

**Canadian Nuclear
Safety Commission**

**Commission canadienne de
sûreté nucléaire**

Public hearing

Audience publique

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

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

Commission Members present

Commissaires présents

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

**M. Michael Binder
M^{me} Rumina Velshi
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Secretary:

Secrétaire:

Mr. Marc Leblanc

M. Marc Leblanc

General Counsel:

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

To my right are Dr. Sandor Demeter and Ms Kathy Penney.

To my left are Dr. Marcel Lacroix, Mr. Timothy Berube and Ms Rumina Velshi.

We already heard from our Secretary, Marc Leblanc, and we also have with us here today Ms Lisa Thiele, Senior General Counsel to the Commission.

CMD 18-H5

Adoption of Agenda

THE PRESIDENT: I would like to start by calling for the adoption of the agenda as outlined in Commission Member Document 18-H5.

For the record, the agenda is adopted.

MR. LEBLANC: This is Part 1 of the public hearing. The initial Notice of Public Hearing and Participant Funding was published on September 29th, 2017.

A revised notice was posted on March 16th, 2018, to announce the location for Part 2 of the hearing.

Submissions from OPG and CNSC staff were filed on March 5th. They were made available on the CNSC website shortly after that date.

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

March 28th was the deadline for filing of supplementary information. We note that presentations have been filed by OPG and CNSC staff.

Part 2 of the public hearing is scheduled for June 26th, 27th and 28th, 2018, and will be held at the Hope Fellowship Church in Courtice, Ontario.

The public is invited to participate either by oral presentation or written submission at the Part 2 hearing. The deadline for the public to file a request to participate and a written submission is May 7th, 2018.

In terms of location in Courtice, just rest assured that we looked for a hotel or facility closer to the Pickering site and all over Toronto for that time period and nothing was available despite our using the assistance of the Tourism Bureau and other like organizations. We were well served in Courtice in the past, so we are pleased to go back there.

To assist the new Commission Members, I will ask the presenters and those answering questions to

please avoid using acronyms.

Mr. President...?

THE PRESIDENT: That's going to be tough.

So before we start I would like to share with you that we have representatives from Health Canada, Environment and Climate Change Canada, and the Office of the Fire Marshal and Emergency Management here with us.

Also joining us by teleconference are representatives from Fisheries and Oceans Canada.

Fisheries and Oceans, can you hear us?

MS THOMAS: Yes, we can. Thank you.

THE PRESIDENT: Thank you.

So I would like to start the hearing by calling on the presentation from Ontario Power Generation as outlined in Commission Member Document 18-H6.1 and 18-H6.1A.

I understand that Mr. Jager, you will make the presentation. Over to you. I guess not.

CMD 18-H6.1/18-H6.1A

Oral presentation by

Ontario Power Generation Inc.

MR. LOCKWOOD: For the record, my name is Randy Lockwood. Good morning, President Binder and Members

of the Commission.

I am the Senior Vice President, Pickering Nuclear at Ontario Power Generation and I am responsible for the safe and reliable operations of the Pickering Nuclear Generating Station. My career in the nuclear industry began in Douglas Point 40 years ago. Since then I worked at five CANDU stations across three continents in various roles of increasing responsibility.

Alongside me today, on my right, is Steve Gregoris, Deputy Site Vice President, Pickering; as well, on my left, Stephanie Smith, the Director of Operations and Maintenance, Pickering.

We are also pleased to be joined by our Nuclear President and Chief Nuclear Officer, Glenn Jager; and last but not least, other members of the OPG team seated behind me.

On behalf of the entire OPG team, it is our pleasure to be in attendance this morning.

We are here in support of our request for the renewal of the Pickering Power Reactor Operating Licence which expires August 31st, 2018. We have requested a renewed licence term of 10 years.

In a moment I will ask Glenn Jager to provide opening remarks, including a brief overview of Ontario Power Generation and how the Pickering licence

renewal plays a key role in our company's social licence.

I will then speak briefly about our specific request of the Commission and the fundamental commitments included in our licence application. I will also spend a little time to tell you how proud I am of Pickering's performance. The OPG team has achieved some of the best performance in the station's long history.

Steve, Stephanie and I will then expand on our commitments in the context of Pickering extended commercial operation.

I will touch briefly on the transition from the end of commercial operation to the start of the safe storage.

We also have a few short videos that will form part of today's presentation.

In addition, we plan to do a little show-and-tell with the emergency awareness kits. These emergency awareness kits are the very same packages that were supplied to people living near the Pickering site.

We hope you find our presentation to be informative and useful.

I will now pass the presentation over to Glenn Jager.

MR. JAGER: Good morning, President Binder and Members of the Commission. For the record, my name is

Glenn Jager and I am the President of Nuclear and Chief Nuclear Officer for Ontario Power Generation. I am accountable for all the nuclear operations within OPG.

OPG operates a fleet of nuclear units which includes Pickering, Darlington and three waste sites. We also own the Bruce site which is operated by Bruce Power. And we operate two combined cycle gas plants, two stations fuelled by biomass, 66 hydroelectric stations, and 264 control dams that control the water level throughout the Province of Ontario, including the Great Lakes. Three of our hydroelectric stations were developed in direct partnership with Indigenous communities located near those facilities. Together our facilities provide more than half of Ontario's energy needs and communities as far north as James Bay right down to Pickering.

We understand what it means and takes to operate in partnership with local and Indigenous communities, remote communities and we understand the obligations to operate safely and responsibly at all of our sites throughout Ontario. We understand the leadership and the example we set and the need to earn the trust of local communities each and every day. This is our social licence.

Pickering Nuclear is supported by OPG's full technical capability, financial resources and more

than 9,000 people throughout Ontario. OPG utilizes fleet standards and capability to ensure that Darlington, Pickering and Western Waste operate environmentally and to the highest standards of safety and reliability.

OPG is also part of a larger industry fleet. Through membership in the World Association of Nuclear Operators (or WANO), INPO, which is the Institute of Nuclear Power Operators, EPRI, which is the Electric Power Research Institute, CANDU Owners Group, which we refer to as COG, and others, we obtain standards of excellence, share operating experience and technical innovation. We receive training and assistance. We benchmark good practices and are subjected to critical peer evaluations of our performance. We support Canada's membership in the IAEA as part of various consultations and groups and are subject to oversight by both the IAEA and the CNSC. This network of support and oversight has resulted in both Pickering and Darlington achieving high levels of safety and reliability.

For example, last year Pickering operated three quarters of the year without an employee injury, so without a lost time accident certainly, but without injuring a single employee. This is quite remarkable performance. It is excellent performance that is really unheard of in the industry for a site that has six units

and almost 3,000 people on site. The proof of the effectiveness of this industry and corporate support is in our excellent performance, performance that Mr. Lockwood and his team will speak to today.

Pickering's greenhouse gas-free energy has contributed to the health and welfare of all Ontarians by providing clean energy, employment and supplying isotopes worldwide. As a result of OPG's 99 percent greenhouse gas-free energy from our nuclear and hydroelectric facilities, Ontario is the lowest greenhouse gas-emitting jurisdiction in the world. The safe work environment, clean energy, medical isotopes produced by Pickering are saving the lives of Canadians every day.

You know, I walked into Pickering on my first day at work 37 years ago and I was met with a very large plaque. A lot of the buildings around have changed since then, but the plaque is still there and I want to read to you in part what it says:

"Dedicated to serve the people of Ontario, this nuclear power plant is a testimony to the spirit of adventure and ingenuity of Ontario Hydro, Atomic Energy of Canada Limited and the Manufacturers and to the skills of thousands of workers."

(As read)

Names of the companies have changed, but I am proud to say that as Chief Nuclear Officer that statement is as true today as it was 46 years ago when that plaque was dedicated.

I will turn the presentation back over to Mr. Lockwood.

MR. LOCKWOOD: Thank you, Glenn.

Randy Lockwood, for the record.

Commissioners, looking back at the start of my career and thinking about the early stages of Pickering, I recall the great sense of pride that existed at the plant and throughout the CANDU industry. Pickering was a major milestone in the Canadian development and implementation of the CANDU technology. I joined the Pickering team only a few years ago and I can tell you that this sense of pride has not wavered. In fact, it is growing.

As a team we are very proud that Pickering is heading into the next licence period with some of the best performance ever. This is a testament to the dedication and diligence of the employees and personnel who have been supporting the station's operation each and every day. I have had the privilege of working with many exceptional people throughout the nuclear industry in

several places around the world. The Pickering team is by far the best team I have ever worked with. They are the best team in the industry.

And while people have come and gone over the years, the plant too has changed. It's not the same as before, when it first began, it is better. It's far better. We have been investing in the plant all along and these investments have made the Pickering plant safer than ever before and more reliable. Our programs are solid. Our staff are highly trained and competent. For these reasons we are very confident that the plant can be safely operated and maintained, fit for service through to the end of commercial operations in 2024.

OPG will continue to invest in the station to make Pickering even safer tomorrow, to secure Ontario's clean power future and to make Pickering's last years the best years.

I would like to highlight some of Pickering's strong performance over the current licence term.

Pickering had an industry best all injury rate in 2017: .06 injuries for 200,000 hours worked. Said another way, this is the best Pickering industrial safety performance in the history of the site and I am very proud of our team for achieving that. Our collective radiation

exposure for workers has also been below target.

Pickering's equipment reliability has steadily improved, recording our highest Equipment Reliability Index, ERI, score in station history and it is continuing to increase. As a result, Pickering achieved record operating runs for two units in 2017, with Unit 5 at 632 consecutive days and Unit 1, 622 days. Recently, Unit 4 enjoyed a record run prior to shutting down for a planned maintenance outage on March 7th of this year.

The forced loss rate performance over the last three years has also been the best ever. And our maintenance backlog for safety critical equipment across the entire station, all six units, it is zero.

There have been no significant incidents over the current licence period. The plant has and continues to operate safely. We are pleased that Pickering received the CNSC integrated plant rating of fully satisfactory in each of the last two evaluations.

And as another major achievement, Pickering was issued a fish authorization by Fisheries and Oceans Canada in recognition of OPG's environmental stewardship for aquatic life.

These accomplishments are just a few examples to highlight Pickering's passion for excellence to protecting the public, the worker and the environment.

Investment for Improvement. In this slide I would like to impress upon the Commission some of the many significant investments we have made to further improve Pickering's safe and reliable operation.

During the current licence term, 2013 to 2017, substantial investments were made to implement numerous physical safety improvements at Pickering such as those listed on the slide. These safety enhancements significantly bolster the plant's defence-in-depth to guard against the very highly unlikely beyond design basis events.

Most notably, emergency mitigating equipment, or EME. Both Phase 1 EME and Phase 2 EME are in place and implemented at Pickering, ready for deployment in such highly unlikely events. With these safety improvements the plant is safer today than it has ever been. We will describe EME provisions in more detail later in the presentation, but for now I would just like to show you with this slide what this impressive fleet of equipment looks like.

As mentioned, we have both Phase 1 EME and Phase 2 EME. They are in place at Pickering, available, tested and ready for deployment.

Phase 1 EME consists of portable pumps and generators. The upper right, shown in red, is one of the

portable pumps. The main purpose: supply water to cool the fuel. The upper left, in green, portable generator. Main purpose: supply power to essential equipment such as instrumentation.

Phase 2 EME represents a substantial investment that focuses on protecting containment integrity. This includes larger electrical generators, such as shown here on the lower left photo. They can restore power to various containment systems, such as filtered air discharge, air conditioning units, hydrogen ignitors. There are five such generators with a total capacity of approximately 7 megawatts.

As outlined and supported in our licence application, we are requesting a 10-year licence renewal for Pickering's power reactor operating licence. The licence renewal will encompass continued commercial operations to the end of 2024, as well as transitioning the units to safe storage by 2028.

Associated with our submission is our request for the Commission to approve to operate the fuel channels up to 295,000 effective full-power hours, as this would correspond approximately to the end of 2024 for the lead unit. We consider that a 10-year licence term is 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 expedite the post-shutdown activities and ensure efficient and smooth transition to safe storage by using existing proven procedures. Please note that these type of activities are already licensed and were already successfully carried out to place Units 2 and 3 in safe storage;

It 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 station -- for the site;

And lastly, a 10-year licence renewal provides regulatory certainty for our shareholder, the Province of Ontario, and our ratepayers for continued Pickering baseload generation during Darlington refurbishment and major component replacement at the Bruce.

Pickering's commitments: Throughout our licence application and CMD, we have put forth a set of six commitments which we view as fundamental to supporting our licensing case for extended operations of Pickering station.

These are general commitments which reflect the main areas of responsibility that OPG bears to the public and to the CNSC. They acknowledge public

interest and CNSC site expectations; uphold nuclear safety, namely in the areas of nuclear safety, fitness for service, staffing, low operational impacts, public transparency and engagement, and continued investment. During our presentation today, we will briefly describe how each of these areas are addressed.

