our staff monitors their performance as well. So we're confident in the physical protection practices executed at the licensees.

**MR. FRAPPIER:** Gerry Frappier, for the record.

I now understand that Mike Beaudette or one of his officers is available in Ottawa. The question was specifically, I think, around water security and whether the U.S. does it much better than us or different, I guess.

**MR. POIRIER:** This is Yves Poirier, team leader for high security nuclear facilities at the nuclear security division.

The barriers are in place to prevent access to the facility from the water and security measures are in place to deal with such a scenario. However, that information is protected.

With regards to international benchmarking, CNSC staff do take part in many, many updates and reviews of international documents, in particular the nuclear security series that is published by the IAEA.

**MR. LOCKWOOD:** Randy Lockwood, for the record.

President Binder, this may be a good time to introduce an additional piece of information around cyber security. You recall prior to our dinner, we were talking about cyber security. We have since discussed that and we would like to add a slight correction to our response, for the record.

I'll ask Mike Benjamin to speak to this, if you would permit.

**THE PRESIDENT:** Go ahead, please.

**MR. BENJAMIN:** Mike Benjamin, Senior Manager, Cyber Security, for the record,

So OPG manages its cyber assets in a secure, vigilant and resilient manner. Since 2010, we have had robust controls in place protecting and minimizing risk to those critical cyber assets that support nuclear safety functions.

This was confirmed earlier this year when we had a Type 2 inspection from the CNSC at the Pickering site. We have been working through the CANDU Owners Group with the other utilities, including Bruce Power and New Brunswick Power, on how to meet the new CSA N290.7 standard. That is going to -- we have a project in place at OPG to put that into effect at Pickering by the end of next year.

So the CSA N290.7 new security standard will be in place at Pickering at the end of 2019.

**MEMBER PENNEY:** I had a security question. The intervenor refers to a no-fly zone. Is there a need for a no-fly zone? Do you have a no-fly zone?

**MR. FRAPPIER:** Gerry Frappier, for the record.

Again, I'd go to Ottawa and ask Yves if he wants to provide comments on that.

**MR. POIRIER:** This is Yves Poirier

from the nuclear security division, for the record.

Pilots are reminded that overflights of nuclear power plants shall be carried out in accordance with the provisions of the Canadian Traffic Control Regulations. They are not controlled by the CNSC. They are regulations but no such thing as a no fly for this particular power plant.

**THE PRESIDENT:** We are getting very close to prescribed information here, so that's as far as we'll take it.

Any other questions?

Okay, Marc, one more?

**CMD 18-H6.99**

**Written submission from Nicole Bafaro**

**MR. LEBLANC:** One last intervention for tonight. It is a written submission from Nicole Bafaro, CMD 18-H6.99.

So this concludes today's proceeding. We will continue tomorrow morning at 8:30. If you have borrowed any interpretation devices, please return them so you can get back your I.D. cards. Thank you.

Tomorrow, we will do some more oral interventions, and written submissions, time allowing.

Thank you very much. Good night.

--- Whereupon the hearing adjourned at 8:42 p.m., to resume  
on Tuesday, June 26, 2018 at 8:30 a.m. /

L'audience est ajournée à 20 h 42 pour reprendre  
le mercredi 26 juin 2018 à 8 h 30