

**Canadian Nuclear  
Safety Commission**

**Commission canadienne de  
sûreté nucléaire**

**Public hearing**

**Audience publique**

**May 29<sup>th</sup>, 2013**

**Le 29 mai 2013**

Pickering Recreation Complex  
1867 Valley Farm Road,  
Pickering, Ontario

Pickering Recreation Complex  
1867 Valley Farm Road  
Pickering (Ontario)

**Commission Members present**

**Commissaires présents**

Dr. Michael Binder  
Dr. Moyra McDill  
Mr. Dan Tolgyesi  
Ms. Rumina Velshi  
Dr. Ronald Barriault  
Mr. André Harvey

M. Michael Binder  
Mme Moyra McDill  
M. Dan Tolgyesi  
Mme Rumina Velshi  
M. Ronald Barriault  
M. André Harvey

**Secretary:**

**Secrétaire:**

Mr. Marc Leblanc

M. Marc Leblanc

**Senior General Counsel:**

**Avocat général principal :**

Mr. Jacques Lavoie

M. Jacques Lavoie

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Pickering, Ontario

--- Upon commencing at 8:39 a.m.

L'audience débute à 8h39

**OPENING REMARKS**

**MR. LEBLANC:** Good morning, ladies and gentlemen. Bonjour à tous. Welcome to the public hearing of the Canadian Nuclear Safety Commission.

My name is Marc Leblanc and I am the secretary to the Commission.

The Canadian Nuclear Safety Commission is about to start the public hearing on the application -- in fact to resume with Day Two of the public hearing on the application by Ontario Power Generation to renew for a five-year term and to merge the operating licences for the Pickering Nuclear Generating Stations A and B.

During today's business, we have simultaneous translation.

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

Please keep the pace of your speech relatively slow so that the translators have a chance to

keep up.

I'd like to note that this hearing is being video webcasted live and that the hearing is also archived on our Web site for a three-month period after the closure of the hearing.

Les transcriptions seront disponibles sur le site Web de la Commission dans environ 10 jours.

To make the transcripts as meaningful as possible, we would ask everyone to identify themselves before speaking. As a courtesy to others in the room, please silence your cellphones and other electronic devices.

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

Mr. President.

**THE CHAIRMAN:** Thank you, Marc, and good morning everybody.

On behalf of the Commission, I would like to tell you we are delighted to be here, out of Ottawa -- it's still a joke, but it's true -- and to be in the community where we are dealing with an issue of concern to the community.

I would like to thank the community for allowing with this facility and for the people that

facilitate our stay here in the community.

My name is Michael Binder; I'm the President of the Canadian Nuclear Safety Commission.

And welcome to all of you who are joining us via the webcast or through teleconference.

I'm going to introduce the members of the Commission. On my right is Dr. Moyra McDill and monsieur Dan Tolgyesi, and on my left are Ms. Rumina Velshi, Dr. Ronald Barriault and monsieur André Harvey.

We have heard from Marc Leblanc, the Secretary of the Commission, and we also have with us here on the podium, monsieur Jacques Lavoie, Senior General Counsel to the Commission.

So with this information I would like to call for the adoption of the agenda by the Commission Members as outlined in Commission Member Document 13-H11.A.

Do I have concurrence?

For the record, the agenda is adopted.

**13-H11.A**

**Adoption of Agenda**

**THE CHAIRMAN:** Marc?

**MR. LEBLANC:** As indicated earlier, this is

Day Two of the public hearing. The first day of the public hearing or what we refer to as Day One, on this application was held on February 20<sup>th</sup> in Ottawa. The Notice of Public Hearing 2013-H-03 was published on December 19<sup>th</sup>, 2012.

Presentations were made on Day One by the Applicant, Ontario Power Generation, under Commission Member Documents or CMDs 13-H2.1 and 2.1A, and by Commission staff under 13-H2 and 13-H2.A.

OPG and CNSC staff filed supplementary documents on April 15<sup>th</sup>.

The public was invited to participate either by oral presentation or written submission. April 29<sup>th</sup> was the deadline set for filing by intervenors.

The Commission received 136 requests for intervention. One request was received significantly after the deadline and was denied.

May 22<sup>nd</sup> was the deadline for filing of supplementary information. We know that supplementary information and submissions have been filed by CNSC staff, OPG, and several intervenors.

Participant funding was available to intervenors to prepare for and participate in hearing Day Two. The Commission received several requests for funding.

A Funding Review Committee which is independent from the Commission as it is made up of external members not related to the CNSC, rendered its decision on February 11, 2013, and provided funding to five applicants. The decision is available on the CNSC Web site.

All documents are available at the reception either on CDs or in paper format, as well as the Commission Members' biographies.

The way they day will proceed, so we will first hear today the presentations by OPG and CNSC staff, and this will be followed by a joint presentation on emergency management plans.

After that, we will not go through a first round of questions which the Commission Members normally do, and we will go directly to the interventions which is the purpose of us being here in the community.

Commission Members will have the opportunity to ask questions after each presentation.

Sixty-four (64) intervenors are scheduled to present this week. Time allowing at the end of each day, we will be addressing some of the written submissions, and if not, it will be done on Friday afternoon.

We have in attendance or by teleconference



available for questions from the Commission representatives from different departments: Fisheries and Oceans, Environment Canada, Natural Resources Canada, Health Canada, the Durham Emergency Management Office, the Durham Medical Health Office, Emergency Management Ontario, the Ministry of Transportation Ontario, the Ministry of Ontario Health and Long Term Care and the City of Toronto.

Your key contact persons throughout the next three days will be Ms. Louise Levert and Ms. Marie-Claude Valade from the staff. You'll see them at the reception area and they'll be going around or at the back of the room if you need information regarding the timing or any other considerations.

The break for lunch will be from 12:30 to 1:30 today, and there will be short breaks in mid-morning and in the afternoon. We have planned dinner around 6:30 and there will be evening sessions both today and tomorrow.

Mr. President?

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

So before we start the hearing I'd like to share with you some -- a few introductory remarks.

We are here in the City of Pickering for the next three days to consider the written submissions

and oral presentations from a large number of citizens and organizations who wish to express their opinions on the applications by OPG for the renewal of the Pickering NPP operating licence.

I would like to clarify a few things before getting this hearing underway. First of all, I'd like to emphasize that the Commission is a quasi-judicial administrative tribunal and that consequently it is independent from any political government or private sector influence.

In fact, each Commission Member is independent of one another and also independent of the CNSC staff.

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

The Commission Members are appointed by the Governor in Council on the basis of their achievement in their respective fields of endeavour as well as their excellent reputation amongst the peers -- amongst their peers.

The mandate is simple, ensure the use of

nuclear is done in a manner that is protect -- protects of the environment as well as the health, safety and security of the workers and the public.

Several intervenors have raised important questions on the future of nuclear energy in the Province of Ontario. Many are asking why more consideration is not given to wind and solar energy instead of nuclear energy in this hearing.

I trust that you will understand that the Commission, as an administrative tribunal, does not have the statutory authority, and will not consider questions that are of public policy or political in nature. It is the Ontario provincial government that must address these fundamental energy policy questions.

I would also like to emphasize that the CNSC has no economic mandate and will not base its decision on economic -- on the economic impact of the facility.

I will repeat it. It is the health, safety and security of the public and the protection of the environment that guides our decision.

Finally, we are conducting this hearing in Pickering to provide a forum where members of the public can express their views on the matter at hand.

We therefore wish to hear the more than 60

oral presentations and ask as many questions as we deem necessary on these and the written material submitted.

We therefore ask that everyone respect the decorum of the tribunal setting and assist with the orderly conduct of these proceedings.

Thank you for your attention.

**Ontario Power Generation Inc.:**  
**Application to renew the Power**  
**Reactor Operating Licence for the**  
**Pickering Nuclear Generating Station**

**THE CHAIRMAN:** And I would like to now formally start the hearing by calling on the presentation from OPG, as outlined in Commission Member Document 13-H2.1B and H2.1C.

And I understand that Mr. Jager will make the presentation.

Please proceed.

**13-H2.1B / 13-H2.1C**  
**Oral presentation by**  
**Ontario Power Generation Inc.**

**MR. JAGER:** Thank you, Mr. Chairman,

Members of the Commission. Good morning.

For the record, my name is Glenn Jager; I'm the Senior Vice-President of Ontario Power Generation's Pickering Nuclear Generating Station. As a member of this community I would like to welcome the Commission to Pickering on behalf of OPG Pickering.

I have with me today Martin Tulett, Deputy Vice-President; Robin Manley, Manager of Regulatory Affairs; Shane Ryder, the Director of Operations and Maintenance; Carl Daniel, the Director of Station Engineering; and Mark Elliott who is our Chief Nuclear Engineer of OPG.

Other representatives of the OPG team are also here today to assist in responding to your questions.

Pickering Nuclear has been providing safe, clean, reliable and affordable electricity to Ontario grid for more than 40 years, with a total output of 3,100 megawatts, Pickering Nuclear has been powering homes, schools and businesses across Ontario since it began producing power in 1971.

Its reliable low-cost power has helped fuel Ontario's economic growth and it forms part of the backbone of Ontario's electricity supply. Pickering Nuclear also helps form the backbone of the community here in Pickering.

OPG employees at Pickering Nuclear are proud to be part of the local community. We believe in giving back as volunteers and investing in community partnerships that enhance the quality of life for area residents.

For the past 40 years the operations at Pickering Nuclear have positively contributed to the local economy and to homes and businesses across Ontario. Its ongoing operation is an asset to the community and the province.

The current power reactor operating licenses for Pickering A & B expire on June 30<sup>th</sup>, 2013, and we are here today to request one license for the combined Pickering A and B units for a 5-year period to June 30<sup>th</sup>, 2018.

As the site Vice-President of Pickering I am here to re-affirm my commitment to safe operation of the Pickering site and to outline how Pickering's performance has improved and how we will continue this improvement in every area.

In addition, I will address a few issues that were raised at Day One, in the CNSC's Day Two CMD, or by intervenors in their submissions to the Commission.

In this presentation I will tell you about our safety performance, the performance of our plant, our

improvements in environmental protection, and nuclear safety in our fitness for service and aging management programs.

These, along with our excellent emergency preparedness program, our Fukushima response, and our safety culture, are proof that we can safely operate this station to the end of commercial operation in 2020.

I will also outline just some of the major initiatives and investments in the plant that we are taking to support continuous improvement, our commitment to the community and the future plans for continued operation.

Safety is a cornerstone of nuclear operations at OPG. We are proud of our safety record and work very hard to maintain it. Therefore, I am pleased to be able to tell you that since the Day One public hearing we have reached 2 years and over 10 million hours since our last lost time accident. This is a new record for the Pickering station.

Our accident severity rate is zero and compares very favourably with other sectors of the broader Canadian energy industry as documented in the CNSC's annual report. Nonetheless, despite these successes, Pickering's goal is zero injuries.

I've emphasized before how important it is

to us that our employees go home just as safely as they arrive to work. The Commission will hear interventions from the unions representing workers at OPG, how high an importance they place on safety and how workers and their unions contribute to safe plant operations.

Similarly, you will hear from some contractor companies who've worked with OPG. How much they appreciate the high standards of safety at Pickering and why that is one of the reasons they prefer working with OPG. In fact, OPG influences standards in this area.

That is the message we bring to you today and to the intervenors and members of the public. We operate this plant safely for our workers, contractors, the public and the environment and we will continue to do so throughout the upcoming license period and to the end - - end of plant operations. It's our way of life at OPG.

Protection of the environment and the public is an integral part of Pickering's operations. Radiation dose to the public has been only a fraction of the regulatory limits for the entire operating history of the plant and has been reduced to a fraction of 1 percent of the regulatory limits for the last license period.

Evidence of Pickering's environmental stewardship is also shown by our emissions which have been well below regulatory limits for many years and have been



reduced even further over the license period.

We have achieved a 24 percent reduction in airborne charting emissions over the license period through improvements in equipment performance and leak mitigation efforts, and we are constantly working to reduce emissions through improvements in equipment reliability and human performance.

There have been zero consequential spills during the licensing period. Pickering tracks and trends all spills, regardless of consequence, in order to ensure that we may address any precursor events through our corrective action program.

Our leadership in environmental stewardship has been recognized by numerous organizations, such as those were discussed in Day One.

Pickering exceeded the CNSC targets for 80 percent reduction in fish impingement and met the intent of 60 percent reduction in entrainment through the use of a fish diversion system and other offsets.

As seen on the graph, OPG has met the impingement target for the last three years and improved performance over the period the net has been in service. OPG will continue to monitor and demonstrate long-term compliance to these targets.

Earlier this year, OPG informed the CNSC

that it would pursue offsets to compensate for the impingement of northern pike which occurs over the winter period when the net is not deployed.

OPG is committed to Toronto and Region Conservation Authority to fund the restoration of three hectares of coastal wetlands in the Duffin's Creek. These offsets will continue to provide fish habitat into the future, beyond the operating life of the station.

With respect to thermal emissions, OPG is working with stakeholders to better understand the impact of operation of Pickering and Darlington on the round whitefish.

OPG recently facilitated a workshop with Department of Fisheries and Oceans, Environment Canada, Ministry of Natural Resources, and the CNSC, to define objectives for a round whitefish action plan.

The second workshop is planned for 2013 to develop a methodology for a population study, should the study be required.

Pickering has significantly improved its performance in the area of impacts to fish. We have met and exceeded targets set by the CNSC. We have sought input from, and will continue to involve, stakeholders, including the Métis Nation of Ontario and other intervenors, in our work in managing fish impacts.

Nuclear safety is an overriding priority across the OPG fleet. As part of that effort we continue to update our safety analysis to new standards to demonstrate safe operation of the Pickering plant.

The risk models are used to optimize the configurations of plant due to operations, maintenance and proposed design changes for maximum safety benefit and to prevent any unintended risk.

Since day one we have continued to work on projects to improve safety margins. For example, the passive autocatalytic re-combiners, which are used for hydrogen mitigation, in the event of a severe accident, have been installed on three Pickering units. All will be in place in 2014. Emergency coolant injection strainers have been replaced to provide greater capability in safety margins on all units.

Pickering's objective is to continue to focus on safely achieving high performance and be ready to support Ontario through reliable electricity production during the upcoming Darlington refurbishment.

To meet these objectives Pickering and OPG continue to work closely in benchmark with industry peers to implement the best and most effective practices. We've implemented proactive performance measures and targets consistent with the industry's best practices.

We have a well-established and comprehensive periodic inspection program, regularly updated, that meets stringent CSA and CNSC standards. Inspections of major components are completed to confirm their ongoing fitness for service through the end of life to 2020.

Regarding the black deposits identified on some Unit 1 fuel bundles, visual inspections of discharged fuel bundles from Unit 1 have not shown signs of corrosion or fuel defects.

Changes to the pH of this heat transport system coolant and higher purification rates are expected to reduce the present deposits and preclude the formation of additional deposits.

We will be inspecting many bundles over the next few months from different regions of the core and provide those results to CNSC staff to demonstrate the impact of the improvements we have made. We believe this will enable the return of this unit to full power.

We have an extensive aging management program to ensure we know the condition of our equipment and continue to demonstrate it is safe and fit for continued operation.

The program integrates testing, monitoring, inspection and modifications to ensure that the health of

components and systems are assured as the plant ages. The supporting evidence of the on-going success of the aging management program is that the Pickering Plant has improved in safety and reliability.

Safety system performance is better than target and improving. The number of component failures has decreased and system availability has increased.

A measure of how well the plant runs, called "Force Loss Rate", which is basically the amount of time we're not running when we plan to, is the best ever for the overall Pickering Station.

The aging management program also addresses degradation mechanisms and surveillance. As an example, some intervenors have asked whether we have a concrete degradation issue at the Pickering Plant. The alkali-silica reaction or ASR issue in our industry was well understood at the time of construction of the Pickering Station.

During the construction of our nuclear facilities, we eliminated the reactive forms of silica in our materials. Nonetheless, we have looked for it in our Concrete Containment Monitoring Inspection Program and no ASR activity has been observed.

Regular reactor building pressure tests are performed confirming the structural integrity of

containment. In fact, the latest reactor building pressure test performed on Unit 5 has resulted in improved performance.

As well, the vacuum building was tested during the last outage and the results were better than the previous test results because of the actions taken to manage aging. That demonstrates that, by continued investment and maintenance of our plant, we can keep getting better.

I have very high confidence in our fuel channels, are reliable and safe to operate until 2020. Two hundred and ten thousand (210,000) equivalent full power hours was the assumed design life input used when the plant was constructed. Frankly, we know a lot more than we did then.

The measure rate of wear actually turns out to be less than that assumed in the original design. The Canadian Standard Association Fitness for Service Assessment Process is used to demonstrate safe operation. This rigorous process will continue to the end of the target service life at 247,000 hours.

The work that we have undertaken includes: extensive industry research has been performed on the pressure tubes over many years. Inspections are regularly performed in situ non destructive examination every

maintenance outage as well as laboratory destructive testing of pressure tubes removed from a reactor every four years.

Both of these have lead to specific actions to improve pressure tube life. A unique design feature of CANDU reactors allows early detection of any pressure tube leak. This design is very sensitive and has been further enhanced to improve detection capability. In the event that a leak were to develop, we have the capability to quickly detect it and proceed to safe shut-down.

Assessments demonstrate that the fuel channels are fit for service to the continued operations period of 247,000 hours and this will be reconfirmed via scheduled in-service inspections and assessments on an ongoing basis.

We understand and will comply with the hold-point licence condition established by the CNSC and with the criteria we must successfully satisfy before we can go past 210,000 hours.

It is for these reasons we are confident pressure tube life can be safely extended.

Plant safety cannot be assured using a single measure or tool. The unique nature of our industry requires us to look at safety through multiple lenses. Each of our various tools used for ensuring safety

provides us with unique insight into the plant safety strengths and vulnerabilities.

Some examples of these tools include: a safety analysis -- this would be in our Safety Report; component and system inspections and testing; safety assessments; and robust programmes like our Aging Management Programme and Probabilistic Risk Assessments, or "PRA" for short.

With respect to PRA, the unique insight it offers is that it identifies potential accident sequences that contribute to plant risk and quantifies improvement opportunities whether they be physical design changes, alignment of systems and components or administrative changes.

PRA methodology in the industry has evolved over time and OPG has been reassessing plant safety using the industry's best practices.

For Pickering Units 5 to 8, the 2007 PRA was updated last year in 2012 and Pickering 1 to 4 2009 PRA update is currently underway. Major elements of the project will be completed in 2013 and the balance will be completed by mid-2014.

The results provided by the PRA are compared against OPG's safety goal targets and safety goal limits. A summary of the results is available on the OPG



Web site.

In developing our safety goals, OPG benchmarked against other countries. In comparison, OPG safety goals for existing plants which are very challenging are either the same or more restrictive than the safety goals set by most other nuclear jurisdictions.

For all hazards assessed in our PRA, the severe core damage frequency and large release frequency, satisfies OPG's safety goal limits. OPG will always ensure that our plants operate to meet the safety goal limit.

For example, when the 1995 Pickering A PRA estimated a result that was higher than OPG's safety goal limit, significant plant design changes were implemented during an extended outage to achieve our safety goal limits.

In the area of emergency preparedness, Pickering is required by our operating licence to implement and maintain an Emergency Preparedness Programme which addresses both on-site and off-site effects.

The key elements of this requirement include: assisting off-site authorities in planning and preparing for a release; notifying off-site authorities when an accident or a release occurs; reporting emergency information to off-site authorities during and after an

accident; assisting off-site authorities with the effects of an accident and testing of the emergency plans established to prevent or mitigate an accident.

I can tell you with confidence that the Pickering site is in full compliance with this licence requirement and that we have a robust Emergency Preparedness Programme in place. CNSC staff regularly conduct inspections on our EP Programme and its implementation and have rated it as "satisfactory".

Our Nuclear Emergency Plan and Emergency Procedures are well integrated with the regional and provincial nuclear emergency plans. Our emergency response teams conduct joint training with municipal emergency services and are exercised on a regular basis.

Our Nuclear Emergency Plan and Emergency Procedures address single-unit or multi-unit events including design-basis accidents and larger beyond-design-basis accidents.

We have used beyond design-basis accidents to validate our plan during exercise with the Province and Durham Region to ensure that all stakeholders have the capability to respond to that kind of scenario.

Representatives from OPG, Emergency Management Ontario and the Durham Emergency Management Office will provide the Commission with additional details

on our integrated emergency plans later this morning.

The OPG team has been in front of the Commission many times before to speak of our work and response to the Fukushima Daiichi event.

We have confirmed that the Pickering Nuclear site is an area of low seismic activity, not on a fault line and plant structures and systems are seismically robust.

All Fukushima action items are being completed on schedule. This includes, as shown on the slide, providing on-site additional equipment that can independently supply power and cooling even if all other redundant back-ups have failed.

Emergency response capability has been expanded to include events outside of design-basis accidents; responders practice drills for equipment deployment and to rehearse actions. OPG is working with our partners to organize a full-scale unified response exercise involving all the relevant Canadian agencies and some international agencies for May 2014.

As stated before this Commission on several occasions, we continue to monitor the follow-up on Fukushima Daiichi Generating Station and co-operate with other utilities to apply lessons learned and reinforce our response capability.

We can say with confidence that the actions we have taken have resulted in significant reduction in risk in this area beyond the already low levels.

Safety is a part of everything we do at OPG and at Pickering. We take to heart the mantra about operating experience and learning the lesson of others in the industry. Use it or become it.

Safety culture starts at the top and moves down through the organisation. Our leaders understand how their decisions set the tone for how the rest of the organisation behaves. For this reason, the Nuclear Safety Policy is one of only four policies held at the OPG's board of directors level.

The board of directors confirm their expectations are being met through several forums. The Nuclear Oversight Committee is a special subcommittee of the board consisting of industry experts with a primary focus on nuclear safety.

The board also has commissioned a Nuclear Safety Review Board to perform yearly assessments of nuclear safety culture as well as bi-annual international peer reviews of our plant. The results of these assessments are given directly to the board, to which I am accountable for those improvements.

In addition to these assessments, Pickering

management conducts its own safety culture assessments using industry-recognized methodology. We also conduct organisational effectiveness reviews and our own self-assessments. We perform observation and coaching of our own staff, and have a robust corrective action program.

In addition, the nuclear industry has a very strong operating experience program designed to capture a lessons learned, both at Pickering and across the industry. All of these inputs are reviewed on a regular basis by the Nuclear Safety Culture Monitoring Panel and recommendations are made to the senior leadership team to further improve safety culture performance.

Use of a Nuclear Safety Culture Monitoring Panel is a recognized industry best practice and recommended by the Nuclear Energy Institute in their industry guidance document on fostering a strong nuclear safety culture.

All of these components have confirmed the safety culture at Pickering is healthy and undergoes continuous improvement. Moreover, the programs are there to detect any negative trends early and correct behaviours before they become evident in results.

Our safety results prove these programs produce industry-leading performance. Moreover, we will

continue to strive for future improvement.

As previously submitted, OPG has decided not to refurbish the Pickering station and is instead extending the operation of the Pickering 5-8 units approximately five years. This is being accomplished through our continued Operations Plan which follows the requirements laid out by CNSC staff.

The plan also outlines investments we are making to continue to improve Pickering's performance in the next few years. Beyond that, investments in plant, programs and people are documented in our Sustainable Operations Plan, provided by the CNSC staff, which demonstrates how we will safely operate the plant until the end of commercial operation.

This plan will become more detailed as we approach 2020 and, among other things, will address employee concerns about the closure of the Pickering plant.

OPG has already prepared initial plans for decommissioning and for the long-term management of radioactive waste. In the meantime, radioactive waste generated at Pickering is managed safely here and at our waste facility on the Bruce site. Among other things, as an ongoing initiative, we set targets and implement improvements for radioactive waste minimization and

reduction.

At this time, we have selected deferred decommissioning for a variety of reasons, as have many nuclear plant operators around the world. However, we continue to review industry experience in this area to form our future plans. During the next licence period, OPG will be submitting more details on the processes, which will follow the end of electricity production in 2020.

At Ontario Power Generation, we work hard every day to maintain the social licence earned through the trust and support of our host community. We are at work daily in the community sharing information on our operations and the values that underpin everything we do.

We regularly meet with our host community elected representatives, First Nations and Métis groups, community members, organisations, boards and opinion leaders. We host and participate in community events and we partner with dozens of important environmental, educational and community building groups.

Many of the positive interventions you'll hear over the coming three days are a testament to the scope of our work in the community and the importance we place on ongoing dialogue.

As we move toward 2020, our commitment to

information sharing and dialogue will only increase. We will continue to work with the community to better understand our ongoing operations, what the closure of the Pickering station will mean to OPG and the community.

For example, we have recently initiated a project to help us determine potential future commercial uses of the Pickering site, which will include consultation with the community. We have also agreed to fund two studies for the City of Pickering to help them better understand the impacts of the station's eventual retirement on the city.

At OPG, we believe that a good company gives back to the communities in which it operates to help improve the quality of life in those communities for the duration of its operations and beyond. This is a commitment that we take seriously and that we demonstrate every day because we not only work in Pickering, we live here as well.

Pickering's performance remains strong and improving in the area of nuclear and conventional safety, radiological protection and environmental protection, meeting our international obligations and bettering industry and regulatory targets.

Our operating performance has improved over the licence period. I am accountable and you have my



personal commitment to safely and reliably operate the Pickering station. Our results demonstrate that commitment and improvement.

We have robust programs in place to ensure nuclear safety and the safety of our workers, the public, and the environment. We are committed to execute the plans we have in place to ensure the safe and reliable generation of electricity.

In conclusion, Mr. Chairman and Commissioners, OPG's Pickering team remains qualified and competent to safely manage and operate the Pickering Nuclear Generating Station. We will continue to make adequate provision for the protection of the environment, the health and safety of persons, the maintenance of national security and measures required to implement international obligations to which Canada has agreed.

I invite any questions the Commission may have.

**THE CHAIRMAN:** Thank you.

I'd like now to move to the presentation from CNSC staff, as outlined in 13-H2.B.

And I understand that Mr. Jammal will start the presentation or somebody else I guess, who'll identify himself. Please proceed.

**13-H2.B**

**Oral presentation by**

**CSNC staff**

**MR. RZENTKOWSKI:** Good morning, Mr. President and Members of the Commission.

My name is Greg Rzentkowski, I'm the Director General of Power Reactor Regulation. I will be responsible today for delivery of the presentation and also I will coordinate a staff response to any question the Commission may have.

With me today is Mr. Miguel Santini, Director of the Pickering Regulatory Program Division. Regulatory and technical staff from the CNSC are also present and available to answer any question the Commission may have.

This presentation provides an overview and update from Day 1 in relation to Ontario Power Generation's Application for the renewal of the Pickering Power Reactor Operating Licence.