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

MR. GREGORIS: Steve Gregoris, for the record.

I am the Deputy Site Vice President for the Pickering Nuclear Generating Station. I have worked at OPG for 27 years. I started my career as an engineer at the Darlington Nuclear Generating Station when it was under construction. Since then I have held a number of positions including certified shift manager and operations manager at Pickering, and Director, Operations and Maintenance at Darlington.

Recently, I completed a secondment with the World Association of Nuclear Operators in Atlanta. This work assignment provided me with a unique perspective of the nuclear power industry, which I brought back to my work at OPG.

On a more personal note, my wife also worked for OPG Nuclear. We have lived in the Durham region

for over 20 years and have raised our family in this community.

In the next several slides, I will elaborate on our efforts in support of Pickering's fundamental commitment to nuclear safety.

Pickering's first fundamental commitment is to nuclear safety. Specifically, nuclear safety will be assured, such that plant personnel, the public and the environment are protected. I can personally attest that not only for Pickering, but across OPG's nuclear fleet, safety is our core value. It underpins everything we do at our stations. Safe operation is at the heart of our social licence and of our operating licence.

In this part of the presentation, I will touch on some key aspects that support the assurance of nuclear safety at Pickering.

Defence-in-depth is a universally accepted cornerstone of nuclear safety. With a defence-in-depth approach, multiple and redundant barriers are in place to protect the public and the environment. As depicted in this simplified illustration, Pickering has five basic levels of defence-in-depth for the overall design and operation of the station, consistent with international practice.

Defence-in-depth is extremely robust. It

encompasses engineer structures and equipment with multiple backups designed to high standards and regularly inspected, tested and maintained. It also includes people-based barriers, such as administrative processes and procedures, as well as rigorous training and the fostering of a healthy safety culture. Through levels 1 to 3, these measures serve to prevent events from occurring or to effectively mitigate unlikely events that are postulated within the plant's design basis.

With the post-Fukushima implementation of emergency mitigation equipment, or EME, during the past licence term Pickering has provided additional barriers for the extremely unlikely event of a beyond design basis accident.

Basically, in level 4, EME is used in one of two ways. First, EME is used to prevent an event from progressing to severe accident and, second, together with severe accident management guidelines, the same EME can be used to mitigate a severe accident in the extremely unlikely event one were to occur. As will be discussed later, even more defence-in-depth measures are being pursued as part of our completed periodic safety review.

Lastly, further defence-in-depth for public protection is provided in the fifth level through offsite emergency preparedness.

These barriers serve to illustrate that there are many diverse ways to put water into the reactor cores to cool the fuel under any circumstance, and because of this a severe accident at Pickering is an extremely unlikely event.

This figure is for illustrative purposes to depict the many diverse and flexible deployment options for the use of EME in the extremely unlikely event of a beyond design basis accident.

At Pickering the EME is located and safely secured onsite near to, but separate from the station. With Phase 1 EME pumps, water can be drawn from the lake and injected into 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, the Phase 1 EME pumps can provide make-up water for the irradiated fuel bays to keep the used fuel covered with water and cooled. Phase 1 EME also includes portable generators and uninterruptable power supplies to power instrumentation for monitoring.

As part of Phase 2 EME, larger generators can be used to repower various equipment, including containment air coolers, hydrogen ignitors, and a filtered air discharge system which enables controlled and filtered

venting. It should be noted that EME Phase 2 can also be used to repower station equipment that will provide additional methods of cooling, in addition to Phase 1 EME.

Staff are trained and regularly practice the use of EME. Phase 1 and 2 EME can be quickly connected to provide the necessary supplies of power and water. We have demonstrated that EME can be rapidly deployed with ample time to mitigate a wide range of extremely unlikely events.

Simply put, if ever needed, EME can be deployed virtually anywhere onsite through many possible routes and by diverse means to provide emergency water and power to cool the fuel and protect containment.

In support of Pickering licence renewal, OPG has systematically conducted a periodic safety review, or PSR. The PSR focused on safety-significant items and has confirmed that current plant operation is safe.

Furthermore, the PSR considered all aspects important to continued safe operation and concluded that the plant can be safely operated through to the end of commercial operation in 2024.

The PSR was conducted in accordance with CNSC requirements and consistent with industry best practices. It assessed the extent to which Pickering meets modern regulatory requirements and standards. And from

this part of the process, OPG identified additional safety enhancements to further strengthen the already robust defence in-depth of the plant. The safety enhancements are documented in the integrated implementation plan, or IIP, which OPG is committed to. The IIP has been accepted by CNSC staff.

On top of all the EME safety benefits, with the PSR additional safety enhancements, Pickering will be even safer in the next licence term.

The PSR safety enhancements include various plant modifications. For instance, through a station interconnection, firewater from the Units 1 and 4, diesel-driven firewater pumps, shown in the slide, will provide an additional and diverse source of firewater to Units 5 to 8. This modification will serve to further enhance the Units 5 to 8 firewater system.

In addition, 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 Pickering's defence-in-depth by providing more diverse ways, separate from EME Phase 1, to cool the fuel in the extremely unlikely event of a beyond design basis accident.

In summary, Pickering will be even safer through the IIP actions, 63 in total, to be completed by

2020. This figure shows the safety benefit of the various Pickering improvements for Units 1 and 4. It shows the results of a probabilistic safety assessment, or PSA, for large release frequency, or LRF, on a per-unit, per-hazard basis. As shown by the middle group of results, compared to the left-most group, the post-Fukushima improvements, namely EME, have significantly lowered the estimated risk for the station as it is today.

Today, the units are well below the safety goal for each hazard and have improved by factors in the range of approximately two to ten from the pre-Fukushima values. As shown by the group of results on the far right, the estimated risk will be significantly further reduced by the PSR modifications, once implemented.

In driving towards continued safety improvement, OPG has established more stringent administrative safety goals as targets. The PSA administrative safety goals are aligned with new build requirements and are one order of magnitude more stringent than are standard PSA safety goals, as shown in the figure. With the PSR modifications, Units 1 and 4 are expected to be below the PSA administrative safety goals. These goals are already met for Units 5 to 8. In summary, the Pickering plant has evolved to nuclear safety levels that are comparable to modern new build requirements.

At this point, I'd like to summarize how EME and PSR modifications work together to protect containment and the public.

Pickering has a very robust containment design. This is evident by the very low values of LRF which are below OPG's PSA safety goal. The defence-in-depth at Pickering provided by our installed design basis equipment and the additional Phase 1 EME portable pumps and generators, ensures it is extremely unlikely that a beyond-design basis event progresses to the point where containment filtered venting is required.

The PSR modifications will provide even more defence-in-depth by providing additional ways to cool the fuel, making it even more unlikely that a beyond design basis event progresses to the point where containment filtered venting is required.

Nonetheless, Pickering has filtered venting capability today through the existing filtered air discharge system shown here with no power and for multi-unit events. Further, with the addition of the larger generators of Phase 2 EME, power can be restored to the containment air coolers and hydrogen ignitors to further protect containment structural integrity, and to the filtered air discharge system to provide additional diverse ways to enable where containment filtered venting.

In summary, we are confident that the potential for a large offsite release has been practically eliminated.

Pickering nuclear safety is supported and confirmed through comprehensive deterministic and probabilistic safety analyses. These complementary tools demonstrate the effectiveness of the plant safety provisions and the robustness of defence-in-depth. For instance, our PSA confirms that the safety goals are met for each reactor unit and hazard analyzed.

You may recall during the previous Pickering re-licensing hearings, concerns were raised around the overall risk of the site and whether the estimated risk for individual units should be simply multiplied by the number of units and added across all hazards. Well, it's not that simple and there is no international consensus on whole site PSA methodology. Regardless, OPG accepted the challenge and has since completed a whole site PSA for Pickering.

OPG updated the Commission on December 14th of last year when we presented a summary of the Pickering whole site PSA. This work has been conducted in collaboration with the CANDU owners group. It is a first-of-a-kind study that is at the forefront of PSA development internationally. The work is also summarized

in addendum "C", as in Charlie, of our CMD.

The whole site PSA supports that the overall risk of the whole Pickering site is low. In fact, total site-wide large release frequency representing all units and all hazards is lower than the safety goal that is applicable for an individual unit and a single hazard. This is a strong indication of low site risk and further supports the robustness of the overall plant defence-in-depth.

We have demonstrated that the risk of a nuclear accident is extremely low. Nonetheless, we remain prepared in the very unlikely event of a nuclear emergency.

We recognize that both onsite and offsite emergency preparedness are important measures in ensuring the safety of the public. For that reason, the plans that are in place are robust. Our readiness to respond to a beyond design basis event has been recognized as industry leading, and our emergency plans have been practiced and integrated with all levels of government.

Furthermore, EME is available at both Darlington and Pickering. Procedures are issued, staff are trained, and a response using EME has been practiced in a number of drills and exercises.

OPG continues to improve in the area of emergency preparedness. We are following up to assess any

necessary changes to our plans as a result of the updated provincial nuclear emergency response plan. Various diverse means of public emergency learning are in place, including sirens, radio, television, social media, and cellphones, and OPG has worked with various government organizations on presentation-distribution of potassium iodide pills, or KI pills, to all residents, businesses and institutions within 10 kilometres of the station.

Also, a website is maintained to provide information on the use of KI pills, including in the nine most common languages spoken within 10 kilometres of the plant. Furthermore, KI pills are made available for people within 50 kilometres of the plant for anyone who wants them.

Together with various external agencies, OPG worked hard to reach out and communicate with the public about emergency preparedness. Based on polling results, we are confident that the general public knows what to do in the extremely unlikely event of a nuclear emergency.

We have an ongoing series of public communications on the topic of emergency preparedness to help keep the public informed and prepared. Public awareness sessions are held on an annual basis.

We also distribute information brochures

containing KI and emergency preparedness information to households within 10 kilometres of the station. For instance, we held our flashlight campaign in 2014 and our KI and "Prepare to be Safe" campaigns in 2015 and 2016. More recently, in 2017, we distributed emergency awareness kits to residents in the vicinity of the Pickering plants.

Commissioners, we provided you with your very own emergency preparedness kits. These are the same kits that were distributed to residents within 10 kilometres of the station for them to keep handy, just in case.

A couple items that I would like to point out with the kit: The first thing is that there is space in front of the kit. That was intentional. The "Prepare to be Safe" KI pills that were previously distributed, are meant to fit within the case so that you have everything in one package.

Also included in the case is a pamphlet that describes to residents how to be prepared and what to expect in the unlikely event of a nuclear emergency. There is also a pen with a flashlight so that instructions and information can be read even in the case of loss of power and there is a magnetic checklist to make sure that you are prepared that can be placed anywhere convenient so it can be easily referenced.

The last thing I would like to point out is that this kit provides information to the public so they can be prepared for any emergency such as a loss of power and not just a nuclear emergency.

Our biggest test of emergency preparedness at Pickering took place in 2017. On December 6 and 7, we led the execution of Exercise Unified Control, where more than 800 participants, from over 30 agencies, federal, provincial, municipal, and non-government agencies, participated over the course of two days.

The following video will provide an overview of Exercise Unified Control.

--- Video presentation / présentation vidéo

MR. GREGORIS: Commissioners, we hope you found the video both enjoyable and informative.

I would like to note that the exercise was based on a severe accident scenario. EME was deployed, filtered venting was required, and protective action limits were reached, requiring evacuation.

There were also several new innovations employed during the exercise. For example, the new Unified RASCAL Interface, or URI, dose projection software was used by OPG, the province and the CNSC. The real-time automatic data transfer plant information emergency summary page was accessed by the CNSC and the province, and the new P25

radio system, common between OPG and Pickering Fire Services, was used, enhancing communications between these groups.

Exercise results demonstrated that there are robust emergency plans in place at all levels to deal with a nuclear emergency. Further enhancements to these plans are being implemented as part of the lessons learned.

Of particular value, this exercise strengthens the relationships with the various participating agencies. This will further ensure effective and well-coordinated response activities in the unlikely event of a nuclear emergency.

I will now pass the presentation over to Stephanie Smith.

MS SMITH: Good morning. I'm Stephanie Smith, for the record. I am the Director of Operations and Maintenance at Pickering, which is otherwise known as the plant manager.

I have worked for OPG Nuclear for 28 years. I spent nine years as a certified shift manager. I have experience in engineering operations, maintenance and fuel handling.

I've also had senior emergency roles in the OPG nuclear emergency response organization, including emergency shift manager, operations support manager, and

emergency response manager.

I too have lived in the Durham Region for the last 26 years, and I have raised a family here as well.

I'm now going to talk about fitness for service.

With respect to fitness for service, our stated commitment is as follows.

Systems, structures and components at the plant are fit to continue commercial operations to the end of 2024, and the inspection programs will ensure fitness for service during the next licence period. In the next couple of slides, I will discuss how this is supported by our aging management program. I will also explain how we ensure our fuel channels are safe and robust.

The comprehensive programs that are in place today are how we always know that the plant will be safe and reliable to operate to the very last day. We know that the condition of equipment in a plant can change gradually over time. That is why we have in place an effective and comprehensive aging management framework to ensure that critical safety equipment remains fit for service at all times.

We know that the plant is in good condition. We know because we inspect. Periodic inspections are rigorously performed on all major

components and structures to ensure fitness for service on an ongoing basis. Component and equipment health is evaluated regularly and trended by means of technical evaluations, inspections, maintenance, and testing in accordance with the requirement of applicable standards, OPG's integrated aging management program, and the life-cycle management plans which are in place for major components, such as fuel channels, feeders, and steam generators. These plans are submitted to the CNSC staff regularly.

Fuel channels. We appreciate that fuel channel fitness for service is a topic of specific regulatory interest, especially in the context of extended operation. OPG can assure the Commission, the CNSC staff, and the public that the fuel channel fitness for service will be maintained, with margin, to the end of 2024 for all Pickering units. This corresponds approximately to 295,000 effective full-power hours for the lead unit. At this service life, there's still ample margins to the fuel channel criteria. This is true for all of our units. The projected hydrogen equivalent levels, less than 100 ppm, are well within the validation basis of the fracture toughness models that are used to support fuel channel fitness for service.

Our confidence in ensuring fuel channel

fitness for service to 2024 is based on technical assessments, industry research, a well-established aging management program, and the mitigation measures to ensure ongoing fitness for service. We have committed to the IIP actions to support safe operation of the fuel channels to 2024. In short, we understand the fuel channel aging process, and have proven our ability to manage it well.

A more detailed and scientific explanation in support of the assurance of the fuel channel fitness for service is available in Addendum B of our CMD.

MR. LOCKWOOD: Thank you, Stephanie. For the record, Randy Lockwood.

Engage workforce. Staff are qualified and competent to operate the plant, and this will be maintained throughout the next licence period, including sufficient staffing numbers.

Staff engagement is a very important underlying part of this. I will briefly talk on some of the related topics of staff qualification, safety culture, and staffing management.

An engaged workforce is about having the right number of people, with the right skills and the right attitudes, doing the right work at the right time. Our nuclear management system provides a framework that establishes the process and programs required to ensure

Pickering achieves its safety objectives, continually monitors its performance against these objectives, and fosters a healthy nuclear safety culture. This is not possible without an engaged workforce that is aligned around common goals. It starts with awareness, understanding, and commitment by all levels of the organization. It involves promoting individual and department ownership and accountability, and it drives multifaceted initiatives all the way from the front-line worker to the leadership level.

Our extensive training programs are used to develop and maintain competent personnel, with the necessary skills and knowledge to safely carry out their work.

We periodically evaluate our safety culture to recognize positive attributes, and to identify areas for further improvement. A panel, consisting of the senior plant leadership team, meets each quarter to discuss the status of the nuclear safety culture at Pickering. A station-wide assessment was conducted at Pickering in 2015 and concluded that there is a healthy nuclear safety culture, a healthy respect for nuclear safety, and that nuclear safety is not compromised by production priorities. Another station-wide assessment is scheduled later in the year.

Our safety culture is also subjected to periodic external evaluation by industry peers, which confirms our safety culture.

We have initiatives under way to address OPG's demographics, especially through investments in knowledge management for ongoing operations.

Long-term hiring strategies are also in place to address staffing needs through to and beyond the shutdown of the station.

To ensure a supply of leaders, and a continuity of critical roles, a company-wide succession-planning process is in place. Staff engagement and motivation will remain a key focus at Pickering to ensure continued safe and reliable operation.

With respect to the impacts of normal operation, our stated commitment is that impacts of plant operation to the public, workers and the environment will continue to be of low risk, and adequately mitigated, while continuing to provide the various societal and environmental benefits of plant operation. This encompasses a wide range of topics. I will touch on a few of these topics in the upcoming slides, and our CMD does have more information.

Our performance is strong in all areas of environmental protection. For instance, our targets for

radiation dose to the public are much more stringent than regulatory limits, and we strive to keep them as low as reasonably achievable. The public radiation dose from Pickering remains a fraction of the 1 percent of the regulatory limit, and is negligible in comparison to natural background radiation levels.

Our environmental monitoring programs in the vicinity of Pickering assess the impact of operations on the environment and human health. Results are made available to our community and to the public on our external website.

Pickering is continually working to reduce the amount of low and intermediate level nuclear waste it produces, thereby reducing our environmental footprint so that future generations will not be unduly burdened.

Pickering's irradiated fuel bays provide a storage of used fuel until it can be transferred to the dry storage containers for interim storage at the separately-licensed Pickering waste management facility.

Also, in January of this year, Fisheries and Oceans Canada issued a fish authorization for the Pickering station in recognition of the mitigating measures in place and planned for aquatic species. This is, in part, thanks to our successful fish-diversion system, which features an extensive net that can be seen in the photo.

We are very, very proud of our safety record, and we work hard to maintain a safe work environment. Our conventional safety performance remains strong.

With respect to radiation safety over the licencing period, there were no radiation exposures at Pickering that exceeded regulatory dose limits or our much more stringent administrative dose limits.

Collective radiation exposure is an industry standard measure of radiation safety performance. Our performance in this area has been better than target in each year during the current licence term. We attribute this success in part to our As Low As Reasonably Achievable, or ALARA, safety culture, and to the programs and industry-leading technology that our staff have developed through innovation to minimize radiation exposures.

The following are just a couple of examples.

Major reductions in reactor-phase dose rate have been achieved by installing a combination of an overhead shielding canopy and end-fitting shielding tiles.

Also, we are using robots to avoid worker dose, and to improve monitoring of the plant. These robots, as you can see in the upper corner there, are used

in high gamma, neutron, tritium environments. They are very versatile and can help with equipment monitoring and inspections, and to support dose-mapping strategies for personnel entering medium or high hazard areas. These robots can go virtually anywhere in the plant, and, as such, they significantly help to reduce worker dose.

I will now pass the presentation back to Randy Lockwood.

MR. LOCKWOOD: Thank you, Stephanie.

For the record, Randy Lockwood.

OPG recognizes that members of the public, stakeholder groups, and local communities have a legitimate interest in Pickering operations. For that reason, we remain open and transparent, and frequently engage with these groups.

Our stated commitment, transparency and appropriate public and indigenous engagements, will continue. In the area of the Pickering station, OPG is aware of the aboriginal and treaty rights, interests and assertions of several indigenous communities. These communities include Williams Treaties First Nations, on whose traditional territory the station is sited, as well as the Mohawks of the Bay of Quinte, and the Métis Nation of Ontario, Region 8. OPG meets regularly with these representatives from these communities to provide details

of our nuclear operations, and to address any issues and concerns. We take these discussions very seriously and follow up on all feedback that we receive.

From a company's perspective, the OPG indigenous relations policy provides guidance and direction to ensure that meaningful discussions and information transfer occurs consistently across the entire province. In June 2017, OPG made changes to its supply chain policies and processes to encourage and support those indigenous businesses, who have a desire to become active vendors in the OPG supply chain. A minimum 5 percent indigenous content goal is now assigned to bids, and OPG encourages our existing vendors to formulate joint ventures and subcontracting opportunities.

As a company, OPG has successfully partnered with indigenous communities on hydro electric projects. In each case, the first nation is an equity partner and will earn a long-term stable source of revenue. These first nations also benefitted from the construction of these facilities through employment and procurement.

As well, OPG and Nanticoke Solar are working with Six Nations Development Corporation on a solar generating station on the site of what was once Ontario's largest coal-fired generating station.

Part of our indigenous engagement takes

place through a corporate citizens program. In 2017, OPG funded 84 indigenous community projects focused on youth, science, culture and sports.

At OPG, we're committed to gaining a greater understanding of indigenous peoples' cultures and traditional land use.

Public trust is a core key driver of our social licence, the ongoing approval of the community, and other stakeholders for our operations. It requires daily commitment. It means being part of the community, sharing its values, and supporting what matters to the community and to ourselves. In Pickering, that means meeting regularly with elected representatives and community members, it means partnering with dozens of environmental, educational, and community-building groups. It's a commitment we hold dear and that we demonstrate every day through our support of the community's safety and environmental causes, because our employees don't just work in the region, they live there too.

In keeping with the spirit of openness and transparency, a substantial amount of information is made publicly available on our external website, including numerous documents associated with our present licence renewal request. Such documents include key PSR documents, as well as PSA summary reports.

Continuing to invest. A recurring theme you heard us say today is how OPG is continuing to invest in the Pickering plant.

Our commitment. OPG will continue to invest in Pickering to support our objectives, including to improve equipment reliability to ensure fitness for service until the end of commercial operations, and to further enhance nuclear safety.

In addition to some of the physical improvements already described in the context of enhanced nuclear safety, our continued investments include additional inspections and maintenance of critical components to ensure safe and reliable operations.

We're also continuing to invest to protect the environment. Whether it's through implementation of dikes at the station, the establishment of biodiversity and wildlife habitat programs, or our ongoing salmon stockade program, we will continue to invest.

At OPG, we will continue to invest in our people, our plant and in support of our community. At Pickering we're also investing and leading the industry in the development and the application of innovative technologies.

This short video highlights our use of innovation and technology to improve safety, reliability

and station culture.

--- Video presentation / Présentation vidéo

MR. LOCKWOOD: Over the next licence term we plan to continue investing over \$300-million of committed actions in support of extended operations.

This slide summarizes that a high level were just some of the -- are key areas our investments are aimed at. With these investments the plant will be even safer and more reliable in the future.

End of commercial operation. At OPG we have extensive experience not only in operating reactors for power production, but also managing the successful transition to their eventual permanent shutdown. With the end of commercial operation partway through our requested licence term we understand the need to carefully plan the various activities that will ensure not only a smooth and safe post-shutdown phase, but also a safe transition period in the time before shutdown.

On the next slide I will briefly explain how we plan to address these considerations into our sustainable operations plan and our post-shutdown stabilization activities plan.

In looking ahead into the transition period from the operating station to the end of commercial operation, we understand the special considerations

involved. This is part of our sustainable operations plan or SOP.

The SOP will be submitted to the CNSC staff five years before permanent shutdown of the first unit at Pickering.

Upon the end of commercial operation, stabilization activities include the defueling and dewatering of the shutdown reactors. The stabilization activity plan or SAP documents OPG's planning efforts for stabilization of the Pickering station and the safe storage state.

Both the SOP and the SAP comprehensively take into account all of the 14 CNSC safety and control areas in the context of these transition periods. We're highly confident in our ability to safely execute this work as evidenced by the successful safe storage of Units 2 and 3 which have been in place for several years now and which will inform our plans for the rest of the units.

Furthermore, we have conducted a predictive effects assessment and concluded the associated activities are of low risk to human health and the environment.

At this time I'd like to share with you a video that reflects our enthusiasm and optimism around Pickering extended commercial operations to 2024.

--- Video presentation / Présentation vidéo

MR. LOCKWOOD: As a team, we're very proud of that video's message. It reflects who we are, that's our plant, and we're proud to work, live and be a part of the local community.

In summary, I would like to reiterate the importance of Pickering in providing clean, safe, reliable, low-cost electricity to the people of Ontario.

We continue to protect the public, the workers and the environment and we continue to foster open and respectful relationships with the communities that have understandably interest in our operations.

At OPG, nuclear plants have had a long history of safe operation. We are one team, we are one OPG and our staff have remained and will continue to be highly skilled, engaged and motivated in keeping Pickering operating well now and well into the future through to 2024.

The Pickering plant has continued to evolve and improve over time, meeting or exceeding regulatory requirements and applicable standards. To this end, we have seen increasing high levels of plant performance, some of the best ever in the history of the plant.

Through continued investments, the

Pickering design has advanced to be safer than ever before. Through the integrated implementation plan, Pickering will be even safer going forward.

In conclusion, we're confident that OPG is qualified and the Pickering plant is able to continue its safe and reliable commercial operations through to the end of 2024 and to transition the station to safe storage by 2028. In doing so, we will continue to make adequate provisions to protect the public, the workers and the environment while respecting our national security and international obligations.

To close, I would like to speak to the image on the slide. For the context, very large flags hang on each end of both turbine halls at Pickering.

On one end an Ontario flag. It reminds us of our role, power with purpose, to provide clean, safe, reliable, low-cost power to the people of Ontario and to provide this power in a consistent and transparent manner that maintains public trust and confidence. We will always operate our station with minimal impact to human health and the environment.

On the other end of each turbine hall hangs an equally large Canada flag. Pictured here some of the team members that helped hang those.