In the presentation, for simplicity, we will refer to the licensee as "OPG" and the Pickering Nuclear Facility as "Pickering".

To begin, here is an outline of our presentation. It includes: Overview and background on

the licensing matter, followed by a strategy to end commercial operation of all units and decommission the site, the program updates committed by CSNC staff and additional information as requested by the Commission during Day 1, as well, the main areas of interest raised by intervenors and conclusions and recommendations.

The current Pickering A and B operating licences expire June 30<sup>th</sup>, 2013. OPG has requested a combined five-year licence for both Pickering A and B as directed by the Commission in 2010.

CNSC staff confirm that all safety and control areas have received performance ratings of satisfactory. CNSC staff have reviewed OPG's licence application and found that it contains sufficient information to demonstrate that it meets all regulatory requirements for a licence to operate.

CNSC staff have also included in the proposed operating licence a regulatory hold point for the reassessment of the safety case, which is required to justify operation beyond the currently analyzed operating life of the Pickering B pressure tubes.

CNSC staff will continue to provide the Commission with updates on the operation and future decommissioning of Pickering. This will be done through the NPP Report, which is presented to the Commission

annually.

This slide provides a timeline for current operations to end of life for Pickering. It includes operation of all the units until 2020 and transition to safe storage from 2020 to 2023; safe storage from 2023 to 2045; dismantling and decommissioning from 2045 to 2055; and finally, site restoration from 2055 to 2060.

Consequently, it is anticipated that in 2017, OPG would apply for another five-year licence renewal of the Pickering operating licence, which would include transitional provisions for safe storage.

At the Day One hearing, information was either requested by the Commission or committed by CNSC staff. This consisted mostly of information related to the licence application and program updates.

When there was much public interest in a specific subject matter, the presentation addresses them under their respective safety and control areas. This is followed by other specific information, namely the Fukushima follow-up and a summary of the 2013 report published by the World Health Organization, and licensing documentation that is before the Commission.

This information is summarized in the table on this slide and discussed in CMD 13-H2.B.

I will now pass the presentation over to

Mr. Santini.

Miguel?

**MR. SANTINI:** Thank you, Dr. Rzentkowski.

CNSC staff committed to provide an update on OPG's move to a centre-led organization, a restructuring currently underway at OPG.

As indicated in CMD 13-H2, OPG is regrouping its resources on transition into a centre-led organization as part of the business transformation initiative. The business transformation plan was initiated in 2012. To date, OPG has demonstrated progress in implementing these changes.

In CMD 13-H2, CNSC staff committed to provide an update on the initial certification examinations, re-qualification testing, and the implementation of a systematic approach to training program for the emergency response organization as well as certified staff. CNSC staff expect an update on the initial certification examinations, corrective actions in 2013.

An inspection was carried out in late 2012 on the re-qualification testing program implementation. The inspection team concluded that the results of the re-qualification test and initial test at Pickering B were acceptable.

Corrective action plans for a SAT-based training for shift managers and control room shift supervisors are being implemented. The remaining issues are being addressed and the corrective actions will be completed in 2014.

The Emergency Response Organization corrective action plan was completed by OPG. CNSC staff review is almost completed, and we are satisfied with improvements implemented to date. CNSC staff are confident that OPG has sufficient number of qualified workers at Pickering to ensure safe operations.

For the record, CNSC staff would like to point out the correction in Supplemental CMD 13.H2.B. The numbers provided in the table on page 3 are accurate. However, the numbers described in the text should match those in the table.

At the Day One hearing, the Commission requested from CNSC staff further information on the black fuel deposits observed on fuel bundles in Unit 1.

The black deposits observed on discharged, the fuel bundles in Unit 1 may have an effect on heat transfer from the fuel to the coolant; Although observations of the fuel most affected bundles show no evidence of effects on heat transfer, it is believed that the deposits are a result of poor chemistry control during

outages.

As indicated in Day One, CNSC staff has imposed a 3 percent derate from full power to ensure that all safety margins are maintained.

The corrective actions carried out by OPG include provisions for heat transport system and purification during outages, increasing filtration rate, and maintaining the pH within a narrow range to redissolve existing deposits, and arrest the formation of new deposits.

Upon request, OPG is now inspecting a larger number of bundles to better map the presence of deposits in the core. So far the inspections in Unit 1 have shown that bundles with larger deposits come from channels of lower power where the safety margins are much larger and the impact to heat transfer are less significant.

CNSC staff will release the 3 percent penalty once OPG has provided sufficient information, including trending of the deposits shown by inspections to give CNSC staff confidence that the safety margins are maintained.

Other risk control measures put in place by staff, such as reporting and monitoring, will also continue.

At the Day One hearing, the Commission requested further information from staff on the probability safety analysis for Pickering. For the record, OPG refers to PSA as Probabilistic Risk Assessment or PRA.

It is important to know that the PSA is one of the multiple elements to assess and ensure that the plants operate safely. The PSA provides a global idea of the probabilities of events or the frequency, and the CNSC staff has many other tools at hand to ensure safe operation.

The Pickering PSA reports are produced and submitted as per licence conditions. During the current licensing period, OPG was required to comply with CNSC regulatory document S-294 entitled "Probabilistic Safety Assessment for Nuclear Power Plants".

The Pickering A PSA is being revised by OPG, as required by the licence. And CNSC staff confirms now that the Pickering B PSA was delivered in time and complies with this S-294.

The Fukushima Action Plan also required OPG to complete supplementary studies specific for beyond design basis accidents.

The table shows the latest Pickering PSA results. The existing PSA results for Pickering A on



internal events show that OPG met the safety goals. It is expected that the revised PSAs due next year, will be a full scope, as required by S-294.

The revised Pickering B PSA includes internal and external events. The aggregated results indicate that the safety goals are met.

In addition, PSA has contributed to improvements of overall safety by identifying plant vulnerabilities. Improvements to address these vulnerabilities have been made as required by the Fukushima Action Plan.

CNSC staff estimate that these improvements have reduced the risk of severe core damage frequency and large release frequency by at least a factor of 10.

The amount of safety improvement depends on the initiating event. For example, a factor 100 improvement is expected in case of total station blackout, but more modest improvements are expected for other postulated scenarios.

New methodologies are being developed to allow more precise quantification of completed and committed safety improvements.

At the Day 1 hearing, the Commission also requested from CNSC staff to provide further information on environmental risk assessment, specifically on the

intake fish impingement and entrainment, as well as thermal plume risk to the Round Whitefish spawning.

Targets to mitigate intake fish mortality have been met by the deployment of barrier nets, fish stocking and wetland habit projects.

Thermal plumerisk to Round Whitefish spawning was offset using indirect measures since there was no direct plume mitigation that was cost effective and feasible.

These measures include: increasing the number of Round Whitefish locally by eliminating lethal sampling of Round Whitefish in the annual radiological fish tissue sampling by using alternative species.

And in the Round Whitefish Population Study with the Ministry of Natural Resources and the Department of Fisheries and Oceans, to verify that Whitefish at Pickering are not isolated but are connected to nearby populations capable of providing migrants to counter any local depletion.

CNSC staff committed in CMD-13-H2 to provide the Commission with an update on the assessment on the electrical distribution system and safe operating envelope program implementation from Day 2.

CNSC staff received the progress report from OPG addressing the majority of the corrective actions

with a proposed timeline for completion of the remaining issue.

The safe operating envelope, SOE, is a comprehensive set of operational limits and conditions defined in CSA standard N294 - 290.15 entitled: "*Requirements for the Safe Operating Envelope for Nuclear Power Plants*" and this is the successor of the operating policies and principles referenced in past licences.

The SOE is required in the new license with provisions for the implementation strategy in the License Conditions Handbook.

In May 2011, a pilot inspection on the implementation of the SOE program was conducted at Pickering and included the emergency service water system to gauge the implementation status.

CNSC staff suggested improvement to the SOE program and OPG is in the process of implementing these recommendations for completion by the end of 2013.

At the Day 1 hearing, the Commission requested information on the frequency of the vacuum building testing and an update on the revision to CSA Standard N287.7 entitled "*In-service Examination and Testing Requirements for Concrete Containment Structures for CANDU Nuclear Power Plants*".

CNSC staff also committed to provide an

update on the Pickering A assessment of balance of plant, namely, on the cracks in the feedwater lines.

The vacuum building outage took place in 2010 and all activities comply with CSA Standard N287.7. The leakage rate was measured to be well within the regulatory limits established in the safety analysis.

OPG has provided clarity on fatigue analysis of the feedwater pipes of the Pickering A boilers. Improvements to the inspection of the piping support were also implemented. CNSC staff are satisfied with the progress on this area.

From the interventions filed, there were many who were interested in Aging Management, especially regarding the continued operation of the pressure tubes. The 210,000 effective full power hours limit for the pressure tubes was determined based on the engineering methodologies available at the time of the design.

The analyzed safety case was set at the time as the assumed design life of the tubes.

The Fuel Channel Life Management Project is a special research initiative founded by OPG, Bruce Power, and AECL to analyze the safety case beyond the initial limit by improving the level of understanding of degradation mechanisms and material behaviour at late-life operating conditions.

The project must demonstrate a new analyzed safety case beyond the current limit to ensure the fitness for service of the pressure tubes.

For aging management of the plant, OPG follows RD-334 entitled "*Aging Management for Nuclear Power Plants*" which requires measures to ensure fitness for service of all plant systems and components.

CNSC staff is confident that OPG is dealing with aging of the plant in a conservative way to ensure that safety margins are maintained.

At the request of the Commission, CNSC staff are providing an update on the public alerting system. After the remaining eleven new sirens were installed, Pickering now meets all of the provincial requirements for fifteen minutes indoor and outdoor notification in the three-kilometre zone.

In regards to the 3 to 10-kilometre zone, public alerting is accomplished through an auto-dialer system as well as through the provincial public warning system that uses media broadcaster, social media and text messaging. A multi-jurisdictional team is currently evaluating enhancements to this system.

At the Day 1 hearing, the Commission also requested clarification and information on the integration of the multi-jurisdictions of the surrounding

municipalities, provincial and federal agencies and our neighbour, the United States.

CMD-13-H2 provides the detailed description of roles and responsibilities of the main players as well as the integration of sequential activities in the first 72 hours of an accident.

Due to the interest expressed by many intervenors on this topic -- especially on planning, response and evacuation -- a presentation by Emergency Management Ontario, which follows, will have more details on offsite emergency response.

The CMD also provides a list of emergency preparedness activities planned for Ontario in 2013/2014, concluding with a unified response exercise. An OPG/CNSC protocol is being established to ensure the timely delivery and support to these 2014 exercises.

It is of note that the Canadian Standard Association, CSA, is developing with key stakeholders, including the CNSC, a standard describing the requirements for emergency management of nuclear facilities. These new standards will be applicable in all Canadian jurisdictions. Public consultation is planned for 2013, with publication in 2014 for these standards.

A strong interest was shown by intervenors wanting to know what is being done in the short and long

terms for managing radioactive waste and why the deferred decommissioning strategy is the preferred approach.

OPG has an effective waste management program. All radioactive waste, including used nuclear fuel, is safely stored in CNSC-licensed facilities.

For the long-term management of OPG low and intermediate level radioactive waste, OPG has applied for a site preparation and construction licence for a deep geological depository on the Bruce site.

The long-term management of Canada's spent nuclear fuel is being handled by the Nuclear Waste Management Organization, NWMO. The NWMO is currently going through a site selection process.

OPG's waste management and decommissioning costs are funded through financial guarantees. OPG has selected the deferred decommissioning strategy. Deferred decommissioning helps to minimize workers' exposure to radiation.

At the Day 1 hearing, the Commission requested from OPG information on cyber security. CNSC staff would also like to provide information on this topic for consideration by the Commission.

As computers are employed in safety-related and security applications at Pickering, it is critical that these assets are protected against cyber threats.

Over the last several years, OPG has conducted a self-assessment on their cyber Security Program and carried out improvements to documentation and programs.

Implementation was completed in 2011 to the satisfaction of CNSC staff. The cyber Security Program now meets all regulatory expectations.

I will now pass the presentation back to Dr. Rzentkowski.

**DR. RZENTKOWSKI:** Thank you, Mr. Santini.

At the Day 1 hearing, CNSC staff committed to provide an update on the status of the follow-up actions at Pickering in response to the CNSC Fukushima Action Plan.

I am glad to say that OPG continues to demonstrate a strong commitment to address all 36 generic actions issued to all licensees of nuclear power plants.

As can be seen on this slide, all short-term actions are now closed and the remaining actions are on track to be completed as per the Fukushima Action Plan.

To date, OPG has implemented many safety improvements to further enhance accident prevention and mitigation at the site. The main ones include: deployment of emergency mitigation equipment, implementation of severe accident management guidelines,



installation of hydrogen recombiners and also progress on enhancements to emergency response as will be presented in a moment.

OPG's response to the CNSC Fukushima Action Plan and CNSC staff's assessments and inspection findings indicate that the safety case at Pickering is sufficient and remains strong.

In March 2013, the World Health Organization released their report entitled "*Health Risk Assessment From the Nuclear Accident That Followed The 2011 Great East Japan Earthquake and Tsunami*". This report was completed by an independent international group of experts. It provides an indication of the magnitude of health risks rather than the precise risk predictions.

The report provides risk estimates for both workers and members of the public. It can be seen that, for members of the general public, any possible increase in risk of cancer is likely to be below detectable levels. For the majority of workers who receive doses of less than 100 millisieverts, any possible increase in risk of cancer is likely to be below detectable levels. For a few workers who receive doses between 100 and 700 millisieverts, a small increase in the risk of cancer is expected.

The general conclusion of the report is

that the risk of adverse health impacts from radiation to the Japanese population is, in fact, very low.

Since Day 1, the current licences for Pickering A and B have not been amended. The proposed licence format and proposed five-year licence period for Pickering did not change from that submitted in CMD 13-H2.A. The proposed operating licence followed a standard format adopted for all nuclear power plants which includes a licence condition handbook summarizing the compliance verification criteria for the site.

As a result of continuous improvement, the proposed Pickering licence has three new requirements. The Pickering licence has also three site-specific licence conditions as shown on the slide.

The CNSC is committed to openness and transparency when dealing with the public and all licensing matters. The CNSC has also the common law duty to consult with Aboriginal groups on licensing matters that may adversely affect established or potential Treaty rights.

In preparation for the hearings, CNSC staff sent notification and follow-up letters to 14 identified groups in the area of Pickering. Furthermore, the Participant Funding Program which helps Aboriginal groups and members of the public at large participate in the

regulatory process for this Pickering licence renewal provided over \$67,000 to five recipients.

In December 2012, the CNSC invited members of the public to participate in the Day 2 hearing. In that Day 2 hearing, 136 written submissions were filed.

CNSC staff's overall conclusion on the assessment of OPG's performance and adequacy of licence application for Pickering has not changed from that presented at Day 1.

They are: OPG is qualified to operate the Pickering Nuclear Generating Station and OPG will make adequate provisions for the protection of the environment, the health and safety of persons, the maintenance of national security and measures to implement international obligations to which Canada has agreed.

CNSC staff's recommendations in regards to the Pickering renewal have also not changed from that presented for Day 1.

They are: CNSC staff recommended that the Commission renew the Pickering operating licence with an expiry date of June 30, 2018, and accept the delegation of authority as set out in CMD 13-H2.A.

CNSC staff also recommend that the Commission consider the Licence Condition Handbook in the decision to renew the operating licence.

Thank you very much, Mr. President and members of the Commission, for your attention.

**THE CHAIRMAN:** Thank you.

I would now like to move to the Joint Presentation on Emergency Management Plans, as outlined in CMD 13-H2.137 and I understand that Ms. Allison Stuart will make the presentation.

Please proceed.

**13-H2.137**

**Joint presentation on  
Emergency Management Plans**

**MS. STUART:** Thank you very much.

I'm pleased once again to be -- have the opportunity to present to the Commission and, for the record, my name is Allison Stuart. I'm the Assistant Deputy Minister in the Ministry of Community, Safety and Correctional Services and the Chief of Emergency Management Ontario.

My role here this morning is simply to introduce the presentation on behalf of the Region of Durham, the City of Toronto, Ontario Power Generation and Emergency Management Ontario on behalf of the Province of Ontario which is in response to a request to present the

integration of the plans: How do the plans of the various organizations fit together and how do they fit together across levels of government as well as with Ontario Power Generation itself.

And it's an opportunity for us to demonstrate: (1) that we work together easily, well and often and this is obviously important for our ability to -- in an emergency event, to be able to have a robust response.

Secondly, that our plans, as you will see, they flow up, they flow down and they flow across so that they -- the combined total really speak to the overall response.

And finally, that we continue to work on enhancing our emergency management activities at the provincial, municipal and site level to support the -- the Ontario Power Generation plant and the surrounding communities.

I'm going to turn over the body of the presentation to Dave Nodwell, who is with Emergency Management Ontario, who will be presenting an integrated deck on behalf of the organizations identified and then, of course, we're all available for any questions after that presentation.

Dave?

**MR. NODWELL:** Good morning. Dave Nodwell, for the record. I'm the Manager of Emergency Planning and Exercising with Emergency Management Ontario. I'd like to thank you for the opportunity to present to the Commission on off-site nuclear emergency planning for the Pickering Nuclear Power Plant.

In the next few minutes, I'll be discussing how the Provincial Nuclear Response Plan, or the PNERP, integrates and coordinates what would be a multi-jurisdictional response to an event at the Pickering plant.

I will, in the course of this presentation, talk specifically about many of the key elements of a nuclear response, identifying responsibilities, authorities and decision-making processes.

The key elements I'll be addressing include emergency notifications, radiation monitoring, public alerting, protective actions, the operation of reception and emergency worker centres, and how a response would transition into the recovery stage.

As well, I will put these specific actions into the context of an event timeline for an escalating event.

Before commencing, I'd like to point out that nuclear emergency preparedness brochures have been

issued in Durham Region and copies are available for the public at the back of this hearing room. We'd be happy to provide them to the Commission Members on request.

The off-site response to a nuclear emergency in the Province of Ontario is the jurisdiction of the province under the *Emergency Management and Civil Protection Act*.

While the province leads the response, the response is clearly multi-jurisdictional in nature. Consequently, as we will see, there is strong cooperation and the integration of plans between responding organizations.

The response would be guided by a number of plans which are all coordinated through and integrated under the PNERP. This plan prescribes the overall concepts and organizational structure and responsibilities for a nuclear response.

The Pickering Implementing Plan provides details specific to the Pickering nuclear power plant.

The PNERP is implemented by the Provincial Emergency Operation Centre, or the PEOC. It is the PEOC Commander that, throughout the course of the response, directs the actions of municipalities and provincial ministries, while coordinating the support provided through federal departments and Ontario Power Generation.

Conforming to the PNERP are Municipal Emergency Response Plans owned by Durham Region, the City of Toronto and Peterborough.

These plans, in turn, assign specific functional responsibilities to their respective departments, police services, EMS, school boards and other agencies.

These plans operationalize such things as emergency worker centres, reception centres, and manage local evacuations, among others.

OPG provides logistical support, for example, decontamination assistance, to most of these response facilities and as such is closely aligned to the appropriate municipalities.

As well, 12 provincial ministries have plans to undertake the responsibilities assigned to them under the PNERP.

In addition to ministry support plans, specialized plans include Joint Traffic Control, the Assurance Monitoring Group and the Radiation Health Response Plan, which all integrate support from both the appropriate municipalities and as well federal departments.

For example, Durham Region and Toronto are active partners with the Ministry of Transportation on



Joint Traffic Control, and Health Canada is an integral partner in the Assurance Monitoring Group through radiation monitoring and scientific analysis.

No circle on this slide remains isolated. Each is strongly integrated with the PEOC and appropriate partners from supporting agencies and departments.

Surrounding the Pickering nuclear plant are municipalities designated under the PNERP as being either host communities or primary zone communities. Specifically, Durham Region and the City of Toronto are designated primary zone communities and the City of Toronto, as well as Peterborough, are designated as host municipalities.

It is important to acknowledge that all designated municipalities have a Nuclear Emergency Response Plan that is submitted to the province. This plan must conform to the PNERP, and this was confirmed during a 2012 Municipal Conformity Review conducted by Emergency Management Ontario, the results of which were presented to the CNSC last year.

Beyond the designated municipalities, every municipality in the province has, as required by the *Emergency Management and Civil Protection Act*, an emergency program and emergency plans for hazards in their area. All have emergency plans, response structures and

procedures in place.

Case in point, Northumberland County, which is adjacent to Durham Region to the east, has an emergency program with the capability to deal with numerous emergencies, but considers as well the potential impacts in their area of a nuclear emergency: impacts such as food and water control, traffic demands on hotels, food supplies, gasoline, et cetera.

This was in fact discussed at a recent county-wide emergency management meeting held in April of this year.

I will now move to the specifics of a response.

In the event of an incident at the Pickering nuclear plant, the first action by certified operation staff is to mitigate the event and ensure that critical parameters are monitored.

The OPG Shift Manager then categorizes the event into one of four notification categories, which I will be discussing later in this presentation, which denotes the severity of the event and approves the formal notifications.

The Emergency Shift Assistant notifies the Provincial Emergency Operation Centre, Durham Region and the City of Toronto within 15 minutes of the

categorization of the event.

The Emergency Shift Assistant will also notify the CNSC within 30 minutes of categorization of the event.

These notification procedures are tested several times a year.

Within 15 minutes of receiving the OPG notification, the PEOC Duty Operation's Chief will confirm the default response level and notify the designated municipalities, as well as OPG. This process is outlined in detail in PEOC Nuclear Response Procedures.

Immediately following municipal notification, the PEOC Duty Officer notifies the rest of their emergency response organization, again in accordance with PEOC Nuclear Response Procedures.

Duty staff at all levels are immediately available, 24/7, 365 days a year, and after business hours, contact information for the emergency response organization is maintained by the PEOC.

After receiving OPG and provincial notifications, the municipalities will activate based on the determined provincial response level.

The municipalities will, as appropriate, notify their designated response personnel and, if directed by the PEOC, will activate public alerting,

protective measures, emergency centres and traffic control measures, in accordance with their emergency plans.

Municipal notification is conducted by the Durham Emergency Management Office in Durham Region, the Toronto Office of Emergency Management in Toronto, and the Emergency and Risk Management Division of the City of Peterborough.

Facility notification categories and corresponding provincial off-site response levels are outlined in detail in the PNERP Pickering Implementation Plan, Tables 3.1 and 3.2.

A reportable event is any event that would be of concern to off-site authorities, event such as an earthquake or reduced ability to carry out off-site emergency support, or a security threat.

The provincial response to this is routine monitoring, which is the normal mode for the PEOC, which has a 24/7 Duty Officer. In-house nuclear scientists and other experts may be consulted at this stage.

An example occurred on Friday, May 17<sup>th</sup>, 2013, when two earthquakes were felt in Ontario and Quebec. This event triggered the notification of a reportable event from Pickering and other nuclear stations, all reporting no damage.

An abnormal incident is any abnormal

occurrence that has a significant cause and could lead to more serious consequences.

Examples include a loss-of-coolant accident, with or without containment failure, but no failure or extreme environmental conditions.

The provincial response is enhanced monitoring which includes establishing a duty team consisting of operations and scientific staff, an OPG representative, emergency information staff and others as required. Other provincial staff are notified to remain on standby and municipal staff are monitoring.

An onsite emergency is any serious malfunction which could result in a radioactive emission. Examples would include a LOCA with fuel failures, spent bay, spent fuel bay accident or earthquake damage.

The provincial response is partial activation, which results in the full staffing of the PEOC and establishing municipal emergency operation centres, emergency information centres and other emergency centres, such as reception and emergency worker centres are readied to become operational.

A general emergency is an ongoing or imminent within 12 hours radioactive atmospheric emission. Examples include a LOCA with fuel failures and impaired containment or the loss of the control room.

The provincial response is full activation, which operationalizes the entire emergency response organization and results in the issuance of operational directives and emergency bulletins, including the activation of public alerting.

In an -- I'm sorry, my mouse malfunctioned on me.

In an emergency response, the PEOC receives field monitoring data from three primary sources: offsite surveys conducted by OPG, the provincial assurance monitoring teams who sample air, water and food, and fixed aerial and ground monitoring activities conducted by Health Canada.

OPG provides the first transmittal of information within two hours of the categorization of the event and every hour thereafter until stood down by the province.

Based on plant status information provided by OPG, and together with the field monitoring data, the information is analyzed by the scientific section of the PEOC to inform protective action decision-making by the PEOC commander.

The activation of the public alerting system is authorized by the PEOC commander except in a general emergency where the activation of public alerting

is a default action. In the circumstances of a general emergency, the region is authorized to immediately activate the public alerting system.

Public alerting for the Pickering three-kilometre zone is within 15 minutes of initiation, with warning to practically 100 percent of the people in that zone, both indoors and outdoors. The three-kilometre zone in Pickering is now fully covered by a siren system.

An auto-dialler system is in place to alert the public within the 3 to 10-kilometre zone surrounding the Pickering nuclear plant. Enhancements to the current system are being evaluated by a team comprised of Emergency Management Ontario, OPG, Durham Region and the City of Toronto to ensure that the PNERP requirement of notification on an area-wide basis within 15 minutes is met.

The PEOC has, as well, Ontario's emergency public warning system, which can be activated to notify the public within the 10-kilometre area and beyond, in fact across the entire province.

This system is used for all types of emergency warnings throughout the province for events such as power outages, major transportation accidents, tornadoes and chemical spills, to name a few.

The system relies on local television and

radio broadcasters, including direct access to the Weather Network, email, SMS notification to subscribers, RSS feeds and social media such as Facebook and Twitter.

Anyone in the province is welcome, and in fact encouraged, to sign up for these emergency notifications through the Emergency Management Ontario Web site.

The PEOC issues advisories to the affected public on protective measures to be taken in a nuclear emergency through emergency bulletins. These bulletins are pre-prepared and written in French and English.

A provincial emergency information section is activated to issue provincial emergency public information while a local emergency information centre is activated by the municipality to communicate local emergency public information.

Provincial nuclear emergency information in any event will be sent to all main media outlets by the Canadian wire service.

I would like to point out that in an event, regional departments and PEOC staff would regularly monitor local media to ensure appropriate emergency information is being provided to local residents and to take necessary remedial action from this information, if required.



Protective action decisions are made by the PEOC commander. These decisions are based on a calculation of projected doses, and the PNERP's predetermined protective action levels, otherwise known as PALs. These are consistent with the Canadian guidelines for intervention during a nuclear emergency, which is published by Health Canada.

Protective actions will be decided on and directed by the PEOC commander for those sectors where the estimated projected doses are expected to meet the PNERP PALs for sheltering, evacuation and food, water and milk controls.