We're proud of our heritage and the

important role Pickering plays in the CANDU industry. An image of the Pickering station is synonymous with Canada deuterium/uranium technology throughout the nuclear industry worldwide. I know this to be true having worked offshore in the industry for more than a decade.

Commissioners, the Pickering team are engaged and they're determined to continue safe and reliable operation of our station to 2024. We are -- we're the best team in the industry and we're committed and we're aligned around one simple mission, safely operate Pickering with improved performance year over year such that our last bit is our very best.

It's been a pleasure and an honour to appear before you today and speak on behalf of the Pickering team. Thank you for your attention and we'd be pleased to take any questions you may have.

THE PRESIDENT: Thank you. You gave us a lot to chew on, which means it's lunchtime.

--- Laughter / Rires

THE PRESIDENT: So, we will resume the hearing at 1:30. Thank you.

--- Upon recessing at 12:35 p.m. /

Suspension à 12 h 35

--- Upon resuming at 1:33 p.m. /

Reprise à 13 h 33

THE PRESIDENT: Good afternoon.

I would like to move now to the presentation from CNSC staff as outlined in CMD 18-H6 and 18-H6.A. I understand that, Mr. Frappier, you will start the presentation. Over to you.

CMD 18-H6/18-H6.A

Oral presentation by CNSC staff

MR. FRAPPIER: Thank you.

Thank you and good afternoon, Mr. President, Members of the Commission.

For the record, my name is Gerry Frappier and I'm the Director General of the Directorate of Power Reactor Regulations here at the CNSC.

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

Also, regulatory and technical staff from CNSC are present and will be available to answer questions, should the Commission have any.

--- Upon resuming at 4:09 p.m. /

Reprise à 16 h 09

THE PRESIDENT: Okay, we are ready to proceed.

Ms Velshi, you have the floor.

Okay. Dr. Demeter...?

MEMBER DEMETER: Thank you.

I had a question for Health Canada if they are still online.

THE PRESIDENT: Health Canada is here or online?

--- Laughter / Rires

MEMBER DEMETER: It's kind of like the Elvis story, they have left the building, right.

So referenced in the emergency planning talk was your 2016 Canadian guidelines for protective action during a nuclear emergency and that was a 2016 draft. So one clarification. Is it still a draft or if it's not, what's the date for the final?

The second part of that is you have a complementary document -- and I must have seen it somewhere, I can't exactly reference it -- for dosimetric criteria for nuclear emergency planning and response, a 2017 draft. Is there any information in that document that

might further influence PNERP or is it in conjunction with PNERP?

So the first one is, is the first one still a draft or what's the deadline for finalization? The second one is the second document, because it deals with dosimetric criteria, is it going to influence PNERP?

THE PRESIDENT: And the third one is what can it tell us about recovery?

MR. AHIER: Brian Ahier, Health Canada, for the record. Thank you for the question. I'm glad you asked it when you did as I was just on my way out.

So you have referenced two documents. In fact, they are one and the same document. So the 2016 draft was using a previous title for the document, which was basically the same as the previous 2004 version. The title of the document was revised to "Generic Criteria and Operation Intervention Levels for Nuclear Emergency Planning and Response" because in fact that is exactly the information that's in the document. So the title now aligns with the content.

This is a document that has been in development for several years. It has been finalized. It was finalized in 2017. It was improved internally within Health Canada in 2017 and now it is just going through the final formatting process so that it can be published and

then posted on the Canada.ca website. So that document is finalized.

You have asked what the link is with the Provincial Nuclear Emergency Response Plan. The document was developed in very close collaboration and consultation with our federal-provincial-territorial stakeholders, so it went out for a couple of rounds of public consultation. It also had a couple of rounds of consultation, both multilateral and bilateral conversations with the provincial organizations. All the stakeholders, whether they were federal or provincial, provided quite a bit of feedback, which is why it took a bit of time to get the document into the format that it is, but it was very good feedback. It recognizes the fact that they are guidelines, which means that they are voluntary, we can't force them on the provinces, so we wanted to take the time to get the agreement of our stakeholders such that they would be incorporated. And in fact, we are actually quite pleased that we have produced a very good document and they have been incorporated into the Ontario Provincial Nuclear Emergency Plan and in fact New Brunswick is on the point of adopting them as well once it's formally published. So there is a close link between the PNERP and the Health Canada document on generic criteria and operational intervention levels.

And to segue into the third question, the document does not address long-term recovery. There is generic criteria and an operational intervention level for relocation, but we made the conscious decision to leave the recovery part for another document, and that is a document that is being led by the CNSC with the involvement of Health Canada and that's the framework for recovery. And we would expect to see some sort of alignment between at least the relocation criteria that we have in the generic criteria document and then what eventually gets captured into the recovery framework document.

THE PRESIDENT: So CNSC, give us a sense of the timing on this.

MS PURVIS: Good afternoon. Caroline Purvis, Director of Radiation Protection Division, for the record.

So the REGDOC, we are tentatively planning to publish for public comment -- this is the recovery REGDOC -- in the summer. This has followed a discussion paper which was published in 2017 where we went out to seek stakeholder input on the development of a REGDOC that would cover the aspects of recovery.

THE PRESIDENT: Dr. Demeter...?

MEMBER DEMETER: That's good. I'm glad you clarified that it has been put into one document.

Division.

The Independent Environmental Monitoring Program doesn't really interact with the *Fisheries Act* authorization. We are adding fish to the IEMP at Pickering, but it is not in relation to the *Fisheries Act*.

Something I will add is that you won't see this *Fisheries Act* authorization in the LCH, in the Licence Conditions Handbook. As OPG is responsible for following all authorizations that they have, it's under the MOU that CNSC gets involved in reviewing. And we are actually right now going through the *Fisheries Act* authorization line by line to ensure that we have a robust compliance program to ensure that OPG is meeting all their requirements on behalf of DFO.

THE PRESIDENT: So right now, are both CNSC and DFO satisfied with the way the authorization is being executed? DFO, why don't you start?

MS THOMAS: Thank you. It's Jennifer Thomas, for the record.

To date, yes, we are satisfied with the way the authorization is being implemented. I don't know if CNSC wants to add anything.

DR. DUCROS: Caroline Ducros, for the record. I will concur.

THE PRESIDENT: Thank you.

MEMBER PENNEY: Thank you.

THE PRESIDENT: Back to Mr. Berube.

MEMBER BERUBE: I'm just looking at the timeline for this proposed licensing phase here and of course we are seeing a lot of transition, a lot of activity. We have already spoken to that. I am more curious about the actual SAP phase of this thing because at that point we are going to start tearing things apart and moving a lot of materials, certainly activities that have been done before but not at this magnitude and probably not at this speed. I'm curious, the question specifically I have is, looking at the four-year timeline that you have to actually turn this into a safe storage state, if you are going to make the end of licence as indicated on Slide 23 here as presented by the staff, do you feel that you actually have the resources to do that? How firm are you with this?

MR. LOCKWOOD: Randy Lockwood, for the record. I appreciate your question. Again, I will direct Art Rob to speak to the details.

You make mention, yes, there's Unit 2 and 3 that we have experience from, but we also are informed from recent activities at Darlington refurbishment in terms of how to defuel the reactor in a timely manner, as well how to drain the heat transport, how to drain the

moderator. So there's a lot of learnings and experience coming from that as well, not just Units 2 and 3. And in terms of timelines, we can probably look at how long it is taking to do those various activities at Darlington and extrapolate them over to Pickering, right, which will be undoubtedly quite a bit different from 2 and 3, off the top of my head, just because of the way that things have evolved. It is probably a good point for Art to talk a little bit about the details of the planning of the various activities in the SAP phase.

Art.

MR. ROB: Art Rob, for the record. Thank you for your question, Commissioner.

The question you had was about the magnitude of products and how fast we have to deal with them as we go through the decommissioning phase. I guess just to be clear on the record, the preliminary work we are going to do as part of the licence period is to actually safe-state the reactors on the six units at Pickering. Safe-stating for us involves of course removing all the fuel and all the water in the reactors and then end-stating some of the systems to reduce the actual maintenance burden and simplify the plant footprint. As part of that work there is of course some known work as we have learned from the previous safe-stating at Pickering 2 and 3. We also

benchmark of course in industry with our industry partners and Hydro-Québec and learn what they have learned through the process of doing that, but it's not the actual -- that phase of the work is not the demolition of the plant and there isn't large quantities of waste or something like that to be generated or transferred during this period of time.

MEMBER BERUBE: Okay. Thank you for that.

Staff, just out of curiosity, based on our monitoring activities of what has happened at Pickering so far and our understanding of their performance, do you think that these timelines are reasonable?

MR. FRAPPIER: Gerry Frappier, for the record.

Yes. As mentioned, the big steps that we would be looking at having there is defuelling the reactor and then moving to dewater it. Both of those steps are pretty well understood. Of course fuelling, they are doing on a constant basis, so the timelines we would see as being appropriate timelines. And they will, at the point of 2028, come back for a new licence and at that point in time they would be looking at some of the perhaps more difficult steps of the operation.

MEMBER BERUBE: So just to follow on that, we would be talking about human resources, but this can be

done comfortably in this timeline? There is not going to be pressure on staff at these facilities to actually move at a pace such that it could increase the potential risk to their radiation protection, security, safety, that kind of thing?

MR. ROB: Art Rob, for the record.

I guess one of the things I want to assure the Commission of course is that, much like most work we do, we want to protect of course the strong plant performance this plant has enjoyed as it moves towards the end of its life. Keeping that in mind, we do the detailed planning for doing things like decommissioning in this first phase of safe-stating the units. Those are primary areas of focus, the safety and of course the security, the rad dose that people will take doing this work. These are all important considerations in the detailed planning that we are doing for that work.

Currently, I would say that there is the pace of decommissioning or the pace of safe-stating these units is something I think that is fairly well understood and of course it will count on us with some of the technical limitations of the plant, but for the most part I think the staff part is not the biggest risk to that work being completed safely.

MEMBER BERUBE: Thank you.

MR. FRAPPIER: Gerry Frappier, for the record. Perhaps I would ask Dr. Al Omar to add to that from a staff perspective.

MR. OMAR: Al Omar, for the record.

I think this is why we required OPG to develop and submit the SAP three years before they get into the stabilization agreements. I think the concern here will still continue to be how you transition even the workforce from a workforce to shut down to a workforce to stabilization. So you may need some new skills and knowledge. You may change the workforce and base it on outsourcing, for instance, but there will be change in the staff. In addition, we will be looking into perhaps developing new tools maybe for that based on the experience of Unit 2 and 3. How you are going to deal with some units shut down but stayed in guaranteed shutdown state while you are defuelling, dewatering at least two units at a time. How are you going to deal with the fuel transfer from the reactor to the wet storage, the irradiated fuel bays, and so on and so forth. I think what we have to do is during the submission, development of the SAP from 2022 to 2024, I think we will go, as we used to do for the SOP, just to see whether the expectation and what OPG will manage, even transition in the organization itself will be sufficient for the staff to be satisfied that the activities

undertaken between 2024 and 2028 will continue the units to be safely operated or surveillanced, as well as how they manage again the human element itself. How will you manage human performance that will continue into the SAP.

I would like to invite my colleague Ed Leader just to add the site experience during the shutdown of, and isolation of, 2 and 3.

MR. LEADER: For the record, my name is Ed Leader, I am the Power Reactor Site Office Supervisor at the Pickering site.

Just to add to Al, our current compliance verification plan goes out five years. Our compliance verification criteria will not change during that period and, as Al said, once we get the initiation of the SAP, then we will adjust our compliance verification criteria accordingly. But we do have experience monitoring Units 2 and 3 safe shutdown. We did a separate project for that and there was no additional risk to the workers, public or the environment during that project.

THE PRESIDENT: Thank you.

Dr. Lacroix...?

MR. GREGORIS: Steve Gregoris, for the record.

I just want to add, for the activities that we are looking at in the SAP specifically, so those

are activities that we perform on a daily basis or in outages, so we do for the most part have procedures to defuel and to dewater. We drain the moderator systems in outages, so we know how to do that. We have proven procedures and we know how to manage those processes and that draining safely. We also partially drain the heat transport systems, so again we know how to move that water and do it safely.

I also want to stress that most recently with Darlington Unit 2 we have proven technologies to drain and dry these systems. So that again, as Mr. Lockwood mentioned, is valuable experience for us to bring forward so that we can do this work safely, we can do it correctly and in a timely fashion.

THE PRESIDENT: Okay. Thank you.

Dr. Lacroix...?

MEMBER LACROIX: Out of curiosity, what do you do with the water? Can you reuse it in other facilities or do you simply dispose of it?