Sheltering is directed for gradually escalating events, and as the automatic default action within the 3 kilometre zone for an onsite emergency notification. Evacuations will be directed as the automatic default action within the 3 kilometre contiguous zone for a general emergency notification from the nuclear facility.

The Provincial Chief Medical Officer of Health is responsible for decision-making regarding KI ingestion. KI ingestion will be directed for gradually escalating events where technical and monitoring data analysis results in projected thyroid doses which meet the PNERP thyroid blocking PAL and as the automatic default

action within the 3 kilometre contiguous zone for a general emergency notification where an emission is ongoing or where evacuations will not be completed prior to the emission.

KI pills are available to the public at designated pharmacies free of charge at any time. And during an emergency, KI pills are available for the public at reception centres and other designated facilities, such as schools.

It is important to recognize that protective actions are not restricted to the 3 kilometre contiguous zone or the 10 kilometre primary zone.

The PNERP provides the flexibility for protective action decision-making by the PEOC commander and based on scientific assessments for areas beyond 10 kilometres as may be required. Processes, decision-making procedures, and response infrastructure is in place to manage beyond 10 kilometres if necessary.

The Ontario strategy for a major evacuation reflects lessons learned from major evacuations that have occurred in other countries and after extensive study and analysis.

Evacuation details are communicated through emergency bulletins, discussed earlier, and are issued by the Provincial Emergency Operations Centre to provide

public direction to evacuating residents.

Most residents will self-evacuate based on direction provided by the province. However, Durham and Toronto plans include detailed evacuation plans for those residents without transportation.

Evacuees not at risk of contamination would be advised to evacuate in the direction and to the destination of their choosing. However, evacuees who may have been exposed will either be directed to a monitoring and decontamination unit or advised to self-decontamination upon reaching their destination. Instructions for self-decontamination are included in the emergency bulletin.

Evacuation traffic is managed by the Joint Traffic Control Centre, which is located in the City of Toronto. It includes staff from the Ministry of Transportation and police services from Durham Region, Toronto, York Region and the Ontario Provincial Police.

Traffic control plans are designed to use an all routes out approach and is implemented in three incremental stages. Stage one ensures that all major routes out of the primary zone are flowing smoothly.

Stage two would be ordered by the PEOC when it appears likely that evacuations may become necessary. Highway 401 would be closed to through traffic and a

diversion route around the primary zone put into place.

Stage three is ordered by the PEOC when particular response sectors are to be evacuated.

Additional traffic control resources may be deployed to ensure that the evacuee traffic moves as safely and quickly as possible out of the primary zone and beyond. Evacuations would be expanded as required and as directed by the province.

The updated draft Pickering joint traffic control plan will be issued in December of 2013, and will be based on a new and advanced traffic modelling software.

This map identifies the reception and emergency worker centres that would be activated in a Pickering nuclear response. Note that they are strategically located both east and west of the Pickering site. Reception centres are set up during emergencies to monitor and decontaminate people and to provide emergency social services. OPG staff provides monitoring and decontamination support.

Social Services coordinates the reception of evacuees, including registration and inquiry, allocation to evacuation centres, first aid and other personal support services.

Emergency worker centres are established to protect emergency workers and provide monitoring and

decontamination. When ordered by the province, all workers, including police, fire, EMS, transit, utilities and so on, will be required to report to an emergency worker centre before entry into the primary zone.

The Durham Region Police Service have operational control of that centre in Durham Region and Toronto Fire runs the emergency worker centre in Toronto. OPG staff provide monitoring and decontamination support. Other centres can be set up as required.

At the end of the response phase of the emergency and the transition to the recovery phase would be directed by the PEOC command once the following conditions have been met: that the nuclear reactors are in a guaranteed shutdown state and that no further emissions at significant levels are anticipated. In other words, they do not adversely affect public safety or warrant any exposure control measures.

Recovery planning will be based on the situation at the time and will have the benefit of international guidance, actual data collection, stakeholder involvement, decisions such as if and when to allow people to return home to decontaminated areas.

As a part of the recovery stage, radiation protection considerations would be addressed, together with health, environmental, social and other

considerations.

Timelines obviously can vary considerably based on the nature of an incident and this chart outlines the response to an escalating situation. But as we discussed earlier in a general emergency actions are automatic and public alerting is initiated immediately.

You will notice that notification is complete within 30 minutes and response organizations are being stood up to respond as necessary. Within 120 minutes the response organization is operational at the provincial and municipal levels on a 24/7 basis. And in the case of an onsite emergency, worker safety centres and reception centres would be ready to be operationalized.

Throughout this timeframe scientific assessment is ongoing, decisions are being made at the PEOC command level and communications staff are active. Staff are on hand, including liaison officers and both prepared and positioned to deal with the further escalation of the event.

In the case of a general emergency timelines would be reduced considerably and accommodations are made for this in the PNERP. For example, public alerting would be activated immediately upon the notification of a general emergency and the process of clearing out the 3 kilometre zone would commence

automatically.

Response action such as this based on plant conditions versus plume modelling analysis is consistent with international best practices and recommendations of the International Atomic Energy Agency.

In conclusion, a nuclear emergency response would be led by the province and be multi-jurisdictional in nature. This allows us to incorporate and integrate the respective assets, resources and expertise of municipal, provincial and federal organizations into a nuclear response.

The PNERP outlines how this coordination is achieved and how the objectives of protecting public health, safety, property and the environment are met.

Planning is not done in isolation of one another but through ongoing cooperation and Emergency Management Ontario continually works with all nuclear stakeholders to ensure conformity to the PNERP and to ensure alignment among plans.

Some examples of this work include the very active Nuclear Emergency Management Coordinating Committee the recent municipal conformity review conducted by EMO in 2012, the housing of an OPG planner within the EMO planning section on a weekly basis, and current consultations with Health Canada to update the Ontario

annex to the Federal Nuclear Emergency Response Plan.

Thank you very much for the opportunity to be able to present this to you today. I am joined by colleagues from Emergency Management Ontario, OPG, Durham Region, and the City of Toronto to answer any questions that you may have.

**THE CHAIRMAN:** Thank you. Thank you very much.

And I first of all would like to thank you for clarifying some of the mystique that goes around emergency management.

You obviously -- if you read some of the intervention that we received you are a subject of great interest in this hearing. And I hope that you will stick around with some of the intervenors who will have lots of questions about this particular subject.

I thought that I'll take a few minutes before the break, with an intent to have our first round of questioning at this stage but I think that there may be some clarification questions that colleagues may want to address at you and your team while you're here right now.

So very short clarification; first of all let me start. That's the first time I've seen these and how recent are they and were they distributed to the public?



**MR. LEONARD:** For the record, I'm Warren Leonard; I'm the new Director of Emergency Management in Durham Region.

Those were distributed just this past April. The one that's titled "Nuclear Safety -- Nuclear Public Safety", 108,000 copies went out to everyone in the 10 kilometre zone for Darlington and Pickering, all homes and businesses the week of April 8<sup>th</sup> to 12<sup>th</sup>, 2013.

The other one that you have, titled "Emergency Public Alerting System", 7,400 copies were distributed in the 3 kilometre zone for Darlington and Pickering, all homes and businesses the week of April 22<sup>nd</sup> and 26<sup>th</sup>, 2013.

**THE CHAIRMAN:** And are you getting some response, reaction?

**MR. LEONARD:** We've received response; some people call up and say thanks for them. I wasn't actually working for Durham at that time but I've heard that my understanding is some people phone up and thanked them, other people phone for further clarification and we can point them to other sources of information.

I would say generally it's very positive.

**THE CHAIRMAN:** Thank you.

Anybody else with a question?

Dr. McDill?

**MEMBER McDILL:** Thank you.

Two questions -- can everybody hear me in the back? Thank you.

You're studying enhancements to the current systems. When do you expect to have results -- on page 10 of your presentation?

**MR. NODWELL:** Dave Nodwell, for the record.

We do, as I mentioned in the presentation, have a team that is looking at different technologies. We have been active, quite active over the past three or four months. We are meeting, actually in the near future, with a consultant that will be looking at -- or who will be able to advise us in the effectiveness and the degree of penetration related to a number of technologies that we're using.

I would expect that we would have additional information on this in the fall.

I'm unable to project beyond that in terms of what those recommendations might be, and the time required to implement them.

**MEMBER McDILL:** Thank you.

It has taken some time for the sirens, so it -- it's a question of interest.

With respect to the Joint Traffic Control Centre, do you think, for example, that the -- this is on

page 12 of your presentation -- do you think that the public around Pickering -- and Darlington, since it's in a similar area -- understand that there is a Joint Traffic Control Centre?

**( SHORT PAUSE/COURTE PAUSE )**

**MR. NODWELL:** I would -- Dave Nodwell, for the record.

I'd like to defer that to a representative of the Ministry of Transportation.

**( SHORT PAUSE/COURTE PAUSE )**

**MR. BOT:** Good morning. My name is Noris Bot. I'm the Manager of the Emergency Management Planning Office with the Ministry of Transportation of Ontario.

The question that was asked is regards to the knowledge of the public in regards to the Joint Traffic Control Committee. That committee is really part of ---

**MEMBER McDILL:** Actually, it's the Centre.

**MR. BOT:** The Centre?

**MEMBER McDILL:** The Centre.

**MR. BOT:** Sorry.

The Centre is the location where the Traffic Control Committee operates from, and it's really not necessarily a need for the public to know. It's part of a provincial emergency operation centre's response,

organization and mechanism that we've established.

So as long as the message is going out and the governance -- the necessary decisions are being made, the location of that Centre is not necessary for the public.

**MEMBER McDILL:** Let me try the question a different way then: Has the Centre been exercised in recent years?

**THE CHAIRMAN:** How about this morning for Don Valley.

**( LAUGHTER/RIRES )**

**MR. BOT:** Do you know, Dave?

**MR. NODWELL:** Dave Nodwell, for the record. We had a major nuclear emergency exercise last fall and, granted, it was for the Bruce Power Plant and the Joint Traffic Control Centre was activated and tested for that exercise.

**THE CHAIRMAN:** Mr. Tolgyesi?

**MEMBER TOLGYESI:** I have one.

You were talking about potassium iodide pills, that they are available in the schools and designated pharmacies.

How the populations knows that, where they are, because when the rush hour is coming, everybody wants to have them?

**MR. LEONARD:** For the record, it's Warren Leonard.

The availability of potassium iodide pills to the public is something that we consistently message out, in our pamphlets; on our web site. Sometimes, we'll receive questions directly from the public.

So it's part of our ongoing message in personal preparedness in this region that those -- that that's an availability that they can take advantage of, and the locations of those pharmacies.

**THE CHAIRMAN:** Some intervenors are claiming that there is not enough pills around, in case of your highest incident. There's not enough pills to go -- if you cover -- if you were to cover a chunk of Toronto.

Is that true?

**MR. LEONARD:** Well, the KI pills that are made available at the pharmacy are still in stock there; those that have come and received them. If there's more required, the pharmacies will just get more from OPG.

There's also KI pills available -- in the event of an incident -- available for them at reception centres. So they're available ahead of time and they're available during the event.

**THE CHAIRMAN:** So in case there is a "Doomsday Scenario", as I always like to call it, there'll

be enough to go around for everybody who needs it?

**MR. NODWELL:** Dave Nodwell, for the record.

With respect to the number of KI pills that are available, it's a requirement that there are enough for everyone in the 10-kilometre primary zone, and that is the case.

**THE CHAIRMAN:** So what if anything goes beyond?

I think that's some of the interventions that you will be hearing from, arguing that sometimes it will go beyond the 10-kilometres.

Where do you find the pills then?

**MS. STUART:** Allison Stuart, for the record.

The capacity to provide KI pills beyond the 10K limit has not been addressed broadly. We are anticipating the release of the Radiation Health Response Plan by the Ministry of Health which does deal with advice on KI, and this will be a starting point for looking at KI issues, as raised by some of the intervenors, but also KI issues more broadly will be tackled at that time.

**THE CHAIRMAN:** Thank you.

Ms. Velshi?

**MEMBER VELSHI:** Just following up on KI pills, do you monitor the number of people who request or

get KI pills from pharmacies?

And I don't know if it's an indication of the level of anxiety or not.

**MR. LEONARD:** For the record, Warren Leonard.

Yes, we do. Last fall, they were all redistributed because of their expiry date, to the pharmacies last -- last fall, and there were -- since that time, the number of tablets distributed to the public is 4,270.

**MEMBER VELSHI:** And is that what you typically see in a year or has the number gone up or down?

**MR. LEONARD:** I'm afraid I'm not aware of the historical uptake on those.

I know that's what's happened since we redistributed them fresh last November.

**MEMBER VELSHI:** Thank you.

**THE CHAIRMAN:** Dr. Barriault?

**MEMBER BARRIAULT:** Thank you, Mr. Chairman.

On the issue of the KI pills, does the pharmacy charge a dispensing fee?

I know they're free, the pills themselves, but does the pharmacy charge a dispensing fee, and, if they do, who picks it up?

**MR. LEONARD:** For the record, Warren

Leonard.

No, they don't. They're dispensed free.

**MEMBER BARRIAULT:** They do it as a public service?

**MR. LEONARD:** That's right.

**MEMBER BARRIAULT:** Okay.

My second question, really, on the auto-dialer for a 10-kilometre zone, what message is on the auto-dialer given to -- is it a variable message, does it change, or how does that work?

I'm just trying to understand what information is given.

**MR. LEONARD:** For the record, Warren Leonard.

The messages that we have are already pre-recorded, ready to go, and they're based on the public bulletins that the province has already got drafted and ready to go as well.

**MEMBER BARRIAULT:** So would it give wind direction, for example, and velocity of winds and all that kind of stuff? No?

**MR. LEONARD:** For the record, Warren Leonard.

No, that would have to be inserted at the time, because that's a variable that is unknown until that



time.

**MEMBER BARRIAULT:** Thank you.

Thank you, Mr. Chairman.

**THE CHAIRMAN:** Monsieur Hervé?

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

Just one question: Such major emergency activation is not quite frequent and it's correct. It's okay.

How can we be assured that it will work? It's a complex organization and how can be maintained the efficiency?

You mentioned that you had many contacts and meetings but, if something happens tomorrow, how can we be sure that it will work?

**MS. STUART:** Allison Stuart, for the record.

The challenge, of course, is to maintain that effectiveness. It's one thing to have on paper, and important to have on paper, but we do need to make sure that the pieces actually work when they'd need to.

On a regular basis, both within the year and annually, there are exercises that test different parts of the system, not always nuclear related but different parts of the system that will be put into play,

should there be the need.

We have, as you know, an exercise that's planned for 2014, and there will be significant lead-up work to prepare for that broad based and intensive exercise.

We are also, over the next three years, having three exercises connected to the Pan Am Games. And again, opportunities to address and deal with issues that while are not specific to nuclear but have application for nuclear, like transportation, like communication, information sharing, et cetera.

So it's through those exercises, big and small, because not all exercises need to be big and all-inclusive to do a really nice test of the readiness of the various players.

**MEMBER HARVEY:** But how those exercises are known in advance? I mean, you advise people that there will be an exercise in two months, three months, but do you do some tests to see if people are ready without any advice in advance?

**MS. STUART:** Allison Stuart, for the record.

So the question is do we do any spot tests without any advance warning and so on and so forth?

We do, in a very minor way, in terms of

notification systems to make sure that they're working and people will be contacted and required to report within a certain timeframe, that sort of thing.

But the exercise itself is done in a planned way. This allows us to maximize the learning, the preparation, and the testing that's available. The exercise itself, the nature of an exercise is that most people don't know what's going to happen in that exercise.

There is a central group, which I'm not part of frankly, that does know what the exercise is about and what are the injects, what are the complications that are going to be introduced to the players during that exercise.

So there is that level of spontaneity and having to take -- to move from what's in a book about what you're supposed to do to more of a quasi-real life approach.

**THE CHAIRMAN:** Thank you. I think this -- we'll continue this discussion over the next two days, I suppose.

So we'll take now a 15-minute break. Thank you.

**MR. LEBLANC:** And we will start with the interventions upon our return.

--- Upon recessing at 10:37 a.m.

L'audience est suspendue à 10h37

--- Upon resuming at 10:53 a.m.

L'audience est reprise à 10h53

**THE CHAIRMAN:** Okay, we are ready to begin with the interventions. And before we start, I'd like to remind everybody that we allotted 10 minutes for the interventions.

We've read all the written material, trust me, we've read every line submitted, and we would like to have the time to ask questions on the written material and the oral presentations, so please help us in keeping to the time allotment.

And I would like to start with the first oral presentation from Ajax-Pickering Board of Trade, as outlined in CMD 13-H2.2.

I understand that Mr. Zolis and Mayor Ryan will make the presentation. Please proceed, gentlemen.

**13-H2.2**

**Oral presentation by the  
Ajax-Pickering Board of Trade**

**MR. ZOLIS:** Good day. My name is Bill

Zolis, and I'm the 2013 President of the Ajax-Pickering Board of Trade. And I'm pleased to have with me the City of Pickering Mayor, David Ryan.

On behalf of the local business community, I would like to welcome the Canadian Nuclear Safety Commission to Pickering, and thank you for the opportunity to participate in this process.

As the voice of Ajax and Pickering business community, we represent over 550 businesses in Ajax, Pickering and the surrounding areas. The Ajax-Pickering Board of Trade requested to appear before you today to demonstrate our support for the Ontario Power Generation's operating licence renewal application, as it relates to the Pickering nuclear generating station.

Our endorsement of this project has been based on several factors, including OPG's commitment to environmental sustainability. They were the first to achieve level 3 in our Eco-Business Program, the highest level of achievement.

OPG's commitment to safety, Pickering Nuclear has been maintained and safely operated for more than 40 years and has recently invested more than \$100 million in additional inspections and maintenance to ensure the continued safety of the site.

OPG's openness and transparency, in station

operations, and communications, with the community; OPG's strong support of local initiatives demonstrated through financial contributions and staff participation in numerous charitable and community building efforts; OPG's long-time commitment as a strong member in good standing of the Ajax-Pickering Board of Trade.

I would like to expand on these points demonstrating the work of Ontario Power Generation and the respect they've earned.

In terms of openness and transparency, I can say without a doubt that OPG consults and communicates with community stakeholders in a timely manner on every issue demonstrating that safety is its number one priority.

Through these ongoing communications, we understand that OPG's operations under the careful watch of CNSC staff; we know that CNSC evaluates Pickering in 14 areas of safety and control, and that OPG continues to meet or better the performance expectations.

Those of us who live and work in the area are well aware of the company's commitment to sustainability, environmental stewardship. There is not sufficient time to list all OPG's stewardship initiatives. However, permit me to mention two.

OPG and its employees partner with

Africycle, a business -- sorry a bicycle collection program that provides essential transportation to remote regions of Africa.

OPG is a partner in Bring Back the Salmon, an initiative to return the Atlantic salmon population in Lake Ontario to the greater numbers that once existed.

There, these efforts have not gone unnoticed. In the recent past, OPG and Pickering Nuclear's commitment to sustainability has been recognized with a number of local and international awards.

In fact, our board successfully nominated OPG and its employees for the 2012 Town of Ajax Civic Award for environmental stewardship.

In terms of safety, Pickering Nuclear has maintained and safely operated the station during the current five-year licensing period, and in nearly 40 years of operation, no member of the public has ever been harmed as a result of their operations.

Employees at this station hold safety in a conventional and radiological sense as an overriding priority. In fact, Pickering Nuclear employees have worked more than 10 million hours without a lost time injury.

Following the unfortunate events in Japan, OPG redoubled their already strict safety efforts. Year

after year, OPG demonstrates outstanding support and participation in a host of community activities. In fact, it's difficult to think of a community activity that does not benefit from support and participation of OPG and its employees.

Pickering Nuclear invest more than \$330,000 annually in the community partnerships that enhance educational opportunities for youth, build a sense of community and establish an ever stronger commitment to environmental stewardship.

And the support does not end with activities offered through the City of Pickering and community organizations. Employees at Pickering Nuclear also offer programs of their own. Thousands of children, their parents, and sometimes grandparents, enjoy the annual weeklong March break programs. Every Tuesday in July and August, thousands of children and their families enjoy the "Tuesdays on the Trail" hosted by OPG employees.

Twice a year, OPG employees participate in Operation Clean Sweep. Employee volunteers assist seniors by completing yard work that they can no longer complete around their homes. This support gives the seniors a new lease on life.

Also, twice annually, Pickering Nuclear employees host Take Pride in Pickering Day at Alex



Robertson Park, where thousands of native trees and shrubs have been planted, nesting boxes installed and wildlife habitats developed.

OPG employees across Durham Region donated countless volunteer hours and over \$700,000 to charities in 2012. I've been honoured to know many who have held leadership roles with United Way, Big Brothers and Sisters, Horizon House, the Rouge Valley Health System Foundation, the youth centre, and two of the past presidents of our Board of Trade were employees of the Ontario Power Generation.

Ultimately, let me say that we are proud of our partnership with Ontario Power Generation and their role as community builders.

The Ajax-Pickering Board of Trade strongly supports Ontario Power Generation's application for a renewal of its operating licence for the Pickering Nuclear Generating Station. We trust you will find this re-licensing application deserves to be approved.

I thank you for the opportunity to speak and I would like now to turn it over to Mayor Ryan.

**MR. RYAN:** Thank you. And I'd like to thank the Ajax-Pickering Board of Trade for sharing their time.

For the record, I am David Ryan, Chair of

the Canadian Association of Nuclear Host Communities, commonly known as CANHC, as well as the Mayor of the City of Pickering, the host community of the Pickering Nuclear Generating Station.

Today, I am acting in the capacity as the head of both organizations and will be addressing the Commission as such.

First, let me briefly introduce CANHC. This is a national organization comprising the heads of council of all nuclear host communities from New Brunswick to Manitoba.

It provides a forum for our members to share knowledge and best practices to enhance working relationships within the nuclear industry. Most importantly, CANHC provides support to its members through public hearing participation and liaison with various government agencies to further our objectives.

Now, as the Mayor of the City of Pickering, let me extend my sincere wealth and appreciation to the CNSC for hosting public hearings here in our municipality.

We have been the host community for the Pickering Nuclear Power Station for 40 years and have been involved in previous hearings related to the operation of the station.

Upon review of the OPG application to renew

the licence for continual operation of Stations A and B, both CANHC and the City of Pickering quickly realized that both organizations share similar views and decided to collaborate and make a joint submission.

As in all previous submissions made by CANHC and Pick City with respect to nuclear operations and proposed nuclear undertakings, we have repeatedly advised the Commission that public safety is our number one priority.

In the current application made by OPG, the matter of public safety is even more significant given the close proximity of the nuclear station to a large residential population. We firmly believe that any nuclear installation should not be endorsed at the expense of compromising public safety.

That said, we are pleased with OPG's exceptional track record for the safe operation of the Pickering station and have every reason to believe that OPG will continue to uphold its excellent safety record.

For example, the Pickering station has been safely operating for more than 40 years. Following the events in Fukushima, we understand that OPG has made substantial investments towards enhancing safety equipment and procedures.

In the CNSC's annual nuclear station

performance report, we note that the Pickering station continues to meet or exceed performance expectations in all 14 safety-related areas.

All of these factors demonstrate that OPG has given public safety its upmost attention and top priority in the continuation of the operation of the Pickering station.

Both CANHC and the City of Pickering value the economic benefits associated with the Pickering Nuclear Station. The continued operation of the Pickering station is essential to sustain employment opportunities, boosting housing, commercial and industrial development and generate tax revenues for local governments.

Last but not least, OPG has been an excellent corporate citizen in Pickering and Durham Region, and we welcome the opportunity to foster that relationship in coming years through meaningful sponsorships and the continued engagement of OPG's employees and various community activities.

In conclusion, both CANHC and the City of Pickering fully support the OPG application to renew the operating licence for the Pickering station and I thank you for the opportunity to comment on this application.

That concludes my presentation. Thank you.

**THE CHAIRMAN:** Thank you.

I'd like to open the floor. Mr. Tolgyesi?

**MEMBER TOLGYESI:** Mr. Mayor, you were saying that you are Chair of the Nuclear Facilities Hosting Communities Organization, are native communities members of this -- your organization?

**MR. RYAN:** Not at the moment, but it's something that we've recently started to address and that we will be extending invitations.

**MEMBER TOLGYESI:** And you were saying that it's from New Brunswick to Manitoba. That means -- did I understand well? So Saskatchewan is not included?

**MR. RYAN:** I'm sorry?

**MEMBER TOLGYESI:** Saskatchewan is not included in the communities ---

**MR. RYAN:** No, not at this time.

**MEMBER TOLGYESI:** And my second question is to Board of Trade; you were talking in your presentation about eco-business certification. Is it the Board of Trade who gives out this certification and what's that?

**MR. ZOLIS:** For the record, Bill Zolis.

Yes, we have developed a tool that our members can use. And you've got a process to go through. And the highest level is Level 3. We started with Level 1 and we worked our way, and we've actually won an award for this process. So it is something that we developed in-

house.

**MEMBER TOLGYESI:** It consists of what?

**MR. ZOLIS:** Well, basically it's -- there's, you know, a bunch of questions and they have to be answered and there are many questions. I mean, you know, it could be your lighting, I mean, do people carpool. There's many areas, there's a whole bunch of sections in it.

I personally didn't develop it, but you've got all this criteria and then there's a score at the end of it. And then if you reach the score that's a passing score, you receive a certificate.

And OPG was -- Level 3 is a lot stricter than Level 1. Level 1 pretty well, you know, if you just do some simple things, but Level 3 is extensive. And they did -- they were the business that received our Level 3 award.

**THE CHAIRMAN:** Thank you.

**MEMBER HARVEY:** I had the same question, but how many -- I had the same question, but just to follow, how many other business have achieved that level?

**MR. ZOLIS:** Do you know what, unfortunately I don't have that information in front of me. Not many. Not many. I mean we only -- again, we have 550 -- over 550 members. Very few have reached Level 3.

And you know, I could get that information for you later, right now I don't have it.

**MEMBER HARVEY:** That's okay. Thank you very much.

**THE CHAIRMAN:** Ms. Velshi?

**MEMBER VELSHI:** Thank you.

Mayor Ryan, as head of CANHC, how does Pickering compare with other nuclear facilities as far as community building efforts; is this pretty much what's expected or is Pickering Nuclear sort of exceptionally at the head of the pack?

**MR. RYAN:** For the record, David Ryan.

Generally in our experience across the industries and the individual plants are working very diligently to include their communities as a whole and to communicate well.

I think Pickering Nuclear, quite frankly, is a stand-out, they work very closely here in our municipality. We're very pleased that, you know, a large number of the -- of the Pickering -- the Pickering plant population employees actually live in Pickering and the Durham Region, as well as the executive, which I think speaks volumes, and that also lends to the -- the level of communication and commitment here in the community.