MR. GREGORIS: I'll ask Art Rob to speak specifically because that will be a larger quantity of water normally, but we certainly have facilities to store the water, we certainly want to keep the water, it's D2O, so it's worth a lot to the industry and so our intention is to have the ability to store that water and to hold onto

it, but I'll ask Art to speak to the details.

MR. ROB: Art Rob, for the record.

So the D2O product, as Steve mentioned, there is a quantity coming available as Pickering shuts down. There is about 3,500 megagrams of heavy water on the Pickering site. The plan detail -- detailed planning is looking at places to actually store the water. And actually between the two facilities, Darlington and Pickering, there is enough purpose-built tankage to actually store all water safely during the transition time.

Overall in the industry, OPG is looking at a long term strategy for heavy water and, of course, the other players in the Canadian market of course are also looking with interest at the overall long term plan for heavy water management.

MEMBER LACROIX: Okay, this is my real question now.

--- Laughter / Rires

MEMBER LACROIX: We changed from a safety and controlled area of security.

On page 112 of the licence application, there is one page devoted to cyber security, and I must say that although I sort of understand that you are in the process of complying to the regulation, this is my perception.

First, I will give you my perception of cyber security and next I will ask you, I would say, a multifaceted question.

To me, cyber security is the protection against malware, that is, software that may corrupt, steal, or destroy data, but it can also destroy physical objects, such as pumps and generators. So the first part of my question is that, is the philosophy of cyber security implemented at OPG similar to the defence-in-depth that has been adopted for the physical facilities?

And the second part of my question is, are you aware of any attempt to infiltrate your system at Pickering, how many times, and what sort of a threat are you facing? Is it from outside? Is it from inside?

And before you answer my question, don't spare me the technical details. Please, talk to me about firewalls, encrypted files, blocked USB flash drive boards, system robustness, redundancy, quarantine, anti-virus, isolation, cloud computing, air gaps between internet and your computer system.

Thank you.

MR. BURNS: First of all, thank you for your questions. Scott Burns, for the record.

I'm not going to be able to answer your technician question, but I'll give an overarching answer,

and then Mike Benjamin is here with us and can provide some more details, based on your question.

So OPG does take cyber security very seriously. We do have an overall defence-in-depth philosophy. We manage our assets in a secure, vigilant, and resilient manner.

We have been working hard at cyber security improvements on the site since 2010 and our goal to be compliant with the CNSC standard is to have all of those aspects of our system completed in 2019.

We have done this on a priority basis and we initially looked at our significant cyber assets first, so in terms of the nuclear operations, security systems, emergency preparedness systems and fire systems. Those are some of the significant assets, and then we are looking at some of the more cyber essential assets in terms of the next level of priorities.

We do have awareness campaigns in terms of the phishing. So we test our employees right across the country. That's been a very successful program to educate and provide awareness for all of our employees around the importance of being aware of potential attacks. So we actually have phishing exercises and validate and measure how we're doing there. That has been effective in educating our staff and creating a greater level of

awareness.

In terms of answering some of the detailed aspects of your question, I would turn it over to Mike Benjamin, our manager for cyber security.

MR. BENJAMIN: Thank you, Scott.

My name is Mike Benjamin. I am a Senior Manager, Cyber Security for OPG.

As Scott said, since 2010, we've had robust controls in place to protect those -- especially those assets, significant cyber assets that support nuclear safety functions.

And OPG does display an overall defence in-depth strategy. This is right across the company. We have a matrix organization integrating our security for the business, our renewable generation stations, and as well as our nuclear plants. This defence in-depth strategy takes the place of technical administration and operational controls.

Most importantly, our industrial control systems are isolated and segregated, separated from the business IT side. But the defence in-depth is broader than that. We isolate. We have intrusion detection systems. Our perimeters are controlled by firewalls. Technical controls are things like these firewalls.

THE PRESIDENT: Be careful with security,

technical security, things that describe the information. So keep it general, please.

MR. BENJAMIN: Okay, I will.

We do have operational controls as well and things like bringing USBs. There are specified procedures that a USB must be scanned before it's put into a piece of control equipment.

We have a systematic approach to training in OPG nuclear that also applies to cyber security. So our cyber security specialists -- our subject matter experts have specialized training, that is that they have to qualify for.

All of our nuclear employees have general employee training every year where they have refresher training on awareness. And as Scott said, we have monthly campaigns to train our employees to recognize and report emails that are being sent into the company to try and fool them into losing their credentials or introduce malware.

Without going into any details, you're asking, how do we have incoming threats? One of the major threats faced by the company is those types of phishing emails which we recognize and eliminate once we find them.

We also recognize that things do happen, so we spend a lot of time in emergency preparedness and incident response. Specifically, last year we took place

in the GridEx exercise right across North America. There were over 450 organizations that took place. This was right across North America including utilities. That was combined cyberattacks along with physical attacks on our nuclear plants. We included our nuclear plants in that exercise as well as our renewable generation plants.

We also are very much working with other industries. We have joined the new Canadian Cyber Threat Exchange where we trade intelligence with industries across Canada.

Within Ontario, we have monthly cyber meetings to collaborate with Hydro One and the ISO to exchange operating exercise and intelligence.

And of course, we're moving to the new CSA N290.7 standard. That's being done in collaboration with the other CANDU owners, through the CANDU Owners Group. So we're working very closely with CNL, with Bruce Power, as well as Point Lepreau, so as we broaden our existing controls and make sure that we all move together towards the CSA N290.7 compliance.

THE PRESIDENT: Okay. Thank you.

MR. BENJAMIN: Thank you.

MR. LEMOINE: This is Eric Lemoine, for the record, if I could just add CNSC's perspective on that. I'm over here. Sorry.

--- Laughter / Rires

MR. LEMOINE: So we actually did a Type 2 cyber security inspection in February of this year against the current requirements in the Licence Condition Handbook, and a preliminary summary of findings was shared with OPG. The inspection report is not complete yet.

I can't get into the details of the findings unless we were to go *in camera*, for example, but what I can say is that the Pickering cyber security program does meet the current requirements and there were no safety significant findings.

THE PRESIDENT: Okay, thank you.

I would like to move -- Ms Velshi...?

MEMBER VELSHI: Thank you. A question on periodic safety review, so if we can turn to Slide 17 of staff's?

So this slide shows that the CNSC staff identified 23 gaps. It's a very simplistic question. Is this something that OPG should have picked up? Is there judgment involved in identifying gaps?

MR. FRAPPIER: Gerry Frappier, for the record.

I would ask Dr. Al Omar to respond to that.

DR. OMAR: Al Omar, for the record.

These involve coding standards and safety factors -- we call it task reviews -- really requires the assurance of existence of things or adequacy of things or effectiveness of things, things meaning programs, procedures.

So when OPG submits these documents as well as the reassessment of the original continued operation plant, continued operation plant is equivalent to an IIP, integrated implementation plan. That was produced back in 2010 for the Pickering B original refurbishment.

So when you reassess the continued validity of the continued operation plant findings to close to 2020, by operating to 2024, there is different perspectives from the way the licensee see the reassessment from the way the CNSC staff see it and make the determination on the necessity to continue a particular issue or elaborate on a particular issue. Most of our findings came, in fact, from the reassessment of the continued operation plant and the impact of operating to 2024 on the original findings.

Another major assessment came from OPG's reassessment of the Fukushima action items and we found that we have some issues that have to be included in the current IIP to ensure the integrity of containment under severe accident.

MEMBER VELSHI: Thank you.

And then I also read -- I think it was one of the IAEA/OSART recommendations was that the periodic safety review safety should have looked at waste management facilities. And I know you said Pickering has got an implementation plan to address those recommendations.

Before I come to Pickering, did I get that right that waste management facilities were not assessed as part of the PSR and should they have been, or will they be?

MR. VIKTOROV: Alex Viktorov.

We briefly know whether the waste management facility or waste management practices outside of a power station were not part of some scope. Therefore, relatively well defined standard scope of their emissions, and we went with that.

Again, the waste management facility at Pickering site has a different licence and governed by different regulatory requirements, and different practices. However, we are considering right now expanding the PSR practice to other facilities.

MEMBER VELSHI: So as far as the specific recommendation of the IAEA or OSART is there -- what would the action item say to that recommendation?

Maybe I should ask Pickering that because I guess their recommendation was to you.

MR. GREGORIS: Steve Gregoris, for the record.

I am going to ask Mike Ruffolo to speak to the details of your question.

MR. RUFFOLO: Mike Ruffolo, for the record. I'm the manager of the periodic safety review for Pickering.

Just simply, there is -- there is currently no plan to do a periodic safety review for the Pickering waste management facility. I'm not aware of a plan to do such an exercise going forward.

MEMBER VELSHI: And correct me if I'm wrong, that was a specific recommendation or it wasn't a recommendation?

MR. FRAPPIER: Gerry Frappier, for the record.

So I think we're not quite following your line of questioning. So in the OSART area there was not a recommendation.

--- Pause

MR. FRAPPIER: Okay. So maybe we're just a bit confused as to what area you're talking about.

While you're looking for that, I think Mr. Jammal wants to add something.

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

record.

With respect to the use of the periodic safety review for waste management or low-risk facilities that is wishful thinking from the IAEA perspective. So the implementation for the PSR for low-risk facilities or even waste facilities is a work in progress. So it's a potential future recommendation based on the adoption of each member's state with respect to a future to come of periodic safety review.

To date, there is no standard to be used for waste facilities. I want to make that clear from the Commission's perspective.

Usually, in the peer review submissions, they will make a reference to good practice of another country that is using a PSR or other methodology with respect to the waste management. In Canada, we do not use enriched fuel and we do not do repossessing, so the PSR really to such a low-risk facility does not add any safety value.

MEMBER VELSHI: Thank you. That's very helpful.

And then just for my benefit, Pickering, what's the level of effort involved in doing a PSR?

And then I'll ask the same of staff. I mean, is this years of work? Okay.

MR. RUFFOLO: Mike Ruffolo, for the record.

The Pickering PSR2 took about two and a half years to prepare to get to this point.

MEMBER VELSHI: How many FTEs?

MR. RUFFOLO: Well over 100.

MEMBER VELSHI: Thank you.

And staff?

MR. FRAPPIER: Gerry Frappier, for the record.

So, undertaking that periodic safety review is a major undertaking. It's a very extensive review of both what is your current state of your facility, and also how does that compare to modern standards, which of course your facility would not have been built to.

In the particular case here, just so that we're clear, Pickering had done a periodic safety review a few years back, thinking they were closing in 2020. With the decision to continue operation to 2024, we require them to do a delta PSR, if you like, so a more fulsome PSR than what they had looked at before. But even in that case, it's still a major undertaking with certainly a couple years of effort and, as mentioned, hundreds of people on their side.

Similarly on our side to review it is a

major review that took -- takes us certainly a year or so of undertaking. I don't have the FTEs right off the top of my head, but it would be substantial.

MEMBER VELSHI: Yeah, it's just good to get a sense of the level of effort. Thank you.

THE PRESIDENT: Dr. Demeter...?

MEMBER DEMETER: Thank you. I'll change gears a bit here.

The base for my question is on page 29 of staff's CMD -- CNSC CMD -- but I will direct the question to Pickering. And it's to do with the management safety control area and organization.

So in 2012 OPG did this business transformation initiative and it centralized a number of services across nuclear, hydro and thermal, and that included training, environmental management, information, management items, service management, et cetera. This is not unique to this industry. It has happened in a lot of other industries. They centralized a sort of shared service model.

One of the things it does is it pulls out some of that on the ground expertise. Rather than someone going down the hall and talking, you've got to call a number and get a ticket and have someone else call you.

I'm not sure it works in your shared

services, but I was wondering with this transition to a more centralized service across three sectors, nuclear, hydro and thermal, are there any risks to losing some of the content-specific issues from an HR point of view, relative to fatigue and the drug and alcohol coming down the road. Because they might be applied differently to the employees in the three different services and you've got sort of one HR that's trying to deal with a broader side of employees, so risks and benefits of this sort of centralization of your HR services?

MR. MANLEY: Robin Manley, for the record.

So if I understand your question, you are looking for an answer to the specific issue around centralization of the human resources function and its --

MEMBER DEMETER: It's HR and training and environment management.

MR. MANLEY: Okay, all of them.

MEMBER DEMETER: That sort of takes it out of your shop and puts it into a bigger shop that now has to deal with a broader audience.

MR. MANLEY: Okay.

MEMBER DEMETER: So how do you make sure that you still get your needs met?

MR. MANLEY: Right, okay. So first off, when the business transformation of sort of centralization

of certain functions happened, we did go through a systematic and rigorous change management plan that, you know, was aware of that risk, right.

So if I could pick on environment, for example, as one of the functions that was centralized, we have maintained a very strong link into nuclear from the environment function.