**MEMBER VELSHI:** Thank you.

**THE CHAIRMAN:** Can I piggyback on that? If memory serves, some of the intervenors criticize the council for not allowing for public discussion of this, you know, supposed for renew -- licence renewal.

My question is do you get much discussion about OPG in Pickering MPP at council?

**MR. RYAN:** David Ryan, for the record.

And the -- the answer, Dr. Binder is no, we do not have a lot of concern from the community expressed to council.

I can tell you as the Mayor, that other than the one that you have just referenced, I have not had a single call to my office with any concern whatsoever.

**THE CHAIRMAN:** So you figure the vast majority of citizen here support?

**MR. RYAN:** Dr. Binder, when the plant opened 40 years ago, the population of Pickering was 18,000. Today, we're a population of 95,000 and growing; we all moved here with the full realization that the Pickering plant was here and operating.

Over the years, I've been in office -- in the mayor's office, I've been on council since '94, in the mayor's office since 2003. We have had very little concern overall expressed.

Following the events at Fukushima, for



example, I did not receive nor did any of my council report a single call of concern from our residents about the PNGS, and in fact, the -- the March break occurred shortly after, and as was referenced in Mr. Zolis' presentation, OPG opened its doors at the information centre, as they do every year to -- to host our community, and all of those programs were fully attended. No one stopped coming to the station. We are confident in our -- in our nuclear station.

**THE CHAIRMAN:** Thank you.

Anybody else?

Thank you, thank you very much.

**MR. RYAN:** Thank you.

**THE CHAIRMAN:** I'd like to move now to the next submission which is an oral presentation from Ms. Chung as outlined in CMD 13-H2.34.

Please proceed.

**13-H2.34**

**Oral presentation by**

**Kathleen Chung**

**MS. CHUNG:** Good morning. I'm once again very sorry to meet with you because I oppose nuclear plants -- sorry.

I speak on behalf of my five young grandchildren who live and go to school within range of the Pickering plant.

I'm a member of the Canadian Voice of Women for Peace, the Older Women's Network, Canadian Unitarians for Social Justice and the Green Team of my church. We all work for peace, justice and for our descendants, but my words are my own.

I remind you of a Haida proverb:

*"We do not inherit the earth from our ancestors. We borrow it from our children."*

This is about future generations. Renewing the licence of the Pickering plant is to saddle future generations with a poisonous legacy, not one I want to leave for my grandchildren or your grandchildren.

The plant has reached the end of its life. It was predicted for safety and it's now time to say goodbye. Even OPG has acknowledged that, for safety reasons, 2012 was the end of its life.

We have the resources to create a different future. The people of Ontario are far ahead of the government in seeing the urgency of the problem and our need to develop renewable power resources and conserve energy.

What's holding Ontario back from developing

renewable energy instead of nuclear? It's the old boy's network which controls the power industry and the construction industry; its lack of vision and its greed.

As you know, the public see the continuation of nuclear power as a get rich scheme for nuclear executives, ex-politicians, consultants and a few super-techies. Just one more make-work project for nuclear workers, construction and management, and I don't need to tell you about the enormous cost overruns of maintaining and refurbishing nuclear plants.

No nuclear plant has ever provided reliable power. They all, like Pickering, have been shut down for prolonged periods. So there just comes a time when we have to cut our losses.

People may mock solar and wind as unreliable, but nuclear is really the least reliable of all.

My biggest concern is safety. When Harper fired Linda Keen as the Canadian Nuclear Safety Commission

President, that proved to me that safety is not a concern of the government. Profit is a concern, and whose profit? One who profits is, of course, SNC Lavalin, given contract after contract, bribing officials all over the world and we can't help wondering who they've bribed

in the Ontario nuclear power regime.

We've also been warned about organized crime coming in, just as in Quebec, taking over the Ontario construction industry. What does this mean for construction or refurbishment of nuclear plants? Are we at risk of dangerously sub-standard work?

What happens when the concrete cracks -- which I'm told is cracking already at Pickering? Is the Pickering plant about as safe as the Gardiner Expressway or a Montreal overpass?

I don't need to tell you about the lack of technology for disposing of nuclear waste and I hear that they're looking for a town desperate enough to take all that nuclear waste. They've thought of Hornepayne on the CNR's main line.

What will happen when a leak of radioactivity shuts down Hornepayne on the CN line, poisons a group of tourists on a Via Train or irradiates a freight train?

Consider the tritium leaks that occur at Pickering, though they're kept secret from the public. OPG will confirm that for you as they have in the past.

Lake Ontario is a source of drinking water for most of Southern Ontario. How will you replace that

water if you poison it? And why is it that Ontarians are declared to be safe, that radionuclide levels of 7,000 becquerels a litre while people of California are not safe at levels of 14.8. Are Ontarians somehow more resistant to the effects of radiation?

Yes, there are soccer fields and a children's beach and playground right next to the Pickering nuclear plant. It's great PR, as you've heard in the previous presentation, but is it safe?

I've heard that due to concerns about real estate prices, the Pickering politicians nixed a plan to place warning sirens in all the neighbourhoods. Notice they're only within 3 kilometres, I think, from what we've heard today -- because they're afraid of a drop of real estate prices.

And there's so much secrecy that we can't even get potassium iodide pills to protect our families. Potassium iodide protects against the effects of radioactive iodine, which is just one of over 200 radioactive isotopes released in a nuclear accident, but it's crucial to protect against thyroid cancer. I've lost most of my thyroid. I worked within range of the nuclear plant for years.

All of the Greater Toronto Area is at risk if there's a nuclear incident in Pickering. We're told

that taking potassium iodide will protect us, but have you tried to find any potassium iodide? I went to several Toronto and Pickering pharmacies, including the pharmacy that is just two buildings west of White's Road, and not one pharmacist even admitted to knowing anything about potassium iodide, let alone having any in stock.

I asked my doctor in Toronto, I even asked an endocrinologist in Toronto; I got no help or information at all.

Using the Durham Region Nuclear Information Brochure, I found that there are only four pharmacies and they're in Pickering, that distribute it. Durham region rules are that nobody living west of White's Road is eligible for it, however when I went and asked for some, I did get it.

Staff at the Toronto emergency office tell me that people living or working east of Morningside Avenue in Scarborough can go to their office and pick up some potassium iodide pills, however nobody knows this.

Toronto staff have no information on evacuation plans for anyone in areas between 10 and 30 kilometres from the Pickering plant. Only Emergency Management Ontario has that information and has not given it to the general public. And if you go to the Toronto Emergency plan, you'll see there's nothing about emergency

-- nuclear emergencies. It just says that Ontario is going to look after it.

Distributing potassium iodide after an accident is not possible. How are people ordered to shelter indoors to go out and get it? So this very fact that that's part of the plan shows the extent of the failure to adequately prepare for emergencies.

From what I've been able to find out, only schools and daycares east of White's Road have any stocks of potassium iodide. It means my grandchildren being in school just on the west side of White's Road and in daycare on the west side of White's Road are expendable.

And then there's the GE Hitachi plant in -- on Lansdowne Avenue in Toronto that takes the uranium powder in the middle of the city, turns it into pellets that are then put on trucks and taken to Peterborough, made into fuel rods and then put on more trucks and brought to Pickering.

Why don't you do it all here if you have to do it?

Along the way, there's a risk of contamination, whether from plant accidents, truck accidents or wastewater flushed into sewers.

And if nuclear plants are so safe, why are the operators not required to take all the risks in case

of breakdown or disaster? Why is their risk limited and why are taxpayers on the hook for the balance? I'll believe it's safe when the builders accept full liability for all damages of any kind whatsoever.

And I urge you to heed the lessons of Fukushima which, as we speak, continues to leak radioactive water. And there they learned about the importance of the 30-kilometre zone.

Nuclear plants are not valid alternatives with regard to greenhouse gases when you take into account all the embedded -- embodied energy that's in the building of the plant.

Long-range transmission lines are wasteful in terms of both construction and the loss of efficiency over long distances. Really, local production of energy is what keeps costs and energy losses to a minimum.

And right now, there's an excess of power in Ontario. I don't know why we need Pickering. We can't sell this excess power. We can't even give it away. We have to pay the USA to take it. And then I, as a taxpayer, am charged for that, to pay for the United States to take our power.

Nuclear is last century's technology. And just think of the clean environment we could have if all the money spent on nuclear were spent on renewable



resources. We'd have lots of green jobs to replace the nuclear jobs and everybody would be safer.

It's time for Ontario to enter the 21<sup>st</sup> century. Think about what this means for all of our grandchildren. I urge you not to renew the license of the Pickering plant.

And as an addendum I have a little song for you and some of my friends will join in.

(As sung by presenter):

"When we think of Fukushima, we have qualms. You're a target for those terrorists with bombs. There's no anti-nuke insurance which means there's no assurance that we'll not all be blown to kingdom come.

Bring us solar, bring us hydro, bring us wind. Bring us energy from sources that won't end. Before we could trust uranium, we'd need holes in our cranium, we haven't yet gone that far round the bend."

**THE CHAIRMAN:** Thank you.

**MS. CHUNG:** We grannies are very, very concerned about the situation.

**THE CHAIRMAN:** Thank you.

**MS. CHUNG:** Does anybody have any

questions?

**THE CHAIRMAN:** That's -- that's what I'm thinking about.

**(LAUGHTER/RIRES)**

**THE CHAIRMAN:** Anybody?

Dr. Barriault?

**MEMBER BARRIAULT:** Thanks, Mr. Chairman.  
On the issue of potassium iodide pills, have you approached Public Health at all?

Have they been of any help?

**MS. CHUNG:** Nobody's been of any help.  
Except I went to one of those four pharmacies -- since my grandchildren are in Pickering and I'm very concerned, I went to one of the pharmacies, got enough potassium iodide, because I babysit them every week, and I carry it with me when I come to Pickering.

**MEMBER BARRIAULT:** Okay. But  
Public Health offices ---

**MS. CHUNG:** Nobody will help me. Nobody has the information.

I called -- I talked to the Emergency Management Office in Toronto.

**MEMBER BARRIAULT:** Yes, this morning ---

**MS. CHUNG:** They didn't know.

**MEMBER BARRIAULT:** Thank you.

**THE CHAIRMAN:** Is there here more people still around here that somebody may want to shed some light on the availability one more time?

Yes? No?

I guess they're not here now.

**MS. CHUNG:** City Counsellors in Toronto don't know either.

**THE CHAIRMAN:** Oh -- please.

(SHORT PAUSE/COURTE PAUSE)

**THE CHAIRMAN:** I think, this morning, we asked you about availability, where it's available et cetera. Maybe you can elaborate as to what's the plan now into the future?

**MR. LEONARD:** Thanks, it's Warren Leonard for the record.

It's Durham Health that does distribute these on our behalf as required by the provincial criteria. They are in the four pharmacies. I'm glad to hear you did get them when you went to one of those four pharmacies.

There's five, in fact, but that also includes pharmacies for Darlington but we'll -- we're just here for Pickering today.

And certainly, the staff in my office are well acquainted with the distribution issues with KI and,

if you had called us, we'd be able to provide that for you.

**MS. CHUNG:** You're Durham; eh?

**MR. LEONARD:** We're Durham, yes.

And I think the fact that you've gone and got some for yourself is a testament to one of our premises of emergency management which is personal preparedness. We think that's a good approach and we make them available ahead of time for that very reason.

And ---

**THE CHAIRMAN:** I think ---

**MR. LEONARD:** --- I can only speak to -- for Durham.

**THE CHAIRMAN:** But I think the point here is: What happens if there's, on a national scale -- I was going to turn to staff: Does Health Canada have any role in distribution on more of a regional, national scale?

Anybody from staff or maybe OPG?

**MR. AWAD:** Raoul Awad, Director General of Security and Safeguard CNSC.

Health Canada have enough inventory to cover any request from any province.

**THE CHAIRMAN:** And how -- how does the public -- how is the public aware of that?

**MR. AWAD:** Actually, it's -- it's within

the Federal Emergency Plan to support the province in case of emergency and it's -- it should be available on Health Canada Web site.

**MS. CHUNG:** Do we all have to go to a Web site to find out?

And how many people even think of that? People are struggling just to make a living and they're really -- everybody has their head in the nuclear sand, so to speak.

Now, does everyone in Toronto have to come to one of these four pharmacies in Pickering to get potassium iodide and how are you going to handle that when we all come?

**THE CHAIRMAN:** But that's the question as to what happen in case of an emergency?

What people do -- people tend not to do -- not to care when there is no emergency.

So I think that's what everybody's struggling with and that's why the plan, as presented by EMO, is supposedly linked the local, regional, provincial and federal. And that's what we are trying to ascertain whether there is kind of a public information that everybody would know what to do.

**MS. CHUNG:** Yes, and the problem is, you know, I see in the Durham Nuclear Plan that, within four

hours, people will be at the -- the refugee stations and be given potassium iodide.

That's too late. You have to -- preferably, you take potassium iodide before you're exposed and you need to take it immediately. Four hours is too late.

People have to have it in their homes, in their possession, in their car, wherever they are when the nuclear incident happens and, if they don't take it right away, there's a decreasing -- like, after half an hour or an hour, it's 50 percent less effective.

So you're going to have an awful lot of thyroid cancer on your hands in the medical care. I suppose they'll delist thyroid cancer as something for OHIP, you know, the way they do.

**THE CHAIRMAN:** I'm not sure ---

**MS. CHUNG:** There's a real concern here.

**THE CHAIRMAN:** I'm not sure about the timing. I don't know if anybody knows when it -- when it's the effectiveness of when you have to take it.

**MS. CHUNG:** I researched it. It ---

**THE CHAIRMAN:** Please? We got some expert here.

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

I'll ask Dr. Sandor Demeter who's a practicing nuclear medicine physician who deals with thyroid treatments on almost a daily basis.

**DR. DEMETOR:** Sandor Demeter, for the record.

That is correct, the -- for prevention of uptake of radioactive iodine, it's -- potassium iodide tablets, a single tablet which is good for about 36 hours but you give it on a daily basis, is best taken if it's 6 hours prior to the exposure which gives you 98 percent protection when I looked it up.

If you take it the same time as the exposure, simultaneously, it's about 90 percent effective. If you take it 4-6 hours after the exposure, it's about 50 percent effective in blocking.

So, the -- in an ideal world, you would take it when notified an exposure is coming down the pike through an air emission or some other contamination. If that's not available, you take it at the exact same time as you may be exposed as possible.

It doesn't mean you don't take it after you've been exposed because there's still some as effectiveness but it is more effective if you can take it with a warning before the exposure.

**THE CHAIRMAN:** Thank you.

Anybody else for any question?

Questions?

So just a last question to follow-up on that point: So it means that the distribution of KI pills, if I understand correctly, has to be really well understood.

But what is the assumption that we are making? Will there be enough time in case of an emergency to deal with some of those bottlenecks? Let me characterise it that way.

Staff?

**MR. RZENTKOWSKI:** Thank you very much, Mr. Chairman. Greg Rzentkowski, for the record.

As you know, in the post Fukushima environment, we are discussing different doomsday scenarios and we concluded that -- that for Candu 6 reactors, it would be almost four days. Four days for any kind of preparation for the emergency response; and also this responds to the timing question with respect to KI pills.

Here in Pickering, because this is an older plant, let's assume a doomsday scenario which was rather unlikely before Fukushima and is even more unlikely after all improvements we put, post-Fukushima, in place to enhance the safety of the plan to the extent practicable -



--

There is approximately 18 hours -- before any kind of the release of radioactivity will take place at the Pickering site in the worst case scenario.

**THE CHAIRMAN:** Thank you.

Anything else? Any final words to us?

**MS. CHUNG:** Think seven generations.

**THE CHAIRMAN:** Thank you.

I would like to move on to the next presentation by Northwatch, as outlined in CMD 13-H2.123, 123A, B and C, and I understand that Ms. Lloyd will make this presentation. Please proceed.

**13-H2.123 / 13-H2.123A / 13-H2.123B / 13-H2.123C**

**Oral presentation by**

**Northwatch**

**MS. LLOYD:** Good morning, President Binder, and Commission Members. Thank you for the opportunity to make this brief presentation this morning. It is in accompaniment with our written submission and our supplementary submission.

As Commission Members will be aware, Northwatch is based in Northern Ontario and our concerns are primarily with respect to activities that have the

potential to affect the six federal districts of Northeastern Ontario: Cochrane, Timiskaming, Nipissing, Sudbury, Algoma and Manitoulin.

We have appeared before the Commission and predecessor tribunals on a number of occasions primarily related to operations in our region, the uranium refinery and the now decommissioned uranium mine tailings in the Serpent River Basin.

But matters related to the management of reactor wastes are of current concern in Northern Ontario, given proposals to bury both low and intermediate-level waste on the shore of Lake Huron and ongoing investigation of 12 communities in Northern Ontario and an additional six on the east coast of Lake Huron for the burial of high-level waste.

Northwatch is -- the generation of waste related to this particular application before you has two aspects.

One is the continued operations will increase the stockpiles of volumes of waste that must be managed over the long term.

But also, by extending the operating life of these ageing reactors, additional risk factors are introduced as a result of the ageing that, by our assessment, are specific to the fuel containers, to the

fuel bundles, and their long-term integrity, and so the ability of those bundles, as part of a multiple barrier approach, to isolate the waste from the environment into perpetuity.

So the wastes that are generated through operation include the low-level waste. Low-level waste, approximately, an estimated additional 200 million cubic metres per reactor-year would be generated by extending operations.

Intermediate-level waste, an estimated 67 cubic metres of intermediate-level waste, which are highly radioactive, would be generated as a result of extended operation, and high-level nuclear fuel waste, the irradiated spent fuel which is removed from the reactor after 18 months of operation, an estimated 16,000 additional fuel bundles for each year of operation.

And I'll note that these estimates were not included in any of the application documents. They are from other sources, and I think that in itself is problematic.

In addition to the noted issue of continued waste generation, there is the matter of increased risk to future efforts to isolate the waste from the environment.

There are some additional issues related to ageing certainly, but our focus has been specifically on

that issue which appears to be unaddressed by Ontario Power Generation, and even by Canadian Nuclear Safety Commission staff.

Additional issues that we'll address very briefly relate to effective ageing on reactor performance, effective reactor ageing on the post-operational periods, namely, the waste dry cask storage and the management of the waste.

Effective ageing on reactor station performance -- and we're going to touch only briefly on a few issues, but it's been identified that major effects of ageing relate to earlier onset of dry-out, feeder corrosion and roughness, and boiler tube fouling.

Ontario Power Generation does not prevent any information or indication of how they have analyzed potential effects of ageing reactor components on the integrity and the long-term performance of the fuel bundle, of the fuel elements themselves.

In their application, they do identify a number of instances of reactor station ageing related to leaks or seeps from the neutron poison, from the calandria tube, from the discharge line, tritiated groundwater from the irradiated fuel bay, chronic leaks of active water from the Unit 6 reactor foundation.

It's not clear in the application whether

these are specifically assigned to the effects of ageing, but I think it's reasonable to expect that additional failures -- failures will accumulate as the station moves beyond its design basis and continues to age.

We were particularly struck by the reckless flavour of some of the discussion, and in particular I'll note the discussion of potential vibration and that potential to cause cracking of the calandria tube, which is in OPG's application. And OPG says, it's to the effect of, well, they'll identify if it's susceptible, then they'll consider whether it's going to be examined, and then they might examine it.

That, to me, is -- that's reckless.

If there's the potential for cracking, without doubt they should all be examined. There shouldn't be consideration whether they're going to be inspected.

The effect of the reactor ageing on post-operational periods, we focussed in particular on the effect of reactor ageing on the function of the fuel bundle, the fuel elements, and the potential for failures of those being made much more rapid as a result of the effect of reactor ageing.

And we'll point to two items that were identified in the application material or the staff

documents.

One is the item of black deposits, which there was some discussion of in the Day One hearing. The black deposits on the fuel -- on the fuel element, identified as corrosion-related, there are many instances through the documents where corrosion is identified as an issue, which, again, it's not clearly established or clearly acknowledged that this is a result of reactor ageing, but I think it's fair to assume that it is.

The black deposits are increasingly frequent and the size of the deposits are increasing, up to the December 2012 report. It's corrosion related. It's a corrosion -- thought to be a corrosion deposit, but the cause is unknown.

Staff document indicates that it's thought that it is a deposit on surface -- a corrosion deposit on the surface and that the fuel element itself is not corroded, but I don't think that's clearly established.

The other item is element bowing and so the fuel element is -- and this was not, I don't think, identified in the staff documents, but in the report S-99 which also talked about the black deposit, it talked about the bowing of the fuel element, which is most -- which is potentially a result of uneven heat distribution. We found that in other technical documents, not in the

application.

So I think both of these, singly and in combination, increase the stress, the potential for damages to the fuel element, to the cladding and, as staff has identified in their documents, damages to the fuel cladding are a precursor to public dose.

As we go out over longer periods of time, any additional stresses, whether it's corrosion or cracking or bowing, any additional stresses and tensions on those fuel elements, on the fuel bundle, reduces its -- in all likelihood it will reduce its ability to act as a container to the radioactive products it contains, and so will result in a more rapid release to the environment, whether it's within an interim storage, within an onsite storage, whatever the centralized or non-centralized storage system will be, it will hasten that release, and that is a problem.

And that phenomenon has not been addressed by OPG in their documents; that there has been no evaluation of the effect of station aging on the integrity of the fuel bundles themselves over the long-term is a very large emission.

We did retain Dr. Ross Landsman to evaluate the dry cask storage on site. We've looked at the longer term storage, there are problems. We've looked at the

irradiated fuel base storage, there are problems.

The default then is to dry cask storage before we go down the road of saying dry cask storage is the option, we really needed to have an independent evaluation of dry cask storage.

Unfortunately, Dr. Landsman did not, in the end, after great effort on the part of CNSC staff and Northwatch to make documents available to them. His determination was that he did not have adequate description of the dry storage cask system as a system to be able to do a full technical evaluation.

He did say that in general terms, the cask design overall appears to be sound, but there were a number of outstanding questions that he had, which were obstacles to him being able to do a technical evaluation.

And I think that something that is very needed, given that the dry cask storage is quite likely going to be the default medium to long-term storage option for not just Pickering but for other stations.

In their documents, OPG identifies adaptive phase management, the nuclear waste management organization's program as their plan for the long-term management of the nuclear fuel waste.

Just in general, that's a problem because there is no site identified. The technical case, the



safety case has not been made at a national or an international level. There's -- no design has been developed. The design is still under development and social acceptance has not been achieved.

But more specifically, they identify 2035 as that date of availability. Well, when you add up the numbers, when you go through the nuclear waste management organization process, it's nine-step citing process and then implementation; the numbers don't add up to a 2035 implementation date.

If the waste is to be moved from the site to an NWMO facility in 2035, it is -- the only option that would be available, according to their outlines, would be a shallow -- what they call shallow cavern storage.

There are 21 communities being investigated as potential sites for a deep geological repositories; those communities are not being told that they are the site for a shallow cask storage.

There are references in the various NWMO documents to shallow cask storage. The most detailed description of it is in the glossary, it's been added to the most recent implementation plan. And in the glossary, it says:

"This is included (shallow underground storage facility) included in Adaptive

Phase Management as an option, should it be needed, to provide a contingency in the event of unplanned circumstance."

OPG say they are sending it at -- in 2035, but the options available in 2035 is not an unplanned circumstance.

So I think in summary, they have not addressed, you know, by any credible means, their long-term management for the fuel waste.

The decommissioning plans, to summarize, because I know I'm running out of time, Dr. Binder, I'll just make one note on the decommissioning plans.

Ontario Power Generation, in their documents, states that decommissioning low and intermediate level waste will be disposed of at a regional disposal facility located in Ontario, approximately equidistant from OPG's five nuclear stations.

I keep counting them up and can't come to five stations. So maybe OPG can help out with that.

But I also have -- there is no identification of where this disposal facility is. I did send an information -- I sent an email -- an inquiry by email to OPG in April and have received no response.

If it's equidistant of the three stations

that I know of, it puts it somewhere around Markham -- between Markham and Orangeville. And it must be in the very early stages of planning.

Planning for extended storage: I think to summarize, after several decades and failed attempts, there is no geological disposal repository on the near horizon, which has resulted with a couple of other factors in a number of jurisdictions, looking at extended onsite storage, generally in the one to 300 year timeframe.

Post-9/11 security concerns have added to that and certainly following the Fukushima crisis, which began in March 2011, the need to look at extended storage has been, I think, amplified.

Some of the features of extended storage are that it is -- three features are that it is passively safe that the facility is hardened, that the fuel waste are dispersed and the feature of passive safety is key in making the waste more secure from human or operational error or natural events.

And, inarguably, there are benefits to taking a planned approach to extending onsite storage rather than simply having short term or interim storage become the de facto option.

So in conclusion, OPG should be denied their application. Unit 1 should not resume operations.

The bowing of fuel elements, which was reported in December 2012, should be investigated and that investigation should be OPG station-wide across, the three stations which OPG owns, two of which they operate.

And the Commission should convene a roundtable with licence review intervenors to consider means to improve your system of information provision.

Thank you.

**THE CHAIRMAN:** Thank you.

**(APPLAUSE/APPLAUDISSEMENTS)**

**THE CHAIRMAN:** It's open, who wants to go first?

Monsieur Harvey?

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

Well, like it has been said, and we will hear that all along, the OPG Pickering is among the oldest plants, surely in Canada, maybe in the world, and will be operated over the design life. So many concerns expressed by Ms. Lloyd are legitimate.

And my question will be addressed to the staff because many data today, reports, have to be completed or are being completed; management system, human performance, operating, et cetera and my question is, how the staff will monitor that.

I will formulate my question in other words. What will be different for Pickering that is not normally applied for other nuclear station in Canada? What specific measure will be applied to Pickering?

**DR. RZENTKOWSKI:** Thank you for this question. Greg Rzentkowski, for the record.

There are two new elements, which we applied for the regulatory oversight of Pickering A and B. It's a continuous operation plan -- continued operation plan, which is to demonstrate fitness for service of the pressure tubes until 2020. This plan is applicable only to Pickering B.

In addition, we have a sustainable operation plan to make sure that the operation of the plant will be as safe as it was over the years until the end of the commercial operation. So that means 2020.

A sustainable operation plan is this place where all the programs converge together into a very cohesive approach to the safe operation of the plant. So those are two new elements.

**MEMBER HARVEY:** How will, as a Commission, will be informed of the progress or of the problems and how the public would be informed?

**DR. RZENTKOWSKI:** Yes, of course, we have the NPP annual report, which is a mechanism to report not

only to the Commission but also to inform the public about the safety performance of all nuclear power plants in Canada, including Pickering A and B.