So we have a Director of a Nuclear Operations Environment. He is here with us today, Raphael McCalla, and he is embedded within the nuclear organization. He is not off at head office somewhere where you can't get him at the end of a phone. In fact, he's in the same building with me. He's in the same building with Glenn Jager, Nuclear Engineering and the rest of our team, and he has resources that are available.

Training -- you know, the Vice President of Training has been off and at our nuclear executive committee meeting and we have training staff, particularly in nuclear certification training, who are 100 percent focused and dedicated around training of nuclear. Training in radiation protection, these people are embedded in our plants and in our nuclear training facilities. So they aren't at arms-length and, you know, losing contact.

In terms of human resources, if I could pick another one, we have human resources business partners

and a Vice President of Human Resources Nuclear who is part of the nuclear team and nuclear executive committee.

All of the centralized management functions or programs that support the nuclear organization whether it's environment, supply chain, training, human resources, they all report on their performance to the nuclear executive committee and the Chief Nuclear Officer Glenn Jager, through our fleet view reporting system. So they are required to come out and report, at least on an annual basis and more frequently if there are any kind of issues as to the performance of their programs, any kind of gaps, deficiencies or what have you.

And when CNSC staff perform inspections of those functions they're reporting their results of any findings that they have to our site vice presidents, like Mr. Lockwood. So they can't -- they are not away, and they can't be away. They are part of us. They are integrated into all of the work that we do.

MEMBER DEMETER: From staff's point of view, as is tradition, made it better, worse, the same?

MR. FRAPPIER: Gerry Frappier, for the record.

I would ask Pierre Lahaie to come and give some additional information.

But as Mr. Manley said at the very end,

from our perspective how they organize themselves is certainly of interest but it still remains that they have a licence. The licence is for the Pickering site. The licence requires them to have security. It requires them to have environmental, different things like that, and we will do our reviews and our audits and our performance based on that.

The fact that, just because Scott is here, you know, the security function is central led does not change the fact that we expect the site to meet the licence requirements. How they choose to organize to do that is a different thing.

But perhaps Mr. Lahaie can talk about our evaluation of the organizational transition.

MR. LAHAIE: Pierre Lahaie, for the record. I am the Director of the Management System Division.

I just want to point out that at the get-go when OPG announced they were going to go to this BTI, they involved staff in our human organizational performance division and in our division in management systems, and we basically walked through it with them, asked all the -- you know, stupid, inane questions to get the good answers and we were -- it was kind of a surveillance for us to see how they were approaching this.

At the end of the day, our biggest concern was whether the accountability for all of those cross-functional programs resided within nuclear. We had lots of discussions with OPG on this, and at the end of the day we were satisfied that they had the points of contact within nuclear that were accountable for those programs, as well as accountability of the corporate program owners to the CNO, as Mr. Manley just highlighted a minute ago, when they do the fleet view review process.

We also followed up recently with a Type II inspection on organizational roles and responsibilities, and we came out with the understanding that as far as organizational change goes, and structure of the organization, it's in line with our regulatory requirements and our compliance verification criteria, and it's aligned with all of the discussions we had over the last few years.

MEMBER DEMETER: Thank you very much.

THE PRESIDENT: Thank you.

Mr. Berube.

MEMBER BERUBE: I have something a little easier probably for you to answer. I'm looking at post-Fukushima activity, especially the upgrades that you've done since lessons learned have come out on that, specifically the EME equipment that's now in the field.

The questions are basically: how often do you spin that equipment up; how often do you exercise the people that are actually using that equipment; what are the chief lessons learned in that; do you actually score that activity; and, how do you use all that knowledge to basically improve your performance overall in this area?

Staff, if you could also comment on the performance evaluations from Exercise Unified Control over what you've seen in the field, and how you feel about that?

MR. GREGORIS: Steve Gregoris, for the record.

As far as practising the use of emergency-mitigating equipment, we did have a multi-unit exercise that was performed in 2015, which had staff deploy that equipment and exercise the use of it. Again, we practised that in 2017 with Exercise Unified Control.

We also have training. The training is done on a fixed cycle, and that's set. It's a five-year training cycle, and in that cycle there is training, practical training, on using the emergency-mitigating equipment. That was done between 2015 and 2017 as well. Initial qualifications to use that equipment does use a practical evaluation, which is scored. You need to meet the minimum score to get that qualification.

MR. BURNS: Scott Burns, for the record.

You wanted some information about Exercise Unified Control as well, and the results of that.

Overall, we've been very pleased with the results of the exercise. It was a year of planning with all of the organizations involved.

In terms of the evaluation, there's really three levels of evaluation, our own internal evaluation, the evaluation by the CNSC, and we're just waiting on the finalization of a report from International Safety Research, who did some coordination for us in terms of the off-site partners. We're just waiting for some results on that.

The purpose of the exercise, as you know, was to validate our program effectiveness. We have received feedback from the CNSC that we did successfully achieve that.

The other aspect of this is obviously learning and strengthening our program, and we've identified some key areas for us to look at and improve in. We saw, not unexpectedly, communication with all of those organizations, and all of the people involved inside our organization. Communication is a key learning. Interesting for us, we had a focus group specifically looking at social media. We had a simulated social media cell that IIR put together. We've learned a lot of lessons

from that in terms of corporate communication and communicating with the public, and utilizing social media, and the sort of higher-level expectations around that. That was really some interesting learning for us that we'll be certainly taking forward.

In terms of some of the success highlights, we spoke earlier about the Unified RASCAL Interface Dose Projection Software, so we implemented that in 2017, and trained our people. That was used successfully in the exercise, as well as the plant information emergency management summary page real-time event status of what was happening, and that information going to the CNSC in real time.

We heard earlier about our new radio system, our P25 radio system for security and fire. That was successfully tested in the interoperability between our ERT, emergency response team, and Pickering Fire Services, who responded and went to a common interoperable channel, and that was successful.

I also want to mention that more recently we had an exercise in security at Pickering utilizing the same system. Again, the success of that system was very positive for us.

So we did have a good exercise, and we have some good lessons learned to apply to our program and

strengthen our program going forward.

THE PRESIDENT: Something for both. Why are some of what I thought was post-Fukushima, make-up water, fire water, some of the ventilation, was bumped to the IIP. Why wasn't it already done? Why has it not been done by now? What am I missing? I thought that there was a lot of work that still got pushed to the IIP, where I expected it to had already been done by now.

Maybe we'll start with the CNSC. Was that not kind of a requirement?

MR. FRAPPIER: Gerry Frappier, for the record.

I think that certainly all the Fukushima action items, as you're suggesting, were done, and in fact were done. There are connections for the water. All that are done.

I'll ask Dr. Al Omar to give us more things.

There are additional things that we're now looking -- given that we have an IIP, given that they're going to be operating a little bit longer, we are looking at some additional potential for improvements. Some of those are yet to be implemented, and they will be implemented over the next couple of years, under the action of Dr. Viktorov.

DR. VIKTOROV: Alex Viktorov.

Just to maybe repeat the same message, it's done. The Fukushima action plan is completed for Pickering. That's categorically done.

THE PRESIDENT: I can't remember, but in both submissions, I thought make-up water to the core was the number one priority to deal with a doomsday scenario, and I'm reading here that's it not done as yet, so somebody correct me.

DR. VIKTOROV: The original plan provided make-up connections according to the Fukushima plan. However, OPG, and we challenged them to do so, continue working to either add additional make-up connections or strengthen and simplify the earlier-provided connections, so it's building up on already accomplished actions.

MR. GREGORIS: Steve Gregoris, for the record.

Just to summarize, President Binder, all the Fukushima action items are completed. All of the required water connections that were required as part of the Fukushima action items are complete and were completed some time ago.

The additional actions for water connection are enhancements to further improve safety. They were developed as part of the PSR process, and they

will improve the total site risk. That's the additional actions that are outstanding.

MR. FRAPPIER: Gerry Frappier, for the record.

Perhaps I could ask Al Omar to add a couple of points on that.

THE PRESIDENT: Let me read you just a couple of sentences. Okay?

"However, emergency fire water cooling piping connection to Pickering Unit 1 will be completed during a planned 2020 outage, and the restoration of emergency power to one main volume vacuum pump will be completed by June 2019."

And I just picked up something on this:

"Completion of necessary power and support service connections required to restore the functionality of a main volume vacuum pump."

I mean there's a whole to-do list. Why are these not Fukushima kind of -- I take the point that you can always find some improvements, but I thought all of these were Fukushima requirements.

MR. FRAPPIER: Gerry Frappier, for the

record.

I'll ask Al Omar to give a little bit more detail on this, but all the things that were required for Fukushima, to provide the water and all that stuff, have been done.

During the PSR process, of course we're looking at additional things that can be done, so that's part of what you're reading there, that were not required as part of the Fukushima actions but are increasing the safety of the plant.

Perhaps Dr. Omar can give us some details.

DR. OMAR: Al Omar, for the record.

As per my previous answer to the reassessment of the Fukushima action items, it was added to the PSR, because the Fukushima action items were okay to 2020, now they are operating to 2024, so we opened again the reassessment of Fukushima action items. That was done in, I think, March 2017, so it has been an issue continuing for discussion during that reassessment.

By default, the Fukushima action items Phase I and Phase II have been in progress by OPG, and as OPG indicated, all actions related to Phase I and Phase II have been completed by end of March 2018, so during the PSR we discovered that some issues remained to be completed, only two actions, because we can't provide an additional

source of water from the fire water. Therefore, this new source of water has to be connected to Unit 1 and Unit 4, and we need an outage to do that. That's the reason one of the actions will be completed in 2020.

Regarding the other one, OPG did a study in 2014 for the controlled venting system, and they have determined that the value added, the safety value added for an external venting system like that for Lepreau, is not huge because they have existing systems they can use for the same purpose, so during that study and the reassessment we said, "Okay, what options do you have?" In discussing the options with OPG, we found that using the FADS -- the filter air discharge system, can be utilized. We went to a site visit and we inspected that option and we found, while discussing the options with OPG, that another system can be added, another option can be added to ensure that when we release, the release will be controlled and filtered venting. That other option requires the provision of power to one of the main volume vacuum pumps, which required another upgraded component that would be added to Phase II of the Fukushima action items. That component, I believe, OPG has already purchased and it's on-site. The only thing left for that is to have the design, the implementation, and the execution to ensure the power is connected to the pump, and then the provision to make it functional doesn't

impact any other component that may be influenced by the provision of that source, so it's only two actions left.

THE PRESIDENT: I assume you will report the progress in the annual report on some of those things as you go along.

MR. FRAPPIER: Gerry Frappier, for the record.

Yes, we'll be reporting annually on the implementation of the IIP items.

THE PRESIDENT: Thank you.

MR. FRAPPIER: Go ahead, Steve.

MR. GREGORIS: Steve Gregoris, for the record.

President Binder, it's important that we go through this systematically so we understand what's been completed and what hasn't, and where that lies. So EME Phase I, that's providing water to the heat transport systems, the calandria vessels, and the steam generators. That is available on every unit at Pickering.

It also provides power for monitoring purposes, and that's available on every unit at Pickering, and that's been in place for several years now.

Emergency mitigating equipment Phase II is a larger power, and that is now available at Pickering as well.

A filtered air discharge system is available at Pickering right now. It's available in manual mode with no power, and it's available to support filtered and controlled venting for multi-unit events.

The EME Phase II provides power to that system, so there's additional diverse ways to use the filtered air discharge system with power beyond the manual capabilities so that there's multiple ways to use FADS for controlled filtered venting in a beyond design basis accident.

The additional modifications we're now talking about for Pickering 1 and 4 is to add fire water again, and similar to EME Phase I, to Units 1 and 4 heat transport systems, calandrias, and steam generators. It's an additional way, another diverse way, to add water. What it does is it proactively looks at preventing an accident from moving to a severe accident, and if it does move to a severe accident, it mitigates the consequences because it's timely, it's a timely modification to add water. That's why we're making that modification, and it's part of our IIP enhancements to safety.

The improvements to the main volume pumps, which were discussed, the power is available to those pumps now. We need the support systems, mainly water for cooling of those pumps. We'll have that in place this year.

That's to provide an additional diverse flow path on top of the current three different ways to do filtered venting via FADS so that there's multiple ways to use filtered air discharge systems in the unlikely event of a beyond design basis accident.

THE PRESIDENT: Just for clarity, if you look at staff's document, page 45, you explained everything to me as a delta on an existing set of improvements you already implemented, but you'll see at the top of the page, page 45, there's one, two, three, they don't look like a delta, they look like a major improvement here, so there may be a clarification kind of thing that you may want to do for part two, that's what I would say, because when I read that, that looked to me like a lot of work that should have been done that has not been done. I take your point, we don't have to debate it now, but I think you'll want to clarify what staff are saying here.

MR. FRAPPIER: Gerry Frappier, for the record.

Just to be clear, from staff's perspective, we would agree with what was just mentioned, as these are add-ons. We view this as additional work that's going to be done under the IIP. Having said that, it probably could have been clearer in the CMD that these are on top of the Fukushima action items that had occurred

a couple of years ago.

I'd also, if you'll provide me with one moment, come back to Mrs. Velshi's discussion around the PSR for waste facilities. I do now have the point here that we tend to look at the OSART as being here's the actions we've agreed to do, here are our recommendations, but there's actually another layer of items that the IAEA provide, and those are called suggestions. There was a suggestion that the plant should consider initiating PSR for the Pickering waste management facility and western waste management facility. As Mr. Jammal indicated, we are not looking at making that a requirement at this time, so we do not expect to do any actions on that.

THE PRESIDENT: Okay.

Ms Penney.

MEMBER PENNEY: I have a groundwater question, I think for OPG first, and then a follow up from CNSC staff.

When I look at page 84 of the OPG document, and then I look at page 38 of the CNSC EA, I'll give you what I think is my summary, and then I have two questions. It's that below the turbine auxiliary bay there are two sumps or sumps, there are sumps. They actually are creating a hydraulic sink and they're affecting the groundwater in the area under that facility. I think when

I looked at the ERA, I may have seen that there as well.

My question is also about there's tritium -- I don't think there's tritium in this location, but there's tritium in some groundwater samples on-site. I do understand that it's not -- the samples that you've taken at the fence line indicate that you're not exceeding anything beyond the fence line, I think I'll say that, so I had a question about how we could have a leak below this tab. Is there no liner? Was there an expectation about a liner or it didn't need a liner? This sump that's being operated and affecting the groundwater flow on-site, is it going to be turned off when we get to end of operations, and does that mean anything with respect to the tritium on-site after the end of operations?

Perhaps OPG first, and then CNSC.

MR. GREGORIS: Steve Gregoris, for the record.

I will ask Raphael McCalla to give some additional details, but I'll start with the groundwater monitoring program at Pickering.

We have a well-established program. There's over 140 wells on the site, including a set of perimeter wells, as you mentioned. The program is there to do a couple of things, to look at groundwater flow, and the preference of flow. It looks at quality, and specifically

any changes in quality that may indicate a pathway from the station. It also looks at is there any off-site effects.

As you mentioned, the system is very sensitive. We've had cases where we've seen quality change and we've initiated investigations, and we've determined pathways and corrected those.

The flow, based on our monitoring, is preferentially north, away from the lake, and to the foundation drains that you're talking about. Those foundation drains then go to a sump that's a monitored pathway out of the plant, so we know exactly what goes out and we can control that. Okay?

As far as if we go beyond commercial operation and to shut down, those sumps and those monitored pathways will remain in service. That's part of our environmental monitoring program, and they'll remain in service as we go forward into the stabilization activities, and beyond.

MR. FRAPPIER: Gerry Frappier, for the record.

I'd ask Andrew McAllister to discuss about the EA associated with the groundwater.

MR. McALLISTER: Andrew McAllister, Director of the Environmental Risk Assessment Division.

OPG touched on a number of the points that

there is environmental monitoring in place, including groundwater. OPG is also transitioning. There's a CSA standard now on groundwater monitoring, 288.7, so they'll be transitioning to that. The expectation is that any changes to operations, if there are changes that could have a bearing on groundwater, then the monitoring program will be adjusted accordingly.

But, as you pointed out, the tritium readings in the groundwater at the perimeter are below, for example, the drinking water guideline of 7,000 becquerels per litre, acknowledging that groundwater on site is not used for drinking water purposes.

MEMBER PENNEY: A question for CNSC staff. So, would you expect that there would be a continuation of groundwater monitoring after end of operations?

MR. McALLISTER: Andrew McAllister, for the record. Yes.

MS PENNEY: Thank you.

THE PRESIDENT: Thank you.

Dr. Lacroix...?

MEMBER LACROIX: No.

THE PRESIDENT: Ms Velshi...?

MEMBER VELSHI: Thank you.

A question for OPG. So, after the fuel channels, what are the key challenges or life limiting

components or structures, and we've heard very little about your fuelling machines where we have talked about them in the past and issues about your limit of liability associated with them, but from a safety perspective primarily, what do you see as the big challenges for the next I guess six years?

MR. LOCKWOOD: Randy Lockwood, for the record.

I'm going to ask Jason Wight to talk about our aging management program, I think that's a good place to start and then see where that goes.

Specifically, we can go back to fuel handling if that's where it takes us, but let's look at the overall aging management -- MAAP program for a start and go from there and that will probably lead into life cycle management plans which I talked about earlier for major components, boilers, feeders, fuel channels.

Jason...?

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

I guess before I start I'd like to just, you know, kind of give you some context. Pickering's been around for a while and we're considered old by years, but we've got a lot of refurbished components in our systems, we're like a brand new Vet in a lot of ways, so we're not

quite as old as we make out to be.

So, with regards to aging management, we have what we call an integrated aging management program and we talked a bit about life cycle management plans and LCMPs on major components, boilers, fuel channels, calandria, vessels, et cetera.

We also have CCAs, compliant condition assessments, we have an obsolescence management process, a very multi-disciplinary encompassing program that we use to monitor for aging, as well as a periodic inspection program as per our operating licence.

Just for example, we talked a bit about the work required for the PSR and the PSR -- even just going through the PSR, it's an aging management -- a way that we manage our components. And we looked at over a half a million components for fitness-for-service, relief valve programs, pump programs, pressure boundary.

We took a look very specifically at our component condition assessments and prepared over a thousand component condition assessments. And that's all part of an all-encompassing aging management process.

With obsolescence, we have an obsolescence management program, always looking at the age of our equipment and what we're required to replace, monitor, refurbish, et cetera.

And I talked a bit about the actual -- I talked a bit about innovation advanced technologies. I'm pretty passionate about, probably could take the rest of the evening.

But very specifically, we're using advanced technologies and as what we can do to monitor and manage our equipment as we go and as we operate and to ensure that we have reliable equipment and safe equipment.

We talked also a little bit about the IAEA and the OSART Mission. They took a look at our aging management process and they were quite pleased with what they saw. In fact, a lot of the refurbishment and a lot of the investment in the power plant has been paying dividends and very clearly they wanted to recognize us for that.

With regards to, you talked a bit about, you know, what would worry us with regards to aging management. Obviously, we've got a program for everything. And when it comes to actually the asset itself, it's really the major components that's the issue.

Fueling machines is more of a reliability and we've got plans with reliability and operating with our fueling machines.

But boilers, for example, would be something that we're inspecting and monitoring, we have life cycle management plans for our boilers. Those are

probably the major issues with regards to aging, it would be the big components, the big pumps, the big turbines, for example, an item that would cost a lot of money to repair and replace.

From a safety standpoint, there are no issues. From a safety standpoint, we are on top of, we manage, we have programs in place, we're using advanced technology as much as we can, using from industry OPEX, et cetera. So, really it's the investment compared to the larger components, but we are monitoring.

MEMBER VELSHI: Thank you. Again, very reassuring.

Staff, anything else you want to add?

MR. FRAPPIER: Gerry Frappier, for the record.

We're very happy with the requirements that the CNSC have put in place with respect to aging management. I think they're considered world standard.

We believe that -- or we are sure that Pickering is fully compliant with those aging management requirements, in particular life cycle management plans for all the major components. So, those are reported to us annually in quite detail.

We're concerned, obviously, just about nuclear safety in the context of the major components. We

are confident that they will have inspection programs and surveillance programs that will ensure that there's nothing that's going to be safety significant that gets through. Long before it becomes that, it will become an operational cost problem and they'll have to deal with them.

But, so at this stage, we don't see anything that we would consider a major safety concern.

THE PRESIDENT: Thank you.

Dr. Demeter...?

MEMBER DEMETER: I don't have a final question, but I just have a final comment.

Just to say that I really appreciate the quality of the reports that have come out in the presentations and a special mention for the OPG report, I really like the little explanatory boxes that help describe some of the terms and definitions of what some of the acronyms meant. So, that was very helpful, I think, to help someone who's reading this navigate what all this language and in and outs. I like those explanatory boxes. That's one thing I know that was quite well taken.

So, I don't have any other questions though.

THE PRESIDENT: Thank you.

Mr. Berube...?

MEMBER BERUBE: Just one other question.

It's not really related to the licence itself, but since you've offered the timeline on page 42 of your document, I'm just curious as to what the management decision is to maintain a safe storage state of what, 22 years, according to this timeline? Of course, that could be done sooner. So, is there a reason for the prolonged safe storage timeline?

MR. LOCKWOOD: Randy Lockwood, for the record.

Yes. Specifically, you're asking about the overall until we start dismantling and demolition; correct?

I'll ask Art to speak to that in a few minutes and perhaps Robin might want to add a few comments here.

But at this time, based on benchmarking and looking at around the industry, we've determined that the deferred decommissioning approach is the best way to go.

Overall, we've come to that conclusion for several reasons, but most notably for this audience would be, we think that's the lesser -- sorry, I should say, it would result in lesser impact to the public and to the worker in terms of overall dose that we allow the plant to decay before we start to disassemble it.

Art, is there something else you would like to add?

MR. ROB: Art Rob, for the record.

Yes. Just building on what Randy said, there is certainly a correlation to worker dose with, of course, the deferred strategy. So, employing this particular strategy does allow us to minimize the potential for -- or the opportunity maybe for dose reduction to workers and ease in dismantling.

Other considerations, of course, is that we still actually have fuel base to this plant for a number of years post-shutdown until about 2037 as the fuel has to have time to age in the fuel base before it can be taken to dry storage. So, there is going to be some requirements to maintain certain systems in the building anyway. So, there's less opportunities to actually start demolishing large parts of this plant until some of those other issues -- secondary issues are dealt with.

THE PRESIDENT: Thank you.

Ms Penney...?

MEMBER PENNEY: This question is around the EA, again, and the OPG ERA. So, on page 43 of the CNSC EA it talks about Frenchman's Bay and sediment sampling and contamination as elevated COPCs in sediment samples.

And in both here and in an OPG document it

makes the -- states that:

"It should be noted that many of the COPCs identified in sediment samples from Frenchman's Bay were not related to the Pickering site, but due to urban stormwater runoff." (As read)

Now, I know that there's an appendix in the ERA that explains this technically, but I'd like to have someone from OPG to explain it to me.

MR. GREGORIS: Steve Gregoris, for the record.

I'm going to ask Jane Borrromeo to explain details to yourself.

MS BORRROMEO: Jane Borrromeo, Section Manager, Environmental Projects.

Yes. So, Frenchman's Bay is the bay that's located to the west of the Pickering site. It has a wetland, it's an enclosed bay with a barrier beach and an opening to the lake, so there is an exchanger plate.

So, within the ERA we do indicate sort of the per cent contribution from the Pickering site. We calculated that value and that value is based on depending on the contaminant.

So, with or without Pickering's contribution, the risk in that bay does not change because

that bay is highly influenced by urban runoff.

MEMBER PENNEY: And I may have not have asked it right, but how did you make that determination? What's the science behind saying that most of the COPCs that are being exceeded there in sediment are not due to Pickering?

MS BORROMEIO: Jane Borrromeo, for the record.

So for -- so, we sampled both in the outfall of Pickering and we sampled within the bay. We used -- we had a hydrological model which determined the concentration and the contribution to the bay itself.

MEMBER PENNEY: And did you also look at discharges from Pickering?

MS BORROMEIO: Jane Borrromeo, for the record.

Yes. So, we looked at both effluent discharges in terms of the concentrations and measured values within the environment.

MEMBER PENNEY: Okay. Thank you.

THE PRESIDENT: Thank you.

Dr. Lacroix...?

MEMBER LACROIX: That's all right.

THE PRESIDENT: I have a couple of quickies here that I'm trying to understand.

First of all, somebody said there's no enriched uranium, yet in a couple of places I see enriched uranium, solid painted layer on tubes of fission chambers.

Where is this enriched uranium coming from and how is it controlled, who owns it?

MR. GREGORIS: Steve Gregoris, for the record.

So, fission chambers, the way they operate, they use enriched uranium. That is part of our licence to have those components onsite and those fission chambers are there to measure neutron power on the Pickering 1 and 4 reactors, they measure it on the outside of the reactor cores.

THE PRESIDENT: Well, where did it come from? I mean, we are -- if I understand correctly, we do not enrich uranium in this country, so where did this stuff come from? Maybe I'm misunderstanding what this is.

MR. GREGORIS: So, maybe I'll explain. So, these are components. They're actually -- the fission chambers are measuring flux on the outside of the core, so they use enriched uranium as part of the method to measure the flux and they're supplied from our supplier. I can get you that information, but I don't have the information on who supplies that equipment to us.

THE PRESIDENT: So, it's coming from

outside Canada, is that -- somebody can...? I saw someone walking from CNSC trying to help us, or not?