**MEMBER HARVEY:** What about the hold points; how many hold points do you have, because you are asking to delegate the authority to the staff for this hold point.

**DR. RZENTKOWSKI:** In the case of the proposed licence, we suggested only one hold point, and this hold point is required to completely evaluate the new safety case supporting continued operation of Pickering B reactors.

And I think we scheduled release of this hold point for June of 2014, assuming that the research and development project will produce the results which will allow us to allow for continued operation of the plant.

**MEMBER HARVEY:** Merci.

**THE CHAIRMAN:** Dr. Barriault?

**MEMBER BARRIAULT:** Thank you, Mr. Chairman.

The issue of the black spots on the fuel bundles that led to the de-rating of the reactor by 3 percent, do you have an analysis of exactly what is causing this? Do we know what's happening and has it happened at other reactors, other fuel bundles?

Perhaps OPG could answer to that.

**MR. JAGER:** Glenn Jager, for the record.

Before I ask Mr. Carl Daniel, our Director of Engineering, to comment in more detail, I would like to say that when we -- when inspections first revealed the deposits, an evaluation was done at that time, as well as an inspection of the fuel, and did not find any effects on the fuel as a result of the deposits.

As well as the safety -- potential safety consequences and the effects of the deposit on the fuel was also evaluated, which Carl will speak to.

The performance of Pickering, all six reactors are operating fuel defect-free, which is at industry excellence in terms of fuel performance at the moment.

So I'll ask Carl to discuss the mechanism, what's causing the deposits, and the corrective actions that we're taking.

**MEMBER BARRIAULT:** Thanks.

**MR. DANIEL:** Carl Daniel, for the record.

The source of the deposits is the corrosion of the carbon steel itself within the heat transport system. Small amounts of corrosion are part of the operation of the plant. The corrosion rates themselves are minimal and we continually monitor for changes. Those

changes are very, very small.

The deposits on the fuel are magnetite. They are not from the fuel itself nor are they from the reactor components or the pressure tube.

We have, as Mr. Jager said, looked at both bundles from the discharge from the reactor over a number of years. We have not found any damage to the fuel sheets itself as a result of the deposits on the fuel, nor do we predict that if the deposits were any thicker we would see any damage to the fuel itself.

We've done extensive examinations of a large number of bundles. We have not seen any physical damage to the bundles, including any bowing.

**MEMBER BARRIAULT:** Thanks.

Could I ask CNSC staff to comment on the level of deregulation by 3 percent? If the contamination increased, do you deregulate even less than that, will you take it to 6 percent, 10 percent, whatever?

**DR. RZENTKOWSKI:** Greg Rzentkowski, for the record.

We decided to derate the reactor by 3 percent in December of 2012, in response to the information received in the S-99 report.

There were two pieces of information there. One, it was increasing occurrence of the black deposit on



the fuel bundles, and second was potential bowing of one of the fuel elements. So this was the main reason for de-rating the reactor.

Since Unit 1 was returned to service, I believe, in February of this year, OPG put some corrective measures in place. The first one was that the upper limit on the heavy water pH specification was increased to 10.5 to encourage normal operation at higher pH than the historical average of 10.2.

The objective of this change was predominantly to promote the dissolution of pre-existing fuel deposits while maintaining heat transport system flow accelerated corrosion and iron transport at acceptable levels.

And, in addition, bundles from several channels, average of four bundles per week, were set aside for inspections. Until now, eight bundles were inspected. The inspection results showed relatively small deposits. More importantly, the black deposits from one of the bundle discharge appear to have partially flaked off.

So that means that measures taken by OPG appear to provide right conditions for controlling this ageing mechanism and maybe even reversing the trend which exists in the primary heat transport system.

There was also one more piece of

information we wanted OPG to confirm that, in fact, those bundles with the black deposits are coming predominantly from low power channels where the flow velocities are the lowest and this allows for the deposit to form itself on the surface of the bundles.

And up to this point in time, this has been confirmed but of course we are waiting for more inspections to make this conclusion statistically more meaningful.

**MEMBER BARRIAULT:** So if I understand correctly, the black deposits are getting less and less with the control measures?

**DR. RZENTKOWSKI:** That's correct but how I indicated, we need more data to make this conclusion statistically meaningful before we will take any regulatory action, which could be return to full power operation of the unit.

**MEMBER BARRIAULT:** Thank you.

Thank you, Mr. Chairman.

**THE CHAIRMAN:** Can I just follow-up a little bit on this so I can understand it in layman language?

You're still not -- maybe it's to OPG also; you're assuming that you understand how it happened and why, but you're still collecting data to try to understand

the root cause.

Let me understand; and in the meantime, you de-rate it by three -- I'm interested to know why three; why not four, why not two? How did you calculate that?

And does that mean that gives you -- by de-rating by 3 percent gives you a bigger margin of safety that you're comfortable with until you know precisely what the root cause is?

Did I get this right?

**DR. RZENTKOWSKI:** Yes, that's a very good summary.

And actually I didn't explain one very important point, which was the trigger for de-rating the reactor.

It wasn't really the black deposit, because how I mentioned, the black deposit came from the low channel powers when approximately 50 percent margin to fuel dry out exists. But the bowing of one of the elements was really the trigger, because if there is a bowing that means we could be, eventually, close to the dry-out of some of the bundles somewhere in the system.

By reducing the power by 3 percent, we know that we will open up the safety margins until this phenomenon would be confirmed.

So we requested OPG to send this fuel

bundle to Chalk River Laboratories for close examination. The close examination revealed that, as a matter of fact, there was no bowing. This was just a visual assessment of a bundle in the irradiated spent fuel bay that indicated bowing but, in fact, there was no bowing of a fuel element.

This tells us that the problem exists but it's probably not as severe as we originally assumed.

**MS. LLOYD:** And Dr. Binder, if I could ask then, where is that documented? How long has staff known that? Why is it not in the supplementary?

I mean this doesn't give me really any greater comfort that they thought it was bowing and now it's not bowing, they just looked at it wrong.

**THE CHAIRMAN:** Go ahead.

**DR. RZENTKOWSKI:** Again, it was a very precautionary measure on our part. There was a visual indication that one of the bundles may experience bowing in the reactor core. So we sent it for a detailed metallurgical examination and it confirmed this not to be the case.

The results we received very recently. I will ask Miguel Santini in a moment to define this more clearly, but the inspection results, I referred to, that some of the deposits started flaking off is really coming

-- stemming from the last week report. Which we received from OPG.

**THE CHAIRMAN:** But in terms of reporting on all those things, the next time you do an NPP summary will be in August?

**DR. RZENTKOWSKI:** In August, that's correct, but ---

**THE CHAIRMAN:** So there will be an update of all -- what's going on?

**DR. RZENTKOWSKI:** We will make this update on the presentation because, of course, the report has to finish at the end of April in order to be prepared for publication. So we are not updating the information in the NPP report anymore, but we will update our presentation. The presentation will be as recent as possible.

**THE CHAIRMAN:** Thank you.

Ms. Velshi?

**DR. RZENTKOWSKI:** Miguel Santini only wanted to define specifically when we found out about the status of the bundle.

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

We were informed of the no bowing of the elements not long after the initial report of these

deposits. When these will be wrapped up, all of the information will be packed together at the time that we release the penalty of 3 percent and then is when the documents will become official from the CNSC.

**THE CHAIRMAN:** Ms. Velshi?

**MEMBER VELSHI:** This is still following up on the black deposits.

Is that an aging issue or was it just a chemistry issue?

**DR. RZENTKOWSKI:** It's predominantly a chemistry issue for, the deposit to form itself.

It's also an aging issue because this is an erosion of the heat transport system piping and, particularly, the feeder pipes. This is a part of the system feeding the flow from the inlet header to the fuel channels.

**MEMBER VELSHI:** So changing the pH are we then likely to introduce additional problems down the road?

**DR. RZENTKOWSKI:** I don't think this will be the case because the change was very small and it just happened that pH acts as a component which may accelerate flow erosion and once you change pH a little bit, this problem may not manifest itself as strongly as it has in the past.

But, of course, further observations will be required and close inspections will be required from OPG even after they return to full-power operation.

**MEMBER VELSHI:** Thank you.

And some of the other issues that Ms. Lloyd raised, I ---

**THE CHAIRMAN:** Can I interrupt?

I'm still on black deposit.

**MEMBER VELSHI:** Okay.

**THE CHAIRMAN:** So I'm still on black deposit.

So if you're going to monitor it, okay, on an ongoing basis -- I'm still fascinated about the chemistry or the aging and all that stuff -- are you now going to increase the frequency of inspection?

Can you actually inspect all the bundles and find out if there is any irregularities, spots, bowing, if possible?

And if so, can you do it more frequently because it's a more aging -- you know, it's -- if you increase age, you do, I assume, your more frequent inspection and take action should something happen?

I'm trying to come down to the safety level. So if something happened and you inspect it, you always have the option of the de-rating again; is that

correct?

**DR. RZENTKOWSKI:** Yes, this option always exists and we exercise this actually quite frequently.

**THE CHAIRMAN:** So are you going to increase the inspection frequencies?

**DR. RZENTKOWSKI:** Yes, the frequency of the inspections has been increased already.

I don't know statistically what is the population of the channel inspected. So we may eventually pose this question to OPG.

**THE CHAIRMAN:** So, OPG, are you doing anything?

**MR. JAGER:** Glenn Jager, for the record.

When the condition was identified, we did a number of things. One is we carefully documented an evaluation of the condition to look at it from the safety perspective. The second thing is we looked at the causes of the black deposit and evaluated that and that's how we came up with the pH adjustment to correct the condition; and now we're inspecting to ensure that the corrective measures have been effective and will arrest and reverse the condition.

We have an inspection program for all the fuel that's being discharged out of Unit 1 that looks at a representative number of bundles that exit the reactor.



Then I'll ask Carl Daniel exactly how much that constitutes but, generally, that inspection regime, we have a work down that takes us to July to look at sufficient bundles and we're looking at pretty much all the bundles from different regions of the core to fully confirm that our corrective measures have been effective and also determine if there's any further action that we need to take in regards to heat transport chemistry.

And I'll just ask Carl to talk about the number of channels that we're looking at and where in the core and the phenomenon overall in terms of how the mechanism takes place and why we chose a pH change to correct that.

**MR. DANIEL:** Carl Daniel, for the record.

So a couple of points. First of all, that the bundles, themselves, we have a plan ---

**THE CHAIRMAN:** Can you bring the mic closer to yourself, please?

**MR. DANIEL:** Sorry.

Carl Daniel, for the record.

First of all, from the point of view of the deposits and the pH, the pH changes that we've been making are very slight. They will -- they are an optimization as to where the deposits will form; whether they'll form on the bundles or whether they'll move into the system

themselves.

We've also increased our purification rates which will remove deposits from the system which will also help clean up the bundles.

We have a plan to look at bundles discharged from all of the units, not just Unit 1. Unit 1 itself has a work down curve to look at bundles and we've already started that as Unit 1 returned to service about a month ago.

It does take about a month for us from the time we discharge bundles to the time we can look at them in the bay and then that's why the first data is just coming out of the unit now.

**THE CHAIRMAN:** Thank you.

Ms. Velshi?

**MEMBER VELSHI:** Thank you.

So two follow-up questions to OPG from what we heard from the intervenor.

One was the questioning of the waste volumes that have been presented by OPG. Do you want to comment on that?

I think one of them was that the waste produced during the safe-storage phase was not included in the volumes that you publish and I -- there may have been another one -- source as well.

**MR. JAGER:** I'll ask Jerry to -- Jerry Keto to -- the Director of Waste and Storage to comment in more detail about the provision for waste management.

I would say that, for the Pickering site, we're keenly aware of the waste that we generate and adequate provision for the storage of waste and maintenance of storage exists for the operation of the plant right through to 2020 and beyond.

As well as, we look at a number of waste-reduction strategies that we have employed over the years and continue to improve upon to reduce the burden on the storage and we have an employee-driven green team, for example, that looks how waste is generated and minimizes the amount of waste produced by the facility overall.

So we are working to minimize the burden. The facilities that we have in place are adequate for the safe storage of waste for the facility right through to 2020 and beyond and I'll ask Mr. Keto to comment in more detail about the provision for waste storage.

**MR. KETO:** For the record, my name is Jerry Keto. I'm Director of Nuclear Decommissioning for OPG.

With respect to the incremental waste volumes resulting from extending the life of Pickering out to 2020, I would respectfully offer a correction to the intervenor who estimated it at 200 million cubic metres.

Our DGR Repository is being sized for 200,000 cubic metres for all of the company's operational and low-level waste. So the incremental increase typically per unit as we extend the life of Pickering would be on the order 200 to 300 cubic metres per unit.

The DGR that we're currently in the licence application process with is sized to accommodate this additional waste, so its current size of 200,000 cubic metres will be adequate to store the incremental increase in low and intermediate-level waste.

**MS. LLOYD:** If I could, in our submission and certainly what I thought I read from my speaking notes was 200 cubic metres per reactor unit per year in low-level waste which I think is consistent with what you've just said so I'm not understanding how he's correcting me on that unless I added several zeroes when I spoke.

But I think the point that I made more was that the decommissioning waste aren't in the reference inventory for the DGR and OPG identified in their document, in their application, that there will be a decommissioning facility central to the -- equidistant to their five stations; I can only find three.

**MEMBER VELSHI:** And that was my question.

So it is on page 17 of CMD H2.123B and it really does say the inventory of waste from the safe-

storage phase has not been included. It has been inventoried for the deep geological inventory.

And that's what I was asking what OPG's comment was: Has it been included and, if not, why not?

**MR. KETO:** Jerry Keto, for the record.

I'll answer that. The waste volumes expected during the safe storage period are about 2 percent of the overall waste -- operational waste volumes estimated from Pickering, and the current DGR size can accommodate that.

**MEMBER VELSHI:** And the decommissioning waste?

**MR. KETO:** For financial planning purposes, we had to make some assumptions as we were estimating the decommissioning waste.

And under that, we -- what we did is we had to assume that the waste from decommissioning was going to go somewhere and, for financial planning purposes, we had to assume a DGR somewhere in Ontario.

Now, with the DGR that we are currently in the licence application process with, the EA and the hosting agreement have specific language in there that prohibits decommissioning waste from going in this DGR, but does open the door for expansion in the future, if OPG wishes to use that DGR for its decommissioning waste.

**MS. LLOYD:** And so, if -- just to be clear, the decommissioning facility you are referencing does not exist. You have no plan, you have no site, unless it's to expand the DGR currently proposed by OPG underneath the Bruce Nuclear Generating Station which, in its current discussion, excludes decommissioning waste.

So this is largely an imaginary facility that you have referenced?

**MR. KETO:** Jerry Keto, for the record.

I wouldn't call this "imaginary" necessarily. We had to make financial planning assumptions in order to ensure that OPG set aside enough money to properly dispose of this waste.

**THE CHAIRMAN:** Okay, staff, you want to clarify something here or can you clarify something?

All I know is two DRG are -- work right now and that is complicated enough.

Are those two DGR not sufficient to solve all waste of all facilities in Ontario? At least?

**MR. RZENTKOWSKI:** Yes, Greg Rzentkowski, for the record.

So in this case, I would defer the question to Mr. Don Howard who is the Director of the Waste and Decommissioning Division to describe our waste program and our strategy.

**MR. HOWARD:** Don Howard, Director of the Waste Decommissioning Division.

Yes, as far as the low and intermediate level waste, DGR that is planned by OPG is for operational waste.

And I concur with the Ontario Power Generation statement that, right now, decommissioning waste is not planned for the DGR, but there are provisions in the hosting agreement with the local community that, in the future, that could be a possibility.

So where do we stand today? Is that we have on the low and intermediate level waste for operational waste from Pickering, Darlington and Bruce going to the DRG.

The Nuclear Waste Management Organization has a project underway to find a willing and host community for a repository for high-level waste, meaning spent fuel.

And as far as decommissioning waste? Right now, there is no home.

Other than, from a regulatory requirement, is that OPG, when it comes time for decommissioning, must demonstrate to us or provide to us, information on how they propose to manage safely all decommissioning waste that will be produced in the short and long term.

So they must come up with that plan prior to decommissioning.

**THE CHAIRMAN:** Ms. Lloyd?

**MS. LLOYD:** And that plan is one sentence:

"Decommissioning of low and intermediate level waste will be disposed of as a regional disposal facility, located in Ontario, approximately equidistant from OPG's five nuclear stations."

So I think we can call that the Orangeville DGR.

**MR. CHAIRMAN:** OPG?

**MR. KETO:** Jerry Keto, for the record.

Again, that statement in its proper context was used for financial planning purposes so we ensured that we set aside enough money for transportation of this waste.

**MS. LLOYD:** It does not read like that. It reads like: Ontario Power Generation has a plan. It is for this facility which is equidistant from their five stations -- and they don't have a plan.

Not only did they not provide you with a decommissioning plan, they are referencing a disposal facility which does not exist.



They do not have a plan, they do not have a location. They have an idea that they need to say something to you about having a plan and so they have said that.

And it is completely unacceptable. It should be unacceptable to you. It is certainly unacceptable to us and I'm sure to the people of Orangeville.

**MR. JAGER:** Glenn Jager, for the record.

**(APPLAUSE/APPLAUDISSEMENTS)**

**MS. LLOYD:** Or Markham, or wherever.

**MR. JAGER:** There is -- again, there is adequate facilities and storage for the operation of the Pickering site. We do have funds set aside and plans in place to develop long-term storage.

There would be public consultation -- and I am sure in front of the Commission -- when those plans are brought forward in order to establish those facilities.

But in terms of the operation of the Pickering site, there is adequate waste storage, we have adequate capacity, it is safely managed and in place for the operation of the Pickering site right through to 2020.

**THE CHAIRMAN:** Thank you.

Ms. Velshi?

**MEMBER VELSHI:** My second question was

again to OPG around the technical evaluation of the drag cask storage that seems to have been stymied because of not having access to required information that the intervenor wanted.

Can you comment on that, please?

**MR. JAGER:** Again, I'll ask Mr. Jerry Keto to discuss about the use of the dry fuel storage and the inspection requirements and how we are managing that going forward.

**MEMBER VELSHI:** Sorry, that wasn't what I was asking.

What I really wanted to know was: Was there information that was requested that was not provided?

**MS. LLOYD:** If I could?

If you look in Appendix 1, you will have the listing of reports that Dr. Landsman did review.

The way this played out is that we requested documents. It frequently took some time to get the documents, but the documents -- then when we would get them -- would not have the discussion, would not have the technical descriptions that Dr. Landsman required to do a full evaluation.

So we went back and forth, we, you know, Commissioned staff, put a great deal of time into this.

OPG did provide documents that we requested. It took some time, every step took some time.

But, in the end, Dr. Landsman still did not have what he felt was the technical description required to do that evaluation.

So I think we are going to try to come back at this again for the waste management facility relicensing because I think this is a really important evaluation that needs to be done.

But this time -- we did start last year asking for the documents and I think that it's -- you know, it really is what is behind our recommendation: That the Commission convene some kind of a round-table discussion around: How do intervenors or other members of the public access documents?

I think staff puts, you know, -- not meaning to speak on staff's behalf but I think your staff spends a lot of time responding to information requests and there may be a better means to deal with it.

So in terms of -- we did get most of the documents we requested, we did not get the preliminary decommissioning plan which we requested for the waste management facility. We will be doing some additional work on that.

But the way it worked out is, each document

we got, we still didn't -- led to identifying that it is not there. We will ask for something else and, in the end, we did not get the technical description that Dr. Landsman required to do an evaluation that he felt was really based on solid, detailed, description.

**MR. CHAIRMAN:** Mr. Jammal?

**MR. JAMMAL:** Thank you, Mr. President.  
Ramzi Jammal, for the record.

The intervenor is raising a lot of good questions on what is the plan versus the decommissioning activity.

I would like to clarify two things: We request the licensee and the operators to put in place a plan. A decommissioning plan. Now, when it comes to go towards decommissioning, decommissioning is a licensed activity that the Commission will have to hear on its own as a standalone licensing process which would involve, just like here we're talking today, the public hearing with respect to the renewal of the licence, the decommissioning activity, way before it starts, we'll take in consideration the public input and the hearing and the assessment of staff.

So there is -- we require the licensee to put in place a plan. It is a plan for the long-term aspect, and as it comes closer to the end of commercial

operation and safe storage and decommissioning activity, the Commission has the process, the licensing process, that pertains to the decommissioning.

With respect to the waste and decommissioning, even though we're not discussing the DGR in details here, and that's not the purpose of this hearing, the decommissioning is considered to be cumulative effect, and with respect to the DGR process itself, the environmental assessment has taken -- we'll be taking that in consideration as in decommissioning.

But there is a waste production based on the operation, and then on the long-term aspect, as decommissioning activity becomes a standalone activity through the licensing process of the Commission, there will be public hearings addressing the licence activity for decommissioning.

I just want to make this very, very clear, that it's not -- even though there's a plan, it does not circumvent the CNSC process and the Commission process to conduct a public hearing and a discussion with respect to decommissioning.

**THE CHAIRMAN:** Anybody else?

Dr. McDill?

**MEMBER MCDILL:** Thank you.

With respect to the dry storage containers

and the documents that haven't been provided -- or the information that hasn't been found, perhaps would be a better way of saying it, to OPG and then to staff to fill in, in terms of the metallurgical environment -- I'll just go to the two that raised here by the intervenor.

In terms of the metallurgical aspects of carbon steel versus stainless steel, in an evacuated environment, is this something that is -- should be of concern in terms of packing and unpacking? Is this something that should be of concern?

**MR. JAGER:** Glenn Jager, for the record.

First of all, I'd just like to apologize to Commissioner Velshi for not understanding the question.

We will have to look at the requests made and what was provided. We'll provide an answer later today perhaps, on that issue.

And regarding the dry fuel storage cask composition and inspections and integrity, I think you were asking, I'll ask Hermina Roman to comment on that.

**MS. ROMAN:** For the record, my name is Hermina Roman, Manager of Nuclear Waste, Safety Assessment and Licensing.

In terms of the type of steel, I know that that's been a bit of a debate, if carbon steel is as good as stainless steel. OPG has chosen carbon steel

specifically because after investigating corrosion, cracking, as well as hydrogen embrittlement, and blistering, carbon steel behaves much better than -- for those aspects of the behaviour of the steel, better than the stainless steel or any other type of steel, so that's why they've chosen carbon steel.

In addition, the dry storage containers are coated with a very hard coat of paint that avoids the corrosion mechanism to start. As well, we don't -- we dry -- vacuum dry the containers inside, so there is not that possibility of getting any of this hydrogen production.

In addition, in the strength of the container, although the dry storage container is not a pressure vessel container, OPG have chosen to inspect and manufacture these containers as such, and therefore we maintain the N285.8 pressure vessels for any pressure vessel containing nuclear material.

So we maintain that as well as they ask me -- or inspection, the CSA standard for the inspection of pressure vessels.

**MEMBER McDILL:** Thank you.

In terms of packing and unpacking?

**MS. ROMAN:** Hermina Roman, for the record.

The standard requirements for the dry storage container is that -- is the waste's retrieval.

It's able to be retrieved in the same way as we load the container.

It's true that we haven't done it yet. We have a project in place right now to develop the right mechanisms to open up, that's it, to remove the well, which is quite a bit of a well. And that's ongoing, so we will develop this mechanism.

And then from there on we would move the DSE, retracing the steps that we do, from loading to processing, so we will go back to the fuel base to unload.

All that will be done with the right approvals from the CNSC and the safety assessment in place prior we do any of this on -- with real dry storage loaded with fuel.

**MEMBER MCDILL:** Thank you for that commentary stuff.

**DR RZENTKOWSKI:** Thank you. Greg Rzentkowski, for the record.

We would like to clarify two points. The first one is on the release of information, on those two reports. Mr. Miguel Santini will provide more details.

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

Effectively, we received a long list of documents, most of them owned by OPG, from several



intervenors. Because of -- most of these documents contain proprietary information, we are obligated by law to check with the owners of the information.

In this particular case, most of these reports are proprietary, and if OPG believes that the commercial value is enough not to grant release, then it is their call, with a second determination.

Basically, for the license application, related documentation, we use a process that is parallel to what our ATIP processes, so the filtering is done through the ATIP officer.

It is important to note that all licence applications and related documentation has lots of proprietary information that cannot be publicly shared, because if we -- if the licence application consisted only of documents that are publicly released, then we will not be able to fulfill our obligations on the Act -- under the Act, to review the application.

With respect to the review of the dry fuel casks and the chemistry aspects on the packaging and unpackaging, I would like to ask Don Howard to answer the question please.

**MR. HOWARD:** For the record, Don Howard.

The dry storage containers that OPG uses were assessed by the CNSC staff for its robustness and its

capabilities to safely store the spent fuel.

Our conclusions were, at that time, that the dry storage containers were robust and they provided the safety aspect for the storage of the spent fuel.

One item that OPG did not mention is that these containers, they'll helium-backfilled so, in other words, there's an inert gas that is put in, helium, into the cavity of the container for corrosion aspects.

As far as retrieval, is that one of the regulatory requirements that we went to OPG with, is to retrieve the spent fuel if a container were to fail. And so, basically, they indicated that they -- that they can reverse the process and do the work.

So we've asked hem to demonstrate that, so now we're in the process that OPG is putting the plans together to demonstrate that they can retrieve spent fuel from a dry storage container.

**MEMBER McDILL:** Thank you.

Could I ask OPG one more question? With respect to the carbon steel versus stainless steel, was that information published in a peer-reviewed journal or was this independent study done within OPG or OPG's contracted metallurgical labs?

**MS. ROMÁN:** Hermina Román, for the record.

I don't know exactly what type of document

behind because there were numerous documents that we produced when we were developing the design of the dry storage container.

So I will have to go back and -- but I am sure it is at the back of our technical specifications for the dry storage container. But I'm not sure if it was published in any public information or conference or anything like that.

**MEMBER MCDILL:** Thank you.

You could perhaps understand the frustration of an intervenor who is trying to get that information and is unable to. I understand the proprietary nature of many things.

Thank you.

**THE CHAIRMAN:** Just to follow up on this, I understand that staff is reviewing what is releasable when we make reference, particularly in our CMDs. There's been an issue with the Canadian Standards Association, for example, and I think staff is trying to find a way, as you suggested, to make any reference releasable and challenge the natural inclination to stamp everything proprietary.

So we hear you, we understand the issue and I think it's now being reviewed.

Anybody else? C'est fini?

Okay. Nobody talked about the vibration

that was treated "recklessly". I can't let that go unaddressed. So who wants to start? Staff.

**MR. RZENTKOWSKI:** Greg Rzentkowski, for the record.

I believe the reference to vibration is in relation to excessive pulsations inside the fuel channels, which can manifest themselves as the vibration of the channels themselves.