--- Laughter / Rires

MR. FRAPPIER: Gerry Frappier, for the record.

So, I've mentioned this is part of instrumentation that has been purchased and put on the two reactors, but I'd ask Dave Moroz to provide us with some detail.

THE PRESIDENT: It's part of the possession licence -- in your possession licence it's explicitly mentioned. So, what is it?

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

Since I started I might as well finish it. This is not part of the fuel, so let me -- it's Ramzi Jammal for the record -- make it very, very clear that there is no enriched uranium that's being burnt in Canada in CANDU, so it's not uranium.

On the waste management side, there are no processing, again, there is no enriched fuel.

This component you are talking about is, as was mentioned, it's integral to a detector and it's been declared with respect to under the safeguard. So, Dr. Moroz is right next to me, he can give you the gory details

with respect to the inspection and the tracking and safeguarding of such very small quantity. I'm not sure if it's prescribed information, but I'm pretty sure Dave has the amount. So, it is very small quantity of enriched uranium used for the purpose of detection and monitoring in the detector.

DR. MOROZ: I'm sorry, David Moroz, for the record.

I don't have much to add, but these are used -- these fission chambers are used. OPG has them, as was stated, on Units 1 and 4 and the IAEA also uses them in fission chambers in its own detection equipment.

The HEU is in very small quantities and it is part of the equipment itself.

THE PRESIDENT: Okay. Every time you see enriched uranium, trust me, it will raise a question. I think you better come up with a better answer than what -- what is it, how it's controlled, where it's come from.

My other quickie is, on page 147, I actually was happy to see the normalized weighting factors for SCA. Everybody on the same page, 147?

So, I assume it's all add up to one. Somebody tell me why it adds to 1.4. What am I missing here? This is staff -- no?

MR. FRAPPIER: Gerry Frappier, for the

record.

So, yes, those are the normalized weighting factors for the safety control areas that we talked about in the past, but I'm not sure who I'm going to look to to explain if it doesn't quite add up to one and it should, as you say, so...

THE PRESIDENT: Okay. Should it? Am I missing anything? In the past --

MR. FRAPPIER: Let me take that out and come back with a proper answer for you.

THE PRESIDENT: Okay. And my final kind of -- I think we need to hear from Environment Canada about their -- you know, there's so many ministries now overseeing this facility from Ministry of Environment of Ontario and the Fisheries and Oceans and we heard from many other.

I'd like to hear from Environment Canada, were you satisfied with, you know, the thermal impact on the lake, the normal kind of thing that we always ask the same question and with some of the emission and impact on the environment?

MS ALI: Okay. Nardia Ali, Environment and Climate Change Canada, for the record.

And we have a very broad mandate, so we're usually involved in the ecological risk assessments. The

areas that touch our mandate, mainly in the area of water quality, species at risk. Those are sort of the main areas we cover. And water quality and discharge.

So, we reviewed sections of Ontario Power Generation's revised Environmental Risk Assessment Report. We're generally satisfied with the conclusion presented by OPG that the risk is low. However, we did -- there were a few areas where we've asked for more information as to how they arrive at their conclusions.

So, one of these is with respect to the whitefish. So, we've asked for -- okay, we've asked them to comment on the whitefish aspect.

MR. KIM: So as far as -- Duck Kim, for the record.

As for the whitefish, as many of -- or maybe not many of the Commission Members know, our primary concern in Lake Ontario is the thermally sensitive species and we've identified round whitefish as a thermally sensitive species of interest.

And the assessment that was provided by OPG is -- we are satisfied with their general conclusions that impacts on round whitefish is likely low. However, the information request that Ms Ali has -- my colleague has mentioned is in reference to data that was provided for other species that potentially might be impacted by the

thermal plume and that is smallmouth bass and emerald shiner.

And the information that was provided was for a five-year period in terms of exceedances of those species' MWATTs, or maximum weekly average temperature thresholds, but it's not clear whether the -- you know, when they -- if there was a cluster of exceedances in one particular summer that might have some impacts on that particular species, because in the discharge channel, water being warmer, these warm water species are attracted and they congregate and they concentrate in the discharge channel.

And, therefore, if we have a large number of exceedances in one particular year versus spread out, you know, one or two over these five years that was reported. So, we're asking for additional detail, precision in that data.

And we're also asking for additional information on stormwater, stormwater management at the site, the point source of the stormwater.

But at this point we're seeking additional information and we can -- we expect that by Day 2 we'll have the additional information and we'll determine what next steps should be at that point.

MS ALI: One thing I wanted to add is that

the Ontario Ministry of Natural Resources and Forestry actually did a study that showed that the population of an area lake wide rather than local, which makes the level of risk from temperature effects even lower. I just wanted to mention that.

And the other area we've asked for more information is with regard to some of the species at risk that are in the site. Like we agree with OPG's conclusions about the level of risk being low, but we just wanted a little more detail on the analysis that were -- on the analyses that were undertaken to arrive at that conclusion.

Another thing we reviewed is, we had one of our meteorologists review the probabilistic risk assessment for high wind and he was generally happy with the assessment done by OPG.

THE PRESIDENT: So, that would be very -- all of this would be very useful for Day 2 to bring some more information to the table.

MS ALI: Okay.

THE PRESIDENT: Did you want to add something?

MR. McALLISTER: It's Andrew McAllister, Director of Environmental Risk Assessment, just to complement Environment and Climate Change Canada's answer.

Back to the study that Ms Ali was

referring to was round whitefish. It was one that was led by the Ontario Ministry of Natural Resources and Forestry, but I want to acknowledge OPG had a large role in the data collection associated with that because one of the things that we were looking at is, you know, are we looking at isolated populations around these nuclear power plants, because these bluff systems seem to be areas of congregation for this species.

And so, there was work done on both sites and some reference sites which, from a genetics perspective, indicated sort of a metapopulation and its building upon the monitoring notion is that, you know, we're comfortable with the thermal risk assessment done to date where there's no indications of unreasonable risk, is not saying now that we're putting our pens down and stopping.

One thing that we did recommend that OPG did accept was to do two additional years of thermal monitoring. So some of these exceedances that we have noted are things that will be rechecked through the monitoring and that monitoring will in turn feed the update of the environmental risk assessment to continue on that sort of cyclical basis.

THE PRESIDENT: Okay. Thank you.

Ms Velshi...?

MEMBER VELSHI: Thank you.

Also some very quick questions and comments.

So staff Slide 31 on the whole-site probabilistic safety assessment, I just wanted to let you know I really like this slide.

A couple of comments and more points of clarification. One is around terminology and I think we have talked about this before, where OPG uses goals and administrative goals and administrative and its limits and targets and whatever and I just hope that we can get consistency. The very fact that it says it's a goal seems it's something one needs to strive for as opposed to something one needs to be less than. So I like the limits and the administrative limits, but something for consideration because it is confusing.

What I wasn't clear is what to expect for day 2 around this. After staff has completed its review, is the expectation that there will be another bar that will show what the all units, all hazards aggregation will be post-IIP? Is that what we can expect for day 2? Which is kind of what OPG shows, but they show it just per unit I think.

MR. FRAPPIER: Gerry Frappier, for the record.

Right now what you can expect for Part 2 is that we will have had a chance to review a bit more in detail the expectations on Pickering A and how it's coming down, as you say, on the per unit basis, so that's for Slide 30, if you like, and we will be able to confirm that we are comfortable with those or whatever.

With respect to Slide 31, which is the whole-site PSA, we did not have at this time any anticipation of making modifications for Part 2. The methodology that has been used is what it is. They accomplished as required by December and we are still sort of evaluating where we think we should go with all that.

MEMBER VELSHI: And again, it's consistent with our expectations, they are above the administrative limits but they have some improvement plans to try to address that. Thank you. So that was on PSA.

And my last one is an opportunity for OPG to comment on the Licence Conditions Handbook. Any comments or your thoughts on that?

MR. MANLEY: Robin Manley, for the record.

As I understand it, the Licence Conditions Handbook is currently in draft. It's based in significant part on our existing Licence Conditions Handbook which we are satisfied with. And we have been providing to CNSC staff our implementation timelines for the variety of

REGDOCs and CSA standards and the like and the CNSC staff presentation spoke to that. So, you know, with respect to the proposed licence conditions that CNSC staff have recommended, we consider those to be acceptable.

I will just check with my colleague Paulina Herrera to see if she has anything to add.

MS HERRERA: Paulina Herrera, Manager of Pickering Regulatory Affairs, for the record.

So I concur with Robin's statement overall. The LCH as drafted, it is consistent with our current LCH and the discussions that we have had with the CNSC staff as well as our submissions. We are conducting a more detailed line by line review and we are anticipating that to be completed prior to Part 2 hearings.

MEMBER VELSHI: Thank you.

THE PRESIDENT: What I didn't hear from you and I expected to hear, it's clear what the requirements are.

MS HERRERA: Paulina Herrera, for the record. Yes, the requirements are clear.

--- Laughter / Rires

MS HERRERA: As always.

THE PRESIDENT: Okay, that's good. We like clarity.

Dr. Demeter...? Mr. Berube...?

Ms Penney...?

MEMBER PENNEY: A quick question for CNSC staff. So looking at the Environmental Assessment Report Regulatory Oversight, page 13 of 82, it talks about OPG submitted on July 13th, 2017, a set of proposed DRLs, derived limits, and environmental action levels to the CNSC that has to conform to CSA N288 and then OPG is going to submit an implementation plan for the new DRLs and requests the Licence Conditions Handbook be updated accordingly. The question to CNSC staff is what is the timeline for that? Is that really -- if they submitted it in July last year, is it really going to mean a revision after the Licence Handbook, if it's approved, is issued?

MR. FRAPPIER: Gerry Frappier, for the record. I would ask Mike Rinker or Andrew McAllister to respond to that.

MS SAUVÉ: So it's Kiza Sauvé, I am the Director of the Health Science and Environmental Compliance Division. So I will start and I will have my colleague Gaétan Latouche to add in anything.

CNSC has done a review of the submission and provided comments back and so as the review continues we expect it to be implemented at the time that we have put into the presentation. But I might be missing your question. Sorry about that.

MEMBER PENNEY: It says that there's going to be a requirement to revise the Licence Conditions Handbook later. Can it not be done -- will it not be incorporated into the Licence Conditions Handbook if it's issued, if the licence is approved?

MR. MANLEY: Robin Manley, for the record. Perhaps I could help a little bit. I'm not sure if this necessarily addresses your issue.

The licence itself once approved by the Commission is relatively unchanging under normal conditions. However, the Licence Conditions Handbook is deliberately a document which CNSC staff can and do update on a regular basis as things evolve. So there is a great deal of flexibility for staff to add new requirements or new DRLs or what have you as time goes on. So that has been an ongoing practice which we have found to be successful for maintaining current conditions and current compliance verification criteria.

THE PRESIDENT: Go ahead.

MS LOVE-TEDJOUTOMO: Lisa Love, for the record. Just a little bit of clarity on that.

In the LCH currently you see the current DRLs as well as the regulatory documents for those DRLs. We have been reviewing a revised set of DRLs according to REGDOC N288.1, the newer version, which I think I have in

guidance, and it's just a matter of time before we put that in. And we are expecting -- it makes a lot of sense to have it start in January of 2019, so it's just a matter of working out the final questions and dotting the i's and crossing the t's and then we will revise -- at that point we will have an LCH that's issued and we will make a revision to that to put the new DRLs into the LCH.

MS SAUVÉ: Kiza Sauvé, for the record.

I'm just going to add one quick -- what Lisa was saying was it makes a lot of sense. One of the reasons it makes a lot of sense to put at the beginning of the year is that when the reporting of effluent and emission against the DRL, when we give you those graphs, it will show the full year, we won't have a changed DRL halfway through the year, which often causes a lot of confusion. So it really helps to have it come in at the beginning of the year as well.

THE PRESIDENT: Dr. Lacroix...?

Ms Velshi...?

MEMBER VELSHI: No, thank you.

THE PRESIDENT: Dr. Demeter...?

Mr. Berube...?

Okay, so I'm going to do the last one and that's really an important one, Slide 59. And staff, you should know better, you have gone to great lengths to be

very clear about what has changed, what is not changing and you are listing 25 CSA standards, 11 new. I know it says examples, but it begs the question where are the missing three?

MR. VIKTOROV: Well, the answer is very simple, there was not enough space to put all the new standards --

THE PRESIDENT: Wrong answer.

--- Laughter / Rires

THE PRESIDENT: Wrong answer. That's why I'm raising it. Please, it always begs the question, so I suggest you don't do that.

Any real serious question?

Okay, I thank you very much, thank you for your patience and we will see you in Part 2, I assume.

--- Whereupon the hearing concluded at 6:22 p.m. /

L'audience se termine à 18 h 22