So there is normal turbulence present in the fuel channel because the flow - at each discontinuity in the system; will de-attach itself and then reattach again approximately five to 10 diameters of the piping downstream. And this is causing a significant level of turbulence, which can translate itself, because there's a lot of random energy, into vibration of the piping.

Another phenomenon, which is quite know in CANDU reactors, is acoustic excitation. This is also related to random turbulence because the turbulence can be picked up acoustically; like an organ pipe amplification because those tubes are quite long, quite narrow. So they can act like organ pipes and they can tune themselves up to some of the natural frequencies which are present in the system.

But the most dangerous, really the most dangerous one is when the system can acoustically tune

itself to the blade passing frequency of the primary transport pumps because the primary heat transport pumps can generate a quite significant pressure pulsation, approximately 10 kPa at the blade passing frequency, which is either 150 hertz for five-blade pumps or 210 hertz for seven-blade pumps.

This pressure pulsation can be acoustically amplified in the inlet header or one of the fuel channels. The latter is a very dangerous problem for the integrity of the fuel channels. And we are very aware of that fact this is closely being monitored.

I can assure the intervenors that acoustic excitation is not a problem at the Pickering station. Any vibration which is present is strictly related to the turbulence, and this is a relatively benign problem.

**MS. LLOYD:** I don't really do reactors. So I'm going to perhaps leave that for some of the other public intervenors.

As I read the document, it was an issue of loose fitting gear springs, the potential for that then to cause vibration and the cracking of the calandria tube. And the response, as I read it, was that they identified some that are susceptible and so on.

I'm going to leave it to Commission Members and other intervenors perhaps to follow up on that. I

didn't actually hear in that response a discussion of the items that I raised but that's perhaps because I'm not really a reactor person.

**THE CHAIRMAN:** OPG, you want to say anything about that?

**MR. JAGER:** Glenn Jager, for the record. Mark Elliott will discuss that in more detail.

**MR. ELLIOTT:** Good morning. Mark Elliott, Chief Nuclear Engineer, for the record.

The issue that's being discussed is an event on Unit 7 of Pickering where a calandria tube, a small calandria tube leak developed. And this was a small leak of carbon dioxide into the moderator system.

The calandria tube is not part of the heat transport -- primary heat transport system. It's part of the moderator system; so it's a low temperature, low-pressure system. And it developed this small leak and it was detected by CO<sub>2</sub> going into the moderator system and we detected it through chemistry.

The root cause, we found that the root cause of that was the garter spring that separates the pressure tube from the calandria tube was vibrating against the calandria tube and, over a long period of time, there was wear on the pressure -- wear on the

calandria tube and wear on the garter spring and a hole was -- a small hole was put in the calandria tube.

This is something that has not been seen in CANDU anywhere else. We think it's a unique situation and the way we deal with that is that any leak like that would be quickly detected in the chemistry of the moderator, would not affect fuel cooling.

We've looked at it from a safety point of view that there is a safety function of the calandria tube in certain accidents. That safety function would not be affected by a very small leak, a very small crack in the calandria tube.

So it's something that occurred. It was unique. We think we understand it and is not a safety issue.

**THE CHAIRMAN:** Thank you.

Just my last question: how long are the bundles in the pool? I thought that normally it was kind of -- your policy is eight to 10 years, but after Fukushima, I thought there was an agreement that need to speed up.

Is that being implemented? What's the current practice?

**MR. JAGER:** Glenn Jager, for the record.

That's correct. The discharge bundles

spend about eight to 10 years in the wet storage before they are then transferred to dry storage.

We have begun an accelerated movement of fuel from the fuel bays into dry fuel storage. This is in preparation for safe stating the units following 2020 to ensure that they're adequate bays' basins as well.

Quite frankly, it's a safer place to be to have the fuel out of the bays into the dry fuel storage in terms of long-term storage until decommissioning.

I'll ask Mr. Keto to comment on any improvements we're making in terms of reducing that amount of time and accelerating the transfer of the fuel to dry fuel storage.

**MS. ROMÁN:** Sorry, I'll take the question. Hermina Román, for the record.

The basis for the dry storage is for the fuel to be in the fuel bays presently for 10 years before it is moved to dry storage.

However, presently, as has been mentioned, after Fukushima, we have ongoing project to look at the safety case for the fuel to be moved into dry storage down to six-year-old fuel, but that's ongoing. There has to be a study and it has to be approved by the Commission that that can be a change to our certificates.

**MS. LLOYD:** If I could.



**THE CHAIRMAN:** Okay, thank you. Last few comments.

**MS. LLOYD:** I'm pleased that OPG agrees with Northwatch that the way should -- the irradiated fuel should be moved from the wet storage to dry storage sooner. I don't have a number specific to Pickering, but overall, in OPG's operations, 75 percent of the waste is still in wet storage as of last report.

And in their safe storage, the storage and surveillance plan which was Section 2.2 of Attachment 7, OPG said that that plan would commence in 2024; it would cover a 30-year period divided into two sub-stages, and it's only in the second sub-stage that the irradiated fuel would be removed from wet storage.

And as I understood the math then that meant that it would be only after 2029 or 20 years after the end of operations or tenures, it's not clear from that statement that they're actually meeting that accelerated target as they've just set out.

So I think a second look at that safe storage and surveillance -- the storage and surveillance plan is required to see if that is actually meeting that newly stated objective of Ontario Power Generation.

I think, just as a summary comment, I think that the application is weak in a number of areas and

we've looked primarily or almost solely at the waste and when you look at it from the operating stage to decommissioning stage to long-term storage stage, the application is very weak.

And when you look at the summary tables that CNSC staff provide where it says whether a -- in each aspect whether it is very satisfactory or satisfactory or below expectations, it comes off as satisfactory.

But if you translate that into a question of is this very safe, safe, or below expectations, the operation is safe, maybe. But it's not very safe. And I think your Web site says "Safety is our first priority" and I think OPG operations should be very safe. Satisfactory is not very satisfactory.

Thank you.

**(APPLAUSE/APPLAUDISSEMENTS)**

**THE CHAIRMAN:** Thank you.

I think we are going to try one more intervention before we'll break for lunch.

So I'd like to proceed to a submission by the Safe Community (sic) of Pickering and Ajax as outlined in CMD 13-H2.3.

And I understand that Mr. McKinnon will make the presentation.

Please proceed.

**13-H2.3****Oral presentation by  
Safe Communities of  
Pickering and Ajax**

**MR. MCKINNON:** Thank you. For the record, my name is Jim McKinnon and I am the Chair of the Safe Communities of Pickering and Ajax. I would like to thank Mr. President and the Members of the Commission for hearing my presentation.

My presentation is much lighter than you've heard earlier and I don't sing so it should go over very well.

The Safe Communities of Pickering and Ajax are for safety and health initiatives and programs to various age groups around the community, including youth, seniors, young workers and local businesses. These programs teach participants valuable skills that would keep them safe in the school, at home, in the workplace and in their community.

These programs could not be offered without the support of key community partners and OPG is a key community partner with us.

Other partners include the Town of Ajax,

City of Pickering, Durham Regional Police Services, the Durham District School Board, and Ministry of Labour, et cetera. So we have quite a few members but OPG is a key member.

I will use the acronym SCOPA through my presentation to stand for Safe Communities. SCOPA support OPG's application for operation licence for the Pickering Nuclear Generation Station because they have demonstrated industry and community leadership in safety in the community through our programs. They have a strong commitment to safety and protecting the environment, uncompromising and absolute and they've shown a strong commitment to our board by serving on the Safe Communities of Pickering and Ajax since its inception, which was 1997.

For the third year OPG has hosted the Threads of Life walk at their facility in Pickering to raise money for families of victims who have suffered workplace injuries and tragedies.

Through the corporate citizenship program, OPG have provided financial support to help SCOPA achieve leadership objectives. And OPG has assisted with costs of delivering the HERO's program to secondary school students. That's approximately 600 students in the Ajax/Pickering area.

This program teaches youth about smart

risks. As you could relate to risk -- there are stupid risks; you can drive down the highway without a seatbelt, that's a stupid risk, a smart risk is to have your seatbelt on. So that program is very popular and it talks to a lot of the students in the area.

In -- around leadership, the OPG was the first recipient of the Electrical and Utility Safety Association Gold Award and has received the ZeroQuest Platinum Award from the Infrastructure Health and Safety Association.

SCOPA, the Safe Communities Canada has recognized OPG with the Ambassador for Safety Business Partner Award. That's right across Canada.

OPG has demonstrated community leadership by supporting a number of injury prevention and safety promotion programs in Ajax/Pickering. And OPG has supported the Pickering Ajax Rescue Unit for Water Users, in Lake Ontario and the Frenchman's Bay resulting in saved lives.

In collaboration OPG partners with their host communities like the City of Pickering and the Clarington for community safety days. OPG supports youth workplace safety through the Passport to Safety. That's a program put on by the Workplace Safety Insurance Board which is made available to the young workers joining their

company for the summer in co-op positions as well as the employees' children.

This is a computer based online education and certificate program designed to eliminate needless injuries and prevent the deaths -- prevent deaths, sorry.

OPG runs extensive water safety programs in partnership with the Ontario Provincial Police and others to encourage people to stay clear and stay safe around dams, hydro-electric stations, and surrounding waters.

OPG is deeply committed to safety of the employees. They have a safety culture where employees are expected to build safety in every task. This results in a high level of safety performance.

Pickering Nuclear employees have worked more than nine, or sorry 10 million hours without a loss work injury. And Pickering Nuclear have maintained a safe operation of more than 40 years.

So with that background we firmly believe that OPG is committed to safety, not only in the community but with their operation as well.

OPG believes that the target of zero injuries is achievable which is -- I think is commendable. This is only -- not only good business sense but it shows a commitment to protect employees and sending them home healthy at the end of the work day.

So that concludes my presentation and thank you for the opportunity to make this to you.

Have you any questions?

**MR. CHAIRMAN:** Thank you.

Questions?

Monsieur Tolgyesi?

**MEMBER TOLGYESI:** Could you tell us who is SCOPA; what's your mission, who are your members and how many members you have?

**MR. MCKINNON:** Yeah, SCOPA stands for the Safe Communities of Pickering Ajax. If you looked at the letters, Safe Communities of Pickering and Ajax. The members include the Town of Ajax, City of Pickering, Ajax Fire Emergency Services, the Durham District School Board, the Durham Catholic District School Board, Durham Regional Police, Workplace Safety and Prevention Services, the Ministry of Labour, Ontario Power Generation, Safe Communities of Canada and the Youth Centre. That makes up our Board, so they are our members.

**MEMBER TOLGYESI:** Tell us what's your mission; you are there for what?

**MR. MCKINNON:** Our mission is to make the community of Ajax and Pickering, a safer place to live, learn, work and play. That's our mission.

**THE CHAIRMAN:** So do you ever discover the

-- discuss safety issue associated with nuclear emergency planning, all those things that we're discussing all the time?

**MR. MCKINNON:** Not to the detail that I learned today, but we definitely will in the future. It is discussed to some degree with senior groups through the -- through the fire services presentations that are made to them in their facilities.

**THE CHAIRMAN:** C'est tout? Anybody else?

I just -- I'm just curious, what is -- what is this -- this recipient of Electrical and Utility Safety Association Gold Award who are those Infrastructure Health and Safety Association?

**MR. MCKINNON:** I'm sorry; I don't have that information.

**THE CHAIRMAN:** So it's a national organization? Do you know that?

**MR. MCKINNON:** Yes, yeah.

**THE CHAIRMAN:** Anybody knows them? Don't know them.

OPG, do you know who they are?

**MR. JAGER:** Glenn Jager, for the record, I'll ask Craig Axler to describe who that organization and what they represent.

**MR. AXLER:** Good morning. It's Craig



Axler, for the record. I'm the Manager of Health and Safety Field Services for the Nuclear and Corporate Divisions of Ontario Power Generation.

The agencies you are asking about, Dr. Binder, are provincial agencies that are set up under the scope of the Ministry of Labour and the Workplace Safety and Insurance Board. They fund health and safety associations which are tied into various industry sectors that are recognized by the Province of Ontario.

The Electrical Utility Safety Association as -- as you know, is tied in with the electrical industry sector, and it has recently been merged with a few other sectors as well into a larger health and safety association which is the Industrial Health and Safety Association that was discussed here today.

**THE CHAIRMAN:** So I'm just curious, do what is ZeroQuest Platinum Award?

**MR. AXLER:** So the ZeroQuest award system is -- was originally developed by the Electrical and Utility Safety Association to recognize companies and organizations that are high performers in industrial safety expertise.

So they attend the workplace and conduct audits of their programs and some of their work activities to evaluate if they are suitable and satisfactory

candidates for achieving that level of award and if they are, then they recognize those organizations.

**THE CHAIRMAN:** Thank you. Thank you very much. Thank you.

Anything else?

Okay, thanks.

**MR. AXLER:** Thank you.

**THE CHAIRMAN:** We are going to break for -- 1:40, okay, we're coming back at 1:40.

Thank you.

--- Upon recessing at 12.52 p.m./

L'audience est suspendue à 12h52

--- Upon resuming at 1:42 p.m./

L'audience est reprise à 1:42

**MR. LEBLANC:** If you can take your seats, we will resume the hearing in the next few seconds.

Thank you.

**THE CHAIRMAN:** Thank you, we are back.

And before we get into the next submission, I understand that OPG want to clarify -- make a clarification of something.

Please proceed.

**MR. JAGER:** Yes, Glenn Jager, for the

record.

This is in response to Commissioner Velshi's earlier question around the information request.

OPG is an open and transparent organization and we cooperated with the information release for the hearing in a timely manner, made every effort to do so.

Following Day One, we received requests for 113 documents and approved the release of more than 100. The remainder were redacted or not released on the basis that they contained information that could impact the security or safety of the site.

There's also some that require a third-party consent which may not have been given for those documents.

OPG received information requests from the CNSC in regard to the design of the dry storage containers. Initially it was from the -- it was for the Pickering Safety Report Part 1 and then the Safety Report Part 2.

Both sets of information were approved for release. And in addition, OPG identified, there may be an additional document that could contain further information that would assist Northwatch in their review and this was also provided.

We'll continue to work with Northwatch and,

as a demonstration of that, a tour of the waste facility is scheduled already.

And additionally, if any other information is required from intervenors, they can continue to request that through Freedom of Information.

**THE CHAIRMAN:** Okay, thank you, thank you very much.

I'd like to move now to the next submission which is an oral presentation from Mr. Foster as outlined in CMD 13-H2.9. Mr. Foster, the floor is yours.

### **13-H2.9**

#### **Oral presentation by**

**David Foster**

**MR. FOSTER:** Thank you very much, ladies and gentlemen. I'm a senior living in the Port Perry, Oxbridge area of Durham where there's, I think, a general lack of awareness of what Darlington and Pickering Nuclear are all about.

That's a fault, I think, of the OPG. It seems to be an inherited attitude from when Ontario Hydro had privileged, highly paid experts who believed sincerely that the public could not possibly understand nuclear, made doubly mystifying by the link of atomic weapons and

military security. Spies were probably everywhere then, therefore, make it all secret, convenient too for avoiding pesky snoopers like citizens. I'm a snooper with the Council of Canadians and that's a citizen group.

I earn my living as a general systems analyst, that is a person who tries to make sense of how sub-systems connect or should connect.

Nuclear is a sub-system that has become disconnected, I think, from the larger world of good sense and the other worlds of energy production. Right now, there is a National Energy Board process doing much what you do, but in an entirely suspect process of self-advantage, Line 9 Pipeline Reversal, it is called. So you are to be commended for this process that you offer.

Since sending you my written comments to look for alternatives, I took the trouble to visit the wind farm of 86 Mills on Wolfe Island near Kingston. That's the second-largest in Canada. There is another view as to how to make and distribute energy, a 15-year process from inception to production, an expected life of 30 or 40 years.

No residue, agricultural continues around them. We can learn much from what they have done, in particular, openness.

Their particular concern is misinformation

about noise from rotating propellers. One sentence in their literature jumped out at me:

"If people have been pre-conditioned to hold negative opinions about a noise source, they are more likely to be affected by it."

They call this the Nocebo Effect. The same can be said about nuclear or dilbit oil, pro or con, bias, you can't budge. To them, wind is good. To nuclear, wind can compound disaster.

The core concern of my submission is lack of openness by OPG concerning nuclear here in Durham, lack of believable epidemiological studies as baseline reference points, for we know some people are far more sensitive to contaminants than the average. Yet we pretend differently.

Wishful thinking about evacuation of people should something go wrong and a total blotting out of any but engineering estimates as to the chances of technical failure. The obvious omission from the mix of failure is Boston bombers.

This grouping of reactors is the most tempting target, I think, for crazies in North America, to spew nuclear contaminants into the Great Lakes system and forever render them unusable.

Requests to continue this facility fly in the face of gathering momentum for the *International Great Lakes Waters Protection Act*. Business as usual appears to be steered by a privileged priesthood, now simply trying to protect their jobs.

I recognize that we, as a society, rely on nuclear-produced electricity and cannot easily disengage, but the disengagement should begin now. It should have begun years ago.

All of this makes me ask that you limit the licence of the Applicant to a short a term as possible and that you begin to dismantle the worn out plants now. Not waiting for 40 years where they remain as tempting terrorist targets.

Security itself is a migrating notion. Security and supply have tradition of freedom from danger. Its bodyguard is secrecy. It is that I object to. Why is it so hard for us citizens to see beyond the propaganda of the industry that it makes available in profusion.

We must go to extraordinary lengths to become aware of what is known, what is not known and what is wishful thinking by those with benefits to lose. The nuclear waste can never be benign.

We have an unbelievable background assumption that the Lake Ontario golden horseshoe should

be a highest density megalopolis destined to grow forever. That's still determining the broader view as to how human density and development should be handled here.

Growth is a pyramid scheme that has to fail eventually. It is part of the fallacy of consumerism, waste. Make it, junk it, make more. Endless growth, all using risky sources of energy.

You can't make a civilization that lasts based on that. Our planning horizons have to move to thinking in centuries rather than in four-year gaps between elections.

I ask: What redundancy of measurement is there for monitoring outside the zone that the reactors are within?

Clearly, the safe exclusion zone that prohibits local development here in Durham has been violated.

And what else? It is the lack of transparency that besmirches all government in this day of hiding information in plain view, on some obscure Web site.

What technical measuring equipment do we, the public, have access to in confirmation of official claims? What is the process to keep even us in the outer reaches of Durham informed and able to prove that



awareness?

I acquired a chart of the energies of the electromagnetic spectrum. I got it through the University UOIT, where I took a nuclear tour. This tour should be a basic within our education system and it is not.

We fail to teach technical systems to the public, and the most fundamental system of all: how citizenship is supposed to work. We all should have access to equipment that measures and informs us of these energies, even in public school. Even inconvenient truths.

Fukushima shows how the unexpected becomes disaster, and even when expected, that there is no one trained to handle the public reaction. It is not possible to train a free public, each goes his own way.

Run. But how? Where to? Hide under the desk.

My generation was told to hide under a desk when the atomic bomb goes off. Dig a hole in the backyard. Live there for three months on dried rations. We believed it. It was utter nonsense. Lies told by the military.

There should be a handbook each resident should receive, updated every six months, as to what risks they are living beside and for how long. What forms of

earning a living are still possible; lay it all out like a friendly annual report. Report the good with the bad, warts and all.

The butcher's bill in clean-up and medical costs when it goes wrong, can bankrupt the Province of Ontario; so transparency, please.

The national importation of crazies. Our nuclear facilities are a far more tempting target than the Boston Marathon. Crazies plant bombs. Our nuclear facilities carry a risk totally outside any engineering calculations. It is real. It is a danger our immigration policy created. Again, lack of systems thinking, or foresight.

For this reason alone, I believe you should allow only a short-term re-licensing of the facility and insist that the design life be adhered to. Wishful thinking to expand it to 240,000 hours is evidence of irresponsible political manipulation.

If you trusted the engineers to state a lifespan to the facility back then, why would you now believe they were wrong? What is truth?

How many jobs will be lost has nothing to do with imagining away the dangers. Where is there a credible multi-disciplinary study that shows the big picture of where Ontario is going, population stability

targets and the nature of the economic system and the new paradigm of sustainable community.

Have faith in half-baked science. What if you're wrong? All these have impact on our future. Where's the companion green energy, believable plan that must follow? Out of sight, out of mind.

We have ignored most of this as simply not noticed background. Few people, even in Durham, ever express curiosity in the reactor sites. It is time to be noticed front and center. Open the books; keep us, the public, informed so we can guide both the politicians and engineers into wiser choices.

Educate the next generation as to what is at risk and how we must adjust our expectations. Old guys like me know this. It is the young engineers wearing horse blinders who need to be re-educated. Theirs is only theory, not immutable truth.

My generation grew up before there were either electromagnetic or nuclear energies let loose. There's a dangerous unknown in DNA damage. There are dangerous unknowns as to how a future economy might work.

The underlying pyramid scheme of energy fuelling international trade through banks is simply a false avenue. The lesser economies like Greece or Nova Scotia that cannot manufacture and have little to trade

must inevitably go bankrupt.

We have to look to local economies. That too is part of the bigger picture. The banker is not your friend. He too is an unsustainable burden. That's systems awareness. How the pieces fit together.

So I ask that you invite people into the debate, open it up. OPG seems to have the money to lure Lake Huron townships into agreeing to buy a pig and a poke. Hosting nuclear waste, that I think is both immoral and absurd.

Spend the time to educate the local public with something a lot closer to the truth.

Reluctantly, as victims of circumstance I request first short-term licence on a short interval review and then immediate dismantling of what is past its due date. There are alternatives.

Thank you very much.

**THE CHAIRMAN:** Thank you.

Okay, who wants to start?

Questions?

Okay, I'd like staff to, one more time, talk about what happened to 210,000 hours that became 240. So as the intervenor claimed, you were wrong then, why would you trust -- why we trust you now?

Why don't you -- deal with that.

**DR. RZENTKOWSKI:** Greg Rzentkowski, for the record.

The subject of the end of assumed design life re-appears in many, many interventions and I -- I'm quite sure that this will probably be the dominant subject for the discussions here today and for the upcoming days.

So I would like to clarify a couple of points. In my opinion, this has been taken out of context in many of the interventions and is implicitly equated, almost, with a severe accident because we, CNSC staff, failed to articulate clearly what we do for safety and why it makes sense.

First, it has to be understood that the decision to end commercial operation of a site or reactor is mainly an economic one, dictated to some extent by safety considerations. This is because safety can be always improved, even in the case of a very old reactor. The question is only: At what cost and how safe is safe enough?

Especially that -- that as CNSC regulatory requirements and expectations continue to evolve, the licensees will have to meet even higher safety performance standards in the future. This has to be realized.

Second, the end of assumed design life is -- is a regulatory trigger to update the safety case of

the reactor with particular focus on preservation of safety margins, condition assessment and fitness for service of major components, and integrated plant ageing management in order to maintain the required level -- required level of safety.

The end of assumed design life is not an indication of a cliff edge effect, meaning that the reactor is safe today but it will be unsafe tomorrow. It's like a car. It doesn't break down the day after the warranty expires.

Third, the required level of safety of reactor operation is being maintained and even enhanced over the entire lifespan of the facility. The safety is never in question. Reactors are subjected to regulatory scheduled maintenance outages to inspect and, if necessary, repair or replace reactor components including pressure tubes. Mandatory tests of essential system and equipment are -- are also conducted to demonstrate the required availability on demand.

Finally, as part of the assessment of the safety case, single failures of process system, such as heat transport system piping, including pressure tubes are considered are dual failure of a process system and a safety system; for example, a pipe break and a failure to activate the emergency cooling injection.

So what would happen in the case of the pressure tube rupture?

In this case, I don't have to speculate. As a matter of fact, in 1983, a pressure tube ruptured in Pickering A Unit 2. This resulted in the discharge of heavy water at the initial rate of 900 litres per minute in the refuelling machine rooms.

The reactor was operating at full power at the time and was manually shut down once the operator determined that a sizeable leak had developed.

None of the automatic plant safety systems were called upon to operate and at no stage of the incident were emergency procedures called for or necessary. No fuel failure occurred during the incident and releases of radioactivity around the plant remained at nominal level at all times.

In summary, the required level of safety can be maintained during the long-term operation of reactors. The probability of operating incidents may eventually increase due to ageing but the risk does not due to the effective implementation of defence-in-depth that prevents escalation of incidents to accidents.

The safety goals give an approximate statement of the risk of reactor operation. I would like to clarify those points.

**THE CHAIRMAN:** Do you want to react to that?

**MR. FOSTER:** I have to admit to a hearing problem and the accent that I wasn't able to fully appreciate. I understand that these are technical responses and I accept them as being offered in good faith towards my general comment.

Yes, it was taken out of context and I'm unaware of the depth of that context.

Nonetheless, that does not detract from the major thrust of what I'm trying to point out, is that it is not technical failure we fear. It's the unexpected that can come in from the side where somebody wants to blow us up like they did the marathon in Boston.

**THE CHAIRMAN:** Okay. So maybe just a very short review; what's the site susceptibility to a terrorist attack?

**MR. JAGER:** Glenn Jager, for the record.

The site is very secure against all threats. Of course, the specific features we would have to discuss in camera.

I can ask Mr. Paul Nadeau, our V.P. of Security, to comment further, but I would say we meet all current standards. We're very involved in the security community, if you will, to remain aware of any threats and



be in a position to deal with those.

So I'll ask Paul -- or Denis McBride, I'm sorry, Director of Security, to respond.

**MR. McBRIDE:** Denis McBride, for the record. I am the Director of Security and Emergency Services Programs at Ontario Power Generation.

In response to, Mr. Chair, your question regarding terrorism, OPG has a defence-in-depth program in place around our security at our facilities. We have an intelligence network. We're very well plugged into national and international intelligence networks.

We have very robust structures. We have a very robust security program which meets all CNSC requirements. We have a robust program around our own staff to mitigate insider threats. We do intensive studies around current design basis threats, current modus operandi that are out there in the world in terms of techniques, tactics, and equipment that may be used to try to compromise our facilities.

We're extremely well tuned to what is out there and how we would respond.

**THE CHAIRMAN:** Thank you.

Mr. Foster, your last words?

**MR. FOSTER:** I have nothing really to add. I have made my point. In the original written submission

that I sent to you, I believe I mentioned that another similar threat comes from our air force having taken part in bombing in Libya. What that does is create a bunch of angry Libyans who know how to fly airplanes.

In your presumed means of trying to protect us, a Libyan in an airplane can come and crash it anywhere along any of our 10 different nuclear places if they want to. And unless we have SAM, the surface-to-air missile sites along the shore, that is still something that we've got to worry about. It could be in a small Cessna.

It's not necessarily that your security is going to give you information about this. Terrorists are really quite secret about what they're going to do.

I think that is a far greater chance of failure that can threaten us all than is the technical leaks that may happen, which I believe that our engineers have done a very good job on trying to protect us from happening.

That's all. Thank you very much.

**THE CHAIRMAN:** Thank you. Thank you for the intervention.

I would like to move to the next submission by the Pickering Nuclear Community Advisory Council, as outlined in CMD H2.11. And I understand that Mr. Gillis will make the presentation. Please proceed.

13-H2.11

**Oral presentation by the  
Pickering Nuclear Community  
Advisory Council**

**MR. GILLIS:** Okay. Mr. Chairman and Members of the Commission, for the record, my name is Francis Gillis. I am Secretary of the Community Advisory Council to the Pickering Nuclear Generating Station.

I will not be making the presentation myself. I am joined here today by three members of the Council who will be presenting the intervenor message.

On my left is Ms. Norma Drummond, former member of the Durham Nuclear Health Committee. She has worked as -- or had worked as a consultant for public health for 20 years.

To my right, Mr. Jim Dike, a retired Chief Financial Officer, a resident of Ajax, Past Commodore of the Frenchman's Bay Yacht Club, and a member of the Pickering Waterfront Coordinating Committee.

To the left of Ms. Drummond is Mr. Dan Shire. He is a consultant with a major information technology company and a resident of Pickering. Mr. Shire represents the Pickering Naturalists Club at the Council

table.

So beginning the presentation will be Norma Drummond.

**MS. DRUMMOND:** Good afternoon. As a member of the Pickering Nuclear Community Advisory Council, we would like to comment on the Pickering Nuclear Generating Station Application for renewal of its operating licence for five years.

The Community Advisory Council supports the Application. A core vehicle for OPG dialogue with the community, the Advisory Council assists Pickering Nuclear Generating Station in identifying and responding effectively to the concerns of the community.

The group is made up of citizens, representatives of community organization, and of members of local government staff and agencies, who examine a wide range of issues associated with OPG in Durham Region and at the corporate level. Most members report back to one or more constituencies.

Meetings are open to the public and the local media representative attends regularly. Minutes are posted on the OPG public Web site and they are available through public libraries in Durham Region.

In our interventions in CNSC hearings over the past number of years, the Council has not taken a

position for or against licence renewals or acceptance of environmental assessments. Rather, drawing on the Council's interaction with OPG over time, we have assumed the role of *amicus curiae* commenting on the company's relationship with us and with the community as a whole.

More specifically, we have discussed OPG's dialogue with us and the broader community regarding each issue brought before the CNSC. We probably have more regular interaction with OPG than any other group in the community.

Based on this dialogue over a dozen years, knowing that our neighbours who work at the plant would not so do, if it were in any way unsafe, and on the CNSC site staff positive assessment of station operations, we have evolved from our position of *amicus curiae* to one of positive support for the Pickering nuclear application for renewal of its licence to operate.

It is important to note that the tenure of our dialogue with OPG has evolved over time. When the community working group was brought together in 1999, their interaction with OPG was more confrontational than we experience today.

The working group set out 160 issues that they wanted OPG to address to ensure themselves that the Pickering plant was being operated in a socially and

environmentally sound way. Once the working group had completed its mandate, the Community Advisory Council was established in the year 2000, bringing together new members as well as members of the working group.

The new group inherited the 160 issues. It took years of resolve to resolve the issues, through dialogue between the advisory council and OPG. The interaction with OPG on the 160 issues, along with many other issues that arose during that time, demonstrated that the company any moved from what was seen as an aloof relationship with the community to one of more open dialogue and responsiveness.

The advisory council was more supportive of OPG because of the forthright way in which the company responded to our comments and questions. The trust between the council and the company has enhanced the productivity of our dialogue.

**MR. GILLIS:** We will now turn to Jim Dike who will continue with the message.

**MR. DIKE:** For the record, my name is Jim Dike.

The description of our meetings with OPG as dialogue is apt. The company does not just provide information, including technical information made understandable for lay people, but also asks for and

receives our feedback.

As well, council members raise issues and ask questions. For example, a council member has suggested the topic of nuclear plants being decommissioned around the world, and the implications of the Pickering nuclear, which is scheduled for shutdown in 2020, be discussed at a future meeting.

Another member has called for an update in the status of the Public Early Warning System for Nuclear Incidents that might require evacuation of Durham Region residents.

As well, council members have raised concerns about delays in the Government of Ontario decision-making regarding nuclear build at the Darlington site. They have suggested a visit from the Ontario Power Authority to talk about how these delays might play into the advice that OPA provides the government about options for bridging power supply during the extended effective period, which Ontario's nuclear generating capacity will be significantly reduced.

While the council has an excellent relationship with OPG, we speak to, and frankly, about the company. The council members maintain a good mix of new and experienced members, which prevents us from developing an over-identification with OPG, but also makes for

continuity and dialogue.

Relevant to the Pickering Nuclear Generating Station's application for its new operating licence, we note the general trend in plant operations over the years has been improvement from good to better. Radioactive emissions are down, worker safety performance has continued to improve and OGP is a good neighbour through the Pickering community, effectively engaging people in its plans and activities.

OPG keeps the council and community apprised of developments at the site through public meetings, a quarterly newsletter, travelling information kiosks, and innovative approaches to information sharing. The kiosks are designed to answer frequently-asked questions from the public, and have been located in the Pickering and Ajax libraries during the past 18 months.

OPG is currently completing some maintenance and updates on the equipment and, as of this writing, expects to place the kiosks in the Pickering Recreation Complex and the Ajax Community Centre.

Another aspect of the community outreach is the company's commitment to environmental education aimed at the general public. This commitment is evidenced by OPG's efforts to involve children in the community, in environmental education on a number of levels. The



company interacts effectively with various projects beneficial to the environment, but they also go the extra step of seizing the teachable moment, thus giving examples to young people about the value of science in everyday life.

**MR. GILLIS:** We will now move to Dan Shire, who will complete the letter.

**MR. SHIRE:** Dan Shire, for the record.

When site incidents such as the recent fire in the Unit 1 lube oil purification system do occur, the council has seen firsthand that OPG is very serious in their approach to a root cause analysis.

At a more general level, the council has also been impressed with the efficiency benefits from the amalgamation of Pickering A and B.

In our January meeting each year, the senior site vice-president walks us through the objectives and the goals for the site for the coming year. Over the last two years, much of that focus has been on the progress of amalgamation of the site, and we've seen that there's a serious management approach that's been taken to this matter and we've noted a number of milestones on the way.

The result now is a single station with one management team, and we're satisfied that the functions

are every bit as effective and well-run as they were under two separate units. We've been very pleased to hear about the synergies that have arisen from the integration of effort that has taken place.

Over the last year, particularly in applying lessons learned from the incidents at Fukushima in 2011, OPG has demonstrated that it has made the plant safer.

For example, the installation of new hydrogen mitigation equipment to prevent hydrogen build-up, portable diesel generators and pumps purchased to add flexibility in supplying essential fuel cooling through multiple pathways, and added protection to used fuel bays and speeding up of the process of safely storing used fuel in the above-ground fuel containers.

We have seen over the years a trend of continuous improvement of Pickering Nuclear Generating Station, and the steps taken to ensure robustness of the units gives us high confidence that Pickering plant will be operated safely and efficiently through its planned shutdown in 2020.

In conclusion, the shutdown of the Pickering nuclear operations in 2020 raises questions about what will happen after that date.

For example, will there be job losses in

the community? How will safe dismantling of the units be assured? Will a natural gas plant or other industrial facility potentially be built on the site?

The CNSC will be interested in considering the nuclear safety implications of these questions closer to the shutdown, however, council believes that OPG must also look at these issues much more in advance and we plan to remain involved in that long-term transitional process.

Finally, we'd like to compliment the CNSC on improvements that they have made recently to their Web site. I had the opportunity on the weekend to explore the CNSC on-line site and I found it engaging and interactive, and a very useful tool for helping inform people.

We feel our -- we are fortunate to have at our meetings the regular involvement of senior CNSC staff, at our council meetings monthly. This makes the CNSC more accessible to community groups such as ourselves, and we are confident that if we have a question relating to the regulatory process of the nuclear industry in Canada, that we can get those answers quickly and competently.

Thank you.

**THE CHAIRMAN:** Thank you.

Monsieur Harvey?

**MEMBER HARVEY:** Merci.

How many members are there if your

organization?

How many members and I'm asking that because you mention that there is some kind of renewal, and you've got new members.

So could you elaborate on that?

**MR. GILLIS:** We have currently 15 members and there's no fixed term, but people serve anywhere from a couple of years to five or six years -- or longer, I'm told here.

And we try to fill gaps that occur as people retire and replace them with people assigned from local governments or people with interests in specific areas in the community, people with certain kinds of expertise.

**MEMBER HARVEY:** What type of relation do you have with the surrounding population?

**MR. GILLIS:** The people on the council are drawn from the local community, and many of them have involvement in local NGOs. Also, others have involvement as staff members of local government.

**MEMBER HARVEY:** The Mayor mentioned earlier today that he hasn't received any calls after Fukushima. So did you receive any complaints or requests from the population after Fukushima ---

**MR. GILLIS:** To my knowledge ---

**MEMBER HARVEY:** --- or have you been concerned with the ---

**MR. GILLIS:** To my knowledge there were very few.

Jim, do you recall hearing about any concerns expressed in the community to OPG about Fukushima?

**MR. DIKE:** There were some concerns and they were handled basically through the public relations section of OPG.

When those things occur they report it to the committee and we get the type of answer that is given to the person who is making the questions. There are always somebody who is going to ask a question and it is reported at the community council that these questions are asked and by the public in general and we get a response on that basis.

**MEMBER HARVEY:** Over the 160 questions or issues you had, is this to say that they have been answered to your satisfaction and you no more have any issues in front of you?

**MR. DIKE:** The answer is yes, they have been satisfactorily answered. A lot more questions have been asked since and they continue to be asked.

We expect that the community council will

continue to represent the views and the questions that come from the community. And in some cases we ask questions that my friends are forwarding to me and to other members of council and we put them to the people of OPG at the meetings. And we either get answers right away or we put it on the agenda for the next meeting and answers are brought back to us.

**MEMBER HARVEY:** You have asked much questions to the staff than OPG or it's mostly OPG?

**MR. DIKE:** I'm sorry, I'm not -- I'm trying

---

**MEMBER HARVEY:** Well, I mean you mention quite often OPG -- you send a question to OPG but did you do the same thing with the staff, with the CNSC?

**MR. DIKE:** Typically there's a member of the CNSC staff there and if we have any questions we can ask that. Typically we don't ask that many questions of the CNSC staff.

**MEMBER HARVEY:** Thank you.

**THE CHAIRMAN:** Thank you.

Anybody else?

Ms. Velshi?

**MEMBER VELSHI:** You mentioned that your meetings are open to the public. Do you get many members of the public show up at your meetings?

**MR. DIKE:** Typically no we don't. There is a reporter there for the meetings. The minutes of all our meetings are published on the Web site after -- we have a procedure, we do the minutes at the next meeting. We review the minutes of the previous meeting to make sure they are accurately recorded and then they're published on the Web site at OPG.

So the minutes are recorded that way so the public is aware of that. And that -- everybody has access to that, to the OPG Web site.

Occasionally there is somebody from the public who attends but generally speaking not very often.

**THE CHAIRMAN:** Mr. Tolgyesi?

**MEMBER TOLGYESI:** On your Terms of Reference you are mentioning that who are citizens at large who are your constituencies, you are mentioning labour movement and you are saying that not an employee or a retiree from OPG; what it means?

**MR. GILLIS:** I'm sorry, you're asking why --

**MEMBER TOLGYESI:** Yeah, what it means that, employees of -- former employees or retirees from OPG cannot participate in meetings or what it means?

**MR. DIKE:** Okay, I understand that.

Former employees or retirees certainly

could participate in the meeting. Typically the people who are on the committee are appointed to represent a community group or a portion of the local government. But certainly the meeting is open to the public and any retirees certainly would be welcome to the meeting.

**MR. GILLIS:** But they cannot be members of the -- of the committee.

**MEMBER TOLGYESI:** They cannot be members of the committee, the board; that's what you mean?

**MR. GILLIS:** Of the CAC.

**MEMBER TOLGYESI:** Yeah. And so you were saying that there's not too many participation from general public. Do you have any procedures that regulate -- you know, how you could present, how you could assist to the meetings?

Because we had some previous -- you know, according to you there is a good collaboration and flow of information and its outreach of OPG is doing well. But some previous intervenors were talking about obscured info, unanswered questions, about attitude of OPG. Did you observe a similar kind of behaviour?

**MR. DIKE:** You're asking if that is the experience of the council. I think Dan can speak to that, Dan Shire.

**MR. SHIRE:** So I've had an opportunity to



be on the council for about seven years. And I represent Pickering Naturalists which is a group of about 110 people in eastern Scarborough and western Durham who are interested in nature. And actually we've submitted a written submission as well which I think you get to on Wednesday or Thursday.

I regularly report back to the executive of the Pickering Naturalists and also at the monthly meetings to talk to them about a variety of things that are happening that are affected in the community by Pickering Nuclear's operations.

A lot of those are related to environmental education projects that OPG sponsors, initiatives related to biodiversity, and some other very productive and encouraging developments that the OPG has taken in the community in terms of biodiversity and so on.

So in the meetings that I've presented at over the last four or five years, people have asked question occasionally about Fukushima. And also mostly the focus is on -- you know -- what kind of projects is OPG involved with, Bring Back the Salmon, Alex Robertson Park naturalization, those kinds of things.

So I -- of the naturalists that I interact with on a regular basis the engagement and understanding of what OPG does in the community is pretty high and I

think appreciated as well.

**THE CHAIRMAN:** Okay.

**MR. GILLIS:** If I may comment. There's a quarterly newsletter that goes out, there's 125,000 goes out to the local community and that covers all of Durham Region and parts of the GTA as well.

So there is an attempt in that respect, the travelling kiosk that goes out is basically something that is available to the public. It is basically in -- has been in Ajax and Pickering which are closest to the local plant but anybody who is visiting those areas certainly has access to it.

And all calls come in to the public relations department from all over the area. It isn't just the local area on that.

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

We will now move on to the next submission which is an oral presentation from Ms. Hayward-Haines as outlined in CMD 13-H2.58.

Please proceed.

**13-H2.58**

**Oral Presentation by**

**Jo Hayward-Haines**

**MS. HAYWARD-HAINES:** Good afternoon

Commissioners of the Canadian Nuclear Safety Commission, spokespersons for OPG and all intervenors. I am Jo Hayward-Haines. We're here to consider as a community of concern the recent OPG proposals for Pickering Nuclear.

In this unprecedentedly difficult era of so many unknowns relative to climate change, it's clear that we all have new responsibilities. And many of us already are carefully examining the premises upon which we have based our lives so far.

After necessary research and consultations it is also our civic and human responsibility to creatively consider all possibilities where further risks and damage to the environment are indicated.

We are conscious of our responsibilities to all life, as well as to the lives of our grandchildren and their progeny.

Reading through the OPG and the CNSC documents regarding the relicensing of Pickering prepared by experts, I am experiencing a deep and abiding sense of disquiet.

Foremost at the moment is an attempt to omit a Canadian environmental assessment as no longer legally required when, in fact, according to Sierra Club

Canada, the new Canadian *Environmental Assessment Act* of 2012 came into effect two days after the OPG's Application was submitted, therefore, making that Application subject to the more comprehensive provisions of the 1992 *Act*.

Less esoteric are the facts known to more and more of us. Electricity use in Ontario is in decline. The development of new alternative technology is growing apace; OPG ignores this phenomenon, as far as I know. There is no serious solution to the problem of storage of nuclear waste, which is radioactive for 100,000 years. The effects of released tritium are still not known. There are known dangers to plant structures associated with extending the life of reactors and so on.

As a teacher, I've always encouraged my students to research thoroughly while asking relevant questions, to listen deeply and to consider carefully the context of their inquiries. I am a mother and grandmother, which means I am profoundly concerned about the legacy we are leaving for our children and for all life.

I delivered an oral presentation at the Darlington hearings and my concerns are even more intense here at Pickering. I'm fortunate to share encouragement and support with others equally dedicated to supporting ways of life that enhance life. Nuclear energy does not.

It's a funny kind of situation we're faced with, sort of like being on a train hurdling at high speed toward a cliff. Beautifully designed and outfitted, this train, with an agency that assures that all systems are in impeccable working order. Maybe carrying highly enriched uranium. That is a gift to us from the Canadian Nuclear Safety Commission. A screw loose on a steering column, a hairline break in the rail caught and fixed. Magnificent oversight, something we can all be proud of.

But the actual oversight is the toxicity of the cargo, the danger of the speed and the direction of the train itself. Not to mention the cost of upkeep. The current policy is to save the aged Pickering while replacing those horizontal pipes in the CANDU at Darlington.

The shelf life of our nuclear reactors is 210,000 hours. The CEO of Hydro Québec likened extending that lifespan to flying in a plane without permits, without meeting standards. "Who would fly under those conditions? Out of the question", he declared.

Refurbishment means the replacement of all those pipes, a rebuilding. To request an extra five years for Pickering without replacing pipes, not knowing when these pipes might be at the bursting point, is unconscionable.

Quebec Gentilly closed over just that issue; pipes to a permanent reactivity waste and it cost more than 2.4 billion to replace those pipes.

And Pickering has the distinction of being the highest cost nuclear plant in North America. According to Ontario Clear Air Alliance, \$850 million a year could be saved with nuclear shutdown.

You've heard from -- this Panel has heard from many scientists and environmentalists, from municipalities, health workers, NGOs, lobbyists, workers, many of us actually pray with all our hearts that what is being brought to you in these hearings will somehow open your minds to do -- to new and more widely successful possibilities as energy sources for our future.

If just one of you is moved to consider this issue outside the current confines of the relationship between the refurbishment of Darlington and the extension of Pickering beyond its proposed lifespan, that would be a sign.

It would be a signal that our human capacity of consciousness of conscience is alive and functional. You could have the courage to push the tipping point to what Einstein hoped for. A new way of thinking, which considers the whole biosphere and its deliberations and not merely economically or

intellectually vested interests.

My colleague, Carol Hooper, and I would like to make the following bit of this presentation.

(Sung by the presenters):

"By the shoreline of the great lake  
grew a monster, tall and proud, with a  
fire and its bowels and its aura was a  
shroud. Oh, the loss of sense and  
wisdom that still feeds that evil  
beast, guarded by the CNSC, OPG's  
mandate won't cease.

Fuel rods are made by GE and they burn  
with nuclear fission. Boiling water  
for steam power deep within protected  
cisterns. It was war that brought  
technology to provide cheap energy,  
and to earth new devastation, while  
the sun gives power for free.

Let's awake from greedy dreaming,  
let's put human synergy into sun,  
wind, geothermal, for a sane reality."

We can't close without mentioning what the failure of the electric system of any nuclear reactor would mean. As we have recently learned from Fukushima, which was melting away during the interventions for

Darlington refurbishment, with supreme cosmic irony, electrical failure caused by natural or man-made forces means meltdown.

The cooling pumps are rendered inoperable except by generators. We have yet to determine the consequences to the extent of radioactivity emitted and being emitted from Fukushima, though we know relatively -- sorry, radioactivity was less in Tokyo, which is 150 miles away from this site. Toronto, on the other hand, is only maybe 45 miles away from Pickering, 50-some kilometres. Of course, there are special laws in place to protect against financial liability. But what laws exist to protect against ecocide?

In closing, I'd like to quote from a relevant section of the Earth Charter, a product of decades of multinational cross-cultural consultations about common goals for an emerging global society founded on sound principles of ecological knowledge and sustainability.

Finally approved at UNESCO headquarters in Paris in March of 2000, it encompasses respect for nature, universal human rights, economic justice, and a culture of peace.

Here's what's relevant to us now, under Section 2, Ecological Integrity, are listed these



principles:

- "1. Take action to avoid the possibility of serious or irreversible environmental harm even when scientific knowledge is incomplete or inconclusive.
2. Place the burden of proof on those who argue that a proposed activity will not cause significant harm, and make the responsible parties liable for environmental harm.
3. Ensure that decision-making addresses the cumulative, long-term, indirect, long distance, and global consequences of human activities.
4. Prevent pollution of any part of the environment and allow no build-up of radioactive, toxic, or other hazardous substances.
5. Avoid military activities damaging to the environment."

With these principles in mind, following our concerns and requests, as the oldest operating nuclear station in Canada, Pickering poses unacceptable risks to the habitats in humanity in the vicinity, not only at

present, but for future generations.

The implications of climate change, unknowable at present, make necessary the application of the precautionary principle.

Innovations and alternatives stimulate the economy more than the nuclear industry does and investment in nuclear energy is down. Cost overruns, there are precedents, will be borne by current and subsequent taxpayers when economic instability will make this burden untenable.

Insurance companies cannot adequately insure against nuclear accidents. Predicted economic and social instability pose increased risks of terrorist attacks to nuclear plants.

In view of these and many other concerns we request that the Commission deny OPG a 5-year license renewal and instead give Pickering a temporary license with instructions to prepare for the closure of Pickering by the end of 2014. These instructions must include robust requirements for decommissioning and clean-up.

Now is the time to finally put earth charter principles into action, for economic, as well as for environmental reasons. Our energy policies are a good place to start.

To fail is to fail not only our own progeny

but all life on this living planet.

Thank you very much.

**(APPLAUSE/APPLAUDISSEMENTS)**

**THE CHAIRMAN:** Thank -- thank you.

Anybody, any question?

**MEMBER McDILL:** Pardon me. Thank you for your contribution and your comments.

I wonder if I could ask staff to address -- I know we did it in Day One but I think it's worth repeating for the record, with respect to CEAA and the environmental assessment and how that is being dealt with today.

**DR. THOMPSON:** So, Patsy Thompson for the record. I'm the Director General responsible for environmental assessment and environmental protection at the CNSC.

And so the *Canadian Environmental Assessment Act* was modified and the new CEAA 2012 came into force, as the intervenor said, a couple days after the license application.

**MEMBER McDILL:** Just a second -- are you able to hear?

**MS. HAYWARD-HAINES:** It's very difficult to hear.

**MEMBER McDILL:** Thank you.

Could we start again, please?

**DR. THOMPSON:** So I'll try to speak more directly in the microphone.

**MS. HAYWARD-HAINES:** Thank you.

**DR. THOMPSON:** That's better? Okay.

So the *Canadian Environmental Assessment Act 2012* did come into force a couple days after license application.

However, having said that, if the 1992 *Canadian Environmental Assessment Act* had been into -- in force there would not have been a requirement for an environmental assessment, under the old CEAA because license renewals are not -- were not a trigger in the 1992 *Canadian Environmental Assessment Act*.

Having said that, it's not because an assessment is not required under the CEAA that no environmental assessments are being done.

This is essentially the bread of -- and butter of the group I manage. The *Nuclear Safety and Control Act* has requirements for environmental protection and for the protection of human health, health of the public and workers.

And so for the Pickering sites there have been two environmental assessments, very detailed assessments done under the *Canadian Environmental*

*Assessment Act.*

There was one very detailed environmental risk assessment and human health risk assessment done under the *Nuclear Safety and Control Act* and there's been ongoing monitoring and assessment for fish, for example, for radioactivity in the environment.

And all of that information is looked at and evaluated on an ongoing basis. And that's essentially -- all of that information is taken into consideration when staff makes recommendations to the Commission for license renewals or other issues.

**MS. HAYWARD-HAINES:** Are those reports accessible to public?

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

Yes, they're all available to the public. In all cases there was extensive public consultation on the Pickering A environmental assessment, the Pickering B environmental assessment, the environmental effects review that was done under the *Nuclear Safety and Control Act*. There was also a lot of work with the community and public engagement.

And moving forward, if we were to do additional work, as we've done in the past, we do get public input from -- on relevant issues.

**THE CHAIRMAN:** Dr. McDill?

**MEMBER McDILL:** Thank you.

I wanted to go back to the intervenor to see if there's anything that can be added to that response.

Do you have any specific questions with respect to ---

**MS. HAYWARD-HAINES:** Do I have any specific questions?

**MEMBER McDILL:** Yes.

**MS. HAYWARD-HAINES:** Well, I don't know how to formulate them. I mean I -- where would I -- where would one have access to this -- these assessments, the environmental assessments that were done? And how -- how would they differ from -- the fact that -- that they're not required anymore is obviously a concern.

So how has that requirement affected, or not, the -- the oversight of Canadian Nuclear Safety Commission?

So there are two parts to my question. Sorry I haven't been very clear. One, how can we access that information? And, you know, I mean it's been done, okay, I accept that.

And two, I guess I'll have to answer that question when I look at the assessment. Whether or not

it's different now that the regular assessment procedures have changed.

**MEMBER McDILL:** Dr. Thompson?

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

What we could do is speak with the intervenor at break and sort of -- if I get the information on the email address or whatever, I can provide the information, the reports, that are available.

There's also information on the OPG Web site that could be useful as well, but we'll provide what the CNSC has in terms of previous assessments.

What I would say as well is that the Canadian Environmental Assessment, either the Act that was promulgated in 1992 or the new Act, was focused on new -- on new projects or major amendments.

The *Nuclear Safety and Control Act* has ongoing requirements for environmental protection. We have had in place standards and guidelines on how to conduct human health risk assessments and ecological risk assessments. And working with the Canadian Standards Association there is a new standard, it's called N288.6. It's a standard on how to conduct environmental -- environmental risk assessments and human health risk assessments.

And OPG, as other licensees of the CNSC, are required to, essentially, comply with that standard and have ongoing assessments and a review of their environmental footprint. And we do, essentially, technical reviews and oversights and compliance activities on this.

And so the level of rigour is the same whether the CEAA is required or not and we do call upon technical specialists from other departments as needed as well.

**MEMBER MCDILL:** So your conclusion is, if I can put words into your mouth, there is essentially no difference in the requirements, the rigour is the same between the two Acts?

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

That's correct.

**THE CHAIRMAN:** Thank you.

Anybody else, any other question?

Okay, thank you. Thank you for your intervention.

**MS. HAYWARD-HAINES:** Thank you.

**THE CHAIRMAN:** I'd like to move to the next submission by the University of Ontario Institute of Technology, as outlined in CMD 13H-2.25 and H2.25A.



And I understand that Mr. Bereznai will make this presentation? Sorry, Dr. Bereznai.

The floor is yours.

**13-H2.25 / 13-H2.25A**

**Oral presentation by the  
University of Ontario Institute  
Of Technology**

**DR. BEREZNAI:** Mr. Chair and Commissioners. For the record my name is George Bereznai. I was hoping to have the presentation up on the projector.

**THE CHAIRMAN:** I think it's coming. It's there.

**DR. BEREZNAI:** Thank you.

I'm a Professor in the Faculty of Energy Systems and Nuclear Science at the University of Ontario Institute of Technology.

Prior to my appointment at UOIT I worked in the Nuclear Division of Ontario Hydro and its successor company, Ontario Power Generation.

As part of my initial job with Ontario Hydro I was assigned to work at the Pickering Nuclear Generating Station. This was in September 1972, when the power plant consisted of only Units 1, 2, 3 and 4 and unit

4 was still under commissioning.

Much of the area shown on this slide to the east and to the north of the station was yet to be developed and consisted mostly of corn fields.

The construction, commissioning and operating success of this first multi-unit CANDU nuclear power plant was a great Canadian technological achievement.

And I'm proud to be here, more than 40 years later on the occasion of having the operating licenses for the Pickering Nuclear units renewed for another 5 years.

In this presentation, I would like to highlight my experience as a resident who lived, worked and played in the neighbourhood shared with the Pickering power plant and, as an engineer and educator, who continues to enjoy a professional relationship with Ontario Power Generation.

In September 1972, my wife and I and our 6-month-old baby son moved into the townhouse complex known as "Village by the Lake", shown on this slide, located near the northeast corner of Frenchman's Bay, and within 4 kilometres of the Pickering Nuclear Plant.

Several of the engineers and other plant personnel with whom I worked also lived in Bay Ridges,

which is the area shown on this slide.

We enjoyed the parks, the leafy neighbourhood and often walked and bicycled to work. At that time, the 401 had only two lanes in each direction east of Markham Road. The Sheridan Mall, now called the "Pickering Town Centre" was a month away from opening, and the Tee Pee Drive-In was showing movies where, now, the Supercentre stands.

The electrical energy generated in the intervening 40 plus years by Pickering NGS greatly contributed to the growth and quality of life of the people living in the GTA, as well as in the Durham region and beyond, by powering the many enterprises that provide jobs and lighting the many homes that were built in these areas.

The alternative to the Pickering nuclear units when they were constructed in the 1960s and 70s would have been more coal-fired power plants with their attendant air pollution and excessive greenhouse emissions.

Gaining renewal of the operating licences for the next five years will enable the Pickering nuclear units to continue generating electricity with minimal environmental impact.

All the coal burning plants have been shut

down in Ontario, and large wind-generating capacity is being added to the bulk electric system. Not only is the cost of electricity generated by wind farms much higher than as produced by the Pickering nuclear units, but every Megawatt of wind generation needs to be backed up by a similar amount of gas turbine capacity given the intermittent nature of wind.

And although burning natural gas to produce electricity results in less pollution and has a somewhat lower impact on climate change than burning coal, we do know that such power plants have not been welcome in either Oakville or Mississauga.

Our firstborn was enrolled in Sir John A. Macdonald Elementary School when he started in Kindergarten, 4 or 5 years after we moved to the area, to be followed in subsequent years by his two brothers. At no time were my wife and I concerned about our boys spending their school days within 1500 metres of the nearest nuclear reactor.

By living within walking distance of school and work, we were in fact far safer than any of the thousands of people who exposed themselves willingly and daily to the risk of traffic accident while driving to and from work through Pickering on the 401.

We also spent many happy after-school hours

at the playground and sport fields just north of the power plant. I was just a few minutes walk from the Pickering Learning Centre where I was working while our boys attended a nearby school.

The land for this park and sport fields was donated by Ontario Hydro to the town thereby significantly contributing to the quality of life for the people with access to the neighbourhood of the Pickering plant.

I would now like to show this quote from OPG's submission in the recent licensing application. As I was reading this application to renew the power reactor operating licence for the Pickering Nuclear Generating Station, I noticed the text shown on this slide that links my previous career in the nuclear industry and my current role as professor at the University of Ontario Institute of Technology in the field of Nuclear Engineering.

Not only is OPG sending its engineers during work time to further their education at UOIT, but the course material including the software that simulates the behaviour of the nuclear plants have been made available not only to the courses attended by the OPG engineers, but all the students enrolled in the various nuclear degree and the diploma programs offered by the university.

The particular graduate diploma program

referenced in OPG's application consists of the 4 courses shown on this slide.

This set of courses highlight the importance of safety that is the over-riding consideration in the design of nuclear plants, knowledge of the systems and their integrated operation under normal as well as abnormal conditions and processes and techniques that are unique in the nuclear design area given the complexity of these plants, the interactions between designers, manufacturers, constructors, operators, maintainers and, of course, the regulator.

Key to UOIT's ability to teach the courses that make up the graduate diploma in Nuclear Design Engineering is OPG's willingness to share with the university the simulation software that was developed for each of Pickering A, Pickering B, and Darlington.

OPG trains its own staff with the help of simulators that replicate the appearance of the control room and the response of the generating unit to the full range of operations conducted from the control room.

And, by making the classroom version of these simulators available to UOIT, our students, many of whom work for the various design and service companies in the nuclear sector, gain the valuable knowledge and experience that such educational and training tools make

available.

At UOIT, we are now extending the application of the simulation software to produce close replicas of any of OPG's nuclear generating unit control rooms. As the industry is moving to greater use of consulting and service companies to enhance the design, operation and maintenance of nuclear plants in the most cost-effective way, UOIT is able to provide the specialist education and training in nuclear plant design and operation that is greatly enhanced by the use of these simulators.

By sharing the simulation software with UOIT, OPG is being a friendly neighbour who helps to enhance the educational and career opportunities of people wishing to work or are already employed in the nuclear industry.

In summary, I very strongly support Ontario Power Generation's application for the renewal of the Pickering A and B operating licences for a 5-year term and also to merge the operating licences for the Pickering Nuclear Generating Station.

Thank you, Mr. Chair, for the opportunity to present my views on these very important topics.

**MR. CHAIRMAN:** Thank you.

Monsieur Tolgyesi?

**MEMBER TOLGYESI:** I have one, Mr. Bereznai.

As a Dean, your institution is specialized in energy systems and nuclear science. Are you or were you involved in this subject of black deposits?

**MR. BEREZNAI:** Sorry, the subject of?

**MEMBER TOLGYESI:** Black deposits on a discharge of fuel bundles.

**MR. BEREZNAI:** No ---

**MEMBER TOLGYESI:** You were not? Okay.

**MR. BEREZNAI:** George Bereznai, for the record.

No, I haven't.

**MEMBER TOLGYESI:** Okay, because I wanted to know if you have any comments but, if you are not involved, I cannot ask the comments.

Okay.

**MR. CHAIRMAN:** Dr. Barriault?

**MEMBER BARRIAULT:** Just one brief question really: Would the issue of solar power and wind-generated power -- the amount of back-up -- how much lag time do you have in starting up a back-up system?

For example, you mentioned gas powered as being a back-up because of the transient nature of the wind and so forth, what is the time?

I mean, can you store in batteries, can you



do anything with this wind and solar power?

**MR. BEREZNAI:** George Bereznai, for the record.

My understanding of the bulk electric power system that the operator has data on the best of which they maintain a spinning reserve.

So, based on their experience -- and this is changing as solar and wind come more and more online -- they will have a certain amount of spinning reserve already online which can, almost instantaneously or almost at the same rate as the wind power or solar contribution drops, can pick up the additional load.

And then as soon as that happens, they would be calling the turbine -- gas turbine generators to be building up and pick up those loads.

But I believe the bulk electric system is well-operated to be able to maintain the stability of the system, given the ups and downs of solar and wind, keeping in mind that we still have 25 percent of hydro in Ontario, which is very fortunate to also be very quickly able to respond.

So the combination of hydro and spinning reserve, but again, my argument is that the spinning reserve will be burning typically natural gas which is, (a) a disappearing and very valuable resource that is a

shame to burn, and is still contributing to pollution and climate change.

**MEMBER BARRIAULT:** Thank you.

Thank you, Mr. Chairman.

**THE CHAIRMAN:** Monsieur Harvey?

**MEMBER HARVEY:** About the Institute of Technology, do those courses, those different courses you mentioned, are they mostly oriented to the CANDU technology, or the more general, and -- as those simulator, for example?

**DR. BEREZNAI:** George Bereznoi, for the record.

Basically the fundamental -- the science fundamental behind all nuclear power plants, that is from the nuclear theory to thermal hydraulics, the electric systems, are very similar between the different plants.

At the moment, we use the CANDU technology more as the example on which to base -- to demonstrate the theories. But, as we have simulators for CANDU, we also have simulators for PWRs, VWRs, and even the VVR reactor, so, yes, for now.

Our special mandate at UIT is to be market-oriented. The market for our graduates is principally the CANDU industry, so at the moment we heavily favour those examples, but not at the exclusion of the universally more

common light water reactors. And we are certainly ready to speed up that component, if the decision is to go to light water for any of the new reactors.

**MEMBER HARVEY:** Thank you.

**THE CHAIRMAN:** Ms. Velshi?

**MEMBER VELSHI:** Thank you.

Dr. Bereznai, you've probably seen from a number of intervenors their concerns expressed about extending the pressure tube lights from 210 equivalent full power hours to 240, in spite of what the inspection results or the safety case may show.

Are there any other design lives that you have come across where, in spite of what the shelf life is, or what the original design life was, that the life has been extended after experience running something. I don't -- you know, I can't think whether it's engines, or whatever it is, but where there have been cases of, "Yes, that was the design life, but now that we've got real experience, it's got a longer life to live"?

**DR. BEREZNAI:** George Bereznai, for the record.

My experience would be in the nuclear power sector. For example -- but moving away from the reactor side, for example, the turbine generators have received similar life extension. The large pumps, many of the

valves, whether on the nuclear or the conventional side of the plant, whether Pickering, Darlington or any of the ones around the world, all of these are assessed from time to time; the data is shared amongst all the utilities and users around the world, and therefore there's a very strong database on the basis of which to make estimates.

Now, if you're referring to the fact that estimate are not guarantees, you're perfectly right, but that's why the depth -- the many layers of safety are built into these power plants.

And, as was mentioned by the CNSC staff member earlier this afternoon, even when the unanticipated break, the fairly large break, of the pressure tube occurred at Pickering at the time, even that could be safely handled.

Our both online and offline non-destructive examination techniques have improved greatly since that early accident, and I maintain that compared to all the risks we all take in every day modern life, the precautions taken to make sure that the pressure tubes, the feeders, and all other critical components of Pickering, will at least last safely until -- until the designated lifetime.

I personally believe and wish that further extension will be in place, because to my mind, the

alternative to shutting down Pickering are vastly unattractive from an environmental point of view.

**THE CHAIRMAN:** Anybody else?

You hear from the intervention, not everybody loves nuclear, there's a lot of angst and concern.

Does the university consider part of its mandate to outreach to the public or is it strictly focused on the education?

**DR. BEREZNAI:** George Bereznai, for the record.

I was very intrigued by some of the intervenors, who, it seemed to me, genuinely would like to have more public information.

Not unlike the CNSC, we are under budgetary constraints where it's very difficult to do too much of that. It is part of our strategic plan going forward. I'm on research leave at the moment, and I hope to pick up on some of the topics that I heard discussed, both here and at the Darlington hearings.

I just have to see how far we can stretch, both my own time limits, and those of my colleagues.

But I empathize, you know, with a number of the intervenors who are genuinely concerned about nuclear in general, and Pickering power plant's extension in

particular.

And to the extent that we should be putting on some continued education courses, if you like, you know, "Nuclear for the General Public", it is something that I have been considering for quite some time, and as soon as my other day-to-day duties allow it -- I have just stepped down as Dean so hopefully I'll have a little bit more time.

It is something that I have considered, but again, as you heard from the local communities that are involved in the Pickering area, very few members of the public actually reach out and attend these day-to-day meetings or monthly meetings.

So I commit to you in the next two years to put on at least one course and see if we get at least 20 people, which is sort of our critical mass to make it worthwhile. Personally, I think it's something that ---

**THE CHAIRMAN:** I think you can recruit 20 right here.

**DR. BEREZNAI:** So I gather. I have the names.

**THE CHAIRMAN:** Thank you.

**DR. BEREZNAI:** Thank you.

**THE CHAIRMAN:** Thank you very much.

Our next submission is by Women in Nuclear

- Canada, as outlined in CMD 13-H2.37.

And I understand that Ms. Cottrill will make the presentation?

Please proceed.

**13-H2.37**

**Oral presentation by**

**Women in Nuclear - Canada**

**MS. COTTRILL:** Thank you.

Good afternoon, President Binder, Commission Members, and the members of the public.

My name is Cheryl Cottrill; I am the Executive Director of Women in Nuclear - Canada, or WiN - Canada, for short.

With me here today is Stephanie Smith, Assistant Operations Manager for Pickering 5 to 8, and a WiN Durham member.

We are here representing 1,200 WiN members across Canada, the majority of whom work in power generation, and many work at Pickering.

Our organizational goals are to educate ourselves so we can better educate the public, provide professional development and support for women working in the industry, and promote careers in the industry and

science to young women and girls.

WiN believes educating our members about all aspects of the industry provides them with the information necessary to help educate our family, friends, and the public, providing an opportunity for the public to make informed decisions about whether or not they support our industry.

In an industry made up of less than 20 percent of women, our organization works not only to provide a collective voice for women, but to help women succeed by supporting leadership programs directed at woman.

WiN members, including OPG employees, devote a great deal of their spare time working with young women and girls, introducing them to non-traditional but rewarding career choices in science, technology, and skilled trades.

One of the programs we run is a girl's science club and camp, designed to spark a life-long love and curiosity of science. It also encourages girls to develop, maintain, or continue their studies in science.

We also partner with Skills Canada each year to reach over 1,400 young women, aged 12 to 18, and introduce them to well-paying trade and technology positions in our industry.



These programs work to change the perception of the industry from male-dominated to diverse-friendly, and strengthen the talent pipeline to ensure the industry is attracting the best and the brightest.

The industry is very supportive of our programs and events, enhancing the advancement of women, and highlighting the important role that women play.

Our members come from very diverse backgrounds of work experience and education, and are involved at every level, from maintenance, operations and radiation technicians, to the role of Vice-President.

We work at a nuclear generating station by choice, and many of us live in the communities surrounding the station.

As highly skilled workers, we could work in any industry, but choose to work in nuclear because we know we are helping to produce safe, reliable, low-carbon baseload power that is an important part of Canada's clean energy portfolio.

We all understand our responsibility to work safely, not only to protect the safety of our fellow workers, but to also protect the environment and the communities in which our families and friends live.

Safety is the number one priority in everything we do at the station. This strong culture also

transfers over to our activities outside of work, at home and in our volunteer activities in the community.

**MS. SMITH:** Good afternoon. Stephanie Smith, for the record.

Many of our members have raised their children close to Pickering. As moms, we worry about many issues facing the safety and wellbeing of our children. The fact that we live close to a nuclear station is not an issue that keeps us up at night.

We would not work in this industry and live in these communities if we did not feel it was safe to do so. The safety of our family, friends and communities comes first before our chosen careers. We would simply never put them at risk.

Pickering nuclear has been safely operating for more than 40 years. Just recently, we celebrated 10 million hours without a loss-time injury. This is something for Pickering that we are all proud of and is a record for Pickering.

OPG has invested more than \$100 million in additional inspections and maintenance to ensure the station continues to be safe and reliable to the end of its last day of operation.

In the CNSC's Annual Nuclear Station Performance Report, Pickering Nuclear continues to meet or

better perform in all safety-related areas.

Following events in Japan, OPG confirmed Pickering station was safe and had appropriate systems and procedures in place in the likely event of a significant emergency.

Using lessons learned from the industry, OPG has implemented additional equipment and procedures to add an even greater layer of safety to the Pickering site.

Pickering plays an important role in Ontario's nuclear generation by producing 13 percent of the electricity needed across the province.

We know nuclear power is the workhorse of energy production in Ontario and provides baseload electricity which is responsible for providing power to our parents and our grandparents in nursing homes, the friends when they require hospital care and our daily use from our morning coffee to running the dishwasher.

Our busy lives rely on a steady, reliable supply of electricity and we are thankful to have over 50 percent of the electricity in Ontario come from nuclear.

As women, we are concerned about the legacy we are leaving for our children and grandchildren. We know nuclear-generated electricity produces virtually no greenhouse gas emissions and does not contribute to climate change.

The Canadian Energy Research Institute, an independent non-profit research institute, analyzed greenhouse gas emissions from various power generation sources. They concluded that the energy generated from nuclear power plants results in emission levels that are much lower than coal, oil and natural gas, and are similar to those of wind, solar and hydro.

Currently, there are more than 3,000 people working at Pickering. This represents a considerable, economic contribution to the community. We would like to see our community's young people remain in the area for employment. These highly-skilled jobs will provide our families and friends with a good standard of living while working in a safe environment.

There is a great economic value in nuclear. In terms of operational costs, nuclear is one of the most affordable, large-scale forms of energy.

**MS. COTTRILL:** Cheryl Cottrill, for the record.

Our members are highly-skilled workers and would not be working in this industry if we did not believe in the technology and its safety. It is important to all of us when we leave for work in the morning to know we will return safely at the end of the day and our families and friends who live in our communities will be

safe each and every day.

I personally have raised my two children within eight kilometres of the Bruce site. At no time have I ever worried about the safety of my children living in close proximity to Bruce Power.

**MS. SMITH:** Stephanie Smith, for the record.

I joined what was then known as Ontario Hydro as an engineer in 1990. In 2006, after four years of extensive training, I became the first woman to be certified by the CNSC as a shift manager on Pickering 5 to 8.

In this role, I am responsible for the safe operation of four nuclear reactors and the safety of the plant employees, public and the environment.

I was very proud to take my two daughters to work on "Take Your Kid to Work Day" and have them go back to their class and say, "My mom runs a nuclear power plant".

Staff are encouraged to voice concerns, provide suggestions and raise questions. Differing opinions are respected. OPG has supported my work with WiN, encouraging me to speak at schools, and I write on their blog encouraging young women to have a career in technology.

Because of our day-to-day interaction with the nuclear industry and our strong belief in the expertise of OPG employees and their proven history of safe operation, WiN-Canada supports OPG's application before the Commission.

**THE CHAIRMAN:** Thank you.

Question? Monsieur Harvey?

**MEMBER HARVEY:** Well, you just gave us your feeling about the fact you're working in a nuclear station and when you are anywhere and meeting somebody who are not aware of that and you mention that you work at the nuclear station, what is their reaction? Are they surprised or asking questions and things like that?

**MS. SMITH:** Stephanie Smith, for the record.

For the most part, my neighbours and friends and my children's friends, in particular, ask me what it's like and once I explain what I actually do, they think it's -- especially the teenagers think it's really cool so.

**MEMBER HARVEY:** Thank you.

**THE CHAIRMAN:** Anybody else? Question?

You know, if you look at the list of intervenors, there are a lot of organizations speaking for women. We have Women in Nuclear, Women in Ontario, Women

for Peace, et cetera, and they all have different opinions.

Are you a member in any one of the other organizations?

**MS. COTTRILL:** Cheryl Cottrill, for the record.

No, I am not a member of any of these other organizations.

**THE CHAIRMAN:** So when they say they speak for, let's say, Women of Ontario, they don't speak on your behalf?

**MS. COTTRILL:** They do not speak on my behalf personally and I would probably be okay in saying they don't speak for the majority of our members as well.

**THE CHAIRMAN:** Okay, anybody else?

Well, thank you. Thank you.

I'd like to move on to the next submission by the Métis Nation of Ontario, as outlined in CMD 13-H2.130, and I understand that Mr. Bowler will make the presentation. Please proceed.

**13-H2.130**

**Oral presentation by the  
Métis Nation of Ontario**

**MR. BOWLER:** For the record, I'm Mark Bowler from the Métis Nation of Ontario.

My role is Director of Lands, Resources and Consultations there. I'm here with my colleague Hank Rowlinson who will share some of the presentation with me today.

The Métis Nation of Ontario would like to thank the Nuclear Safety Commission and for the opportunity to submit its comments pertaining to the relicensing application of the Pickering Nuclear Generation Station.

On April 6<sup>th</sup>, 2013, through the collective efforts of the OPG and MNO, the Métis Nation of Ontario, and the Canadian Nuclear Safety Commission, an information-exchange event was held at the OPG Information Centre in Pickering.

The findings from the information exchange imply that while OPG's presentation provided an appropriate amount of information and level of detail, one information-exchange event is not sufficient to provide thorough understanding of the site's functioning processes and initiatives.

Additional dialogue between the OPG and the Métis Nation of Ontario and the Métis citizens would be of benefit as it would allow the community to adequately



evaluate the Pickering Nuclear Generation Station's effects on the environment in relation to the Métis way of life and the Métis interests and better reflect their concerns and recommendations.

The Métis Nation of Ontario would like to be involved in planning and implementing strategies that the Pickering Nuclear Generation Station is developing to offset fish impingement and entrainment.

To mitigate the effects of the thermal plume, a partnership between OPG and the Métis Nation of Ontario would be beneficial to assist the efforts that are underway and in development to mitigate the impacts on the aquatic ecosystem.

The health of the aquatic ecosystem is of great concern to local Métis citizens and they would like to share their expertise with OPG so that the goal of no loss to aquatic life as a result of the site's operation can be achieved.

Ensuring that the fish species in Lake Ontario are not affected by operations of Pickering Nuclear Generation Station is part of the stewardship responsibility that local Métis citizens have expressed that they feel.

The MNO would like to -- would like the CNSC and OPG to continue to engage with its citizens in

regard to the Pickering nuclear station.

Additional information exchange events would help build more meaningful and positive relationships with local citizens and increase their capacity to apply their knowledge, both traditional and contemporary use of resources, to matters concerning Pickering nuclear station in its initiative.

I will hand it over to Hank Rowlinson.

**MR. ROWLINSON:** Hank Rowlinson, for the record.

The MNO, the Métis Nation of Ontario, was founded in 1993 by the will of Ontario Métis. The Métis Nation of Ontario represents the collective aspirations, rights, and interests of Métis People and communities throughout Ontario.

The Métis Nation of Ontario has a democratic province-wide governance structure. Every four years, Métis citizens have the opportunity to choose their provincial and regional leadership by voting in province-wide box elections.

In addition, community councils have been established throughout the province. They get their mandate to support local governments from the Métis Nation of Ontario through signed community charter agreements and work collaboratively with the MNO and other community

councils to represent the rights and interests of regional rights-bearing Métis communities throughout the province.

As the only recognized provincial Métis governance structure in Ontario, the Métis Nation of Ontario has advanced the Métis rights agenda through the precedent-setting *Powley* case.

The Métis Nation of Ontario has established bilateral and tri-part processes with the federal and provincial governments and in November 2008 signed an Ontario Métis Nation Framework Agreement with the Government of Ontario.

The Métis Nation of Ontario also has a negotiated accommodation agreement with the provincial government on Métis harvesting rights.

Since its formation, the Métis Nation of Ontario has been dedicated to the goals that have been identified in the Métis Nation of Ontario's Prime Purpose.

The Métis Nation of Ontario, through its province-wide infrastructure, delivers a range of programs and services in the areas of health, labour, market development, education and housing to approximately 73,000 Ontario Métis and other Aboriginal groups. More than 150 people work in the Métis Nation of Ontario in 19 offices throughout the province.

Since its adoption in 1995, the Statement

of Prime Purpose has been affirmed many times and remains the foundational document of the corporation.

Statement of Prime Purpose. We, the Métis People of the lands which give rise to our history and tradition and culture, we call those lands the Métis Homelands. The Homelands stretch from the lakes and rivers of Ontario, cross the wide prairies, traverse the mountains into British Columbia into the north and reaches the Northwest Territories. They include the hills and valleys of the north-central American states.

These are our lands. These are Métis lands. They are the lands of our past, which nurture us today and which value us the precious foundation of our future.

As Métis who live in the Homelands, we hold to be a fundamental truth that we are one of the Aboriginal People of America.

The Métis Nation of Ontario continues today to be the embodiment of our past, the source of subsistence for our present, while giving rise to our hopes and aspirations for the future.

We are a nation borne of independence, of self-sufficiency, whose teachings are founded on the values of honesty and truth.

We are proud of our rich heritage. We are

inspired by the values and traditions of our ancestors. The strength of our society is based on democracy, freedom, fairness, equality, generosity, justice, and the customary and written law of our people. Above all, we cherish harmony and peace.

As Aboriginal People, we hold sacred the rights of the individual and the collective. We have respect for each other, for the land, and for the animal and plant life that surrounds us.

We are a people who honour and respect the family, our Elders who hold the key to the past and our children who are our future.

Guided by the spiritual values, we aspire to attain our highest potential. We now -- therefore, we declare as follows:

We, the Métis Nation, are a distinct nation among the Aboriginal Peoples in Canada and, as such, our Aboriginal and treaty rights are recognized and affirmed under Section 35 of the *Constitution Act* of 1982.

We, the Métis Nation, have the inherent right of self-determination and self-government.

We, the Métis, who live within the Métis Homelands of Ontario, desiring to bind our people together to collectively promote our common, cultural, socio-political and economic wellbeing, have founded the Métis

Nation of Ontario to be our representative body with the following aims and objectives:

To research, publish and promote genealogical documentation of the Métis and to establish and maintain a registry of the Métis citizens of Ontario;

To establish democratic institutions based on our inherent right of self-government;

To encourage the full participation of all Métis in the Métis Nation;

To promote and foster community development;

To re-establish land and resource bases;

To develop prosperity and economic self-sufficiency within the Métis Nation;

To provide care and support necessary to meet the fundamental needs of the citizens of the Métis Nation;

To promote the improved health and wellness of the individual, the family and the whole Métis community;

To establish effective means of communication for the Métis Nation;

To encourage academic and skills development and to enable citizens of the Métis Nation to attain their educational aspirations;

To promote the history, values, cultures, language and traditions of the Métis Nation into greater awareness of our proud heritage;

To promote Métis artistic and cultural achievement;

To ensure that Métis can exercise their Aboriginal and treaty rights and freedoms and, in doing so, act in a spirit of cooperation with other Aboriginal and non-Aboriginal People;

To establish good relations with all Aboriginal Peoples for the pursuant of our common interests and goals;

To continue our affiliation with the Métis National Council for the representation of our interests, of the Métis Nation of Ontario at a national and international level;

And, to gain the recognition and respect of Métis as a nation of people.

**THE CHAIRMAN:** Sorry to interrupt, but you realize we have read this document. You don't have to read the whole document from cover to cover.

**MR. ROWLINSON:** Okay. I'll let you go on then for that.

**MR. BOWLER:** Okay. Mark Bowler, for the record.

So, typically, in a consultation situation, my consultation team would conduct a traditional knowledge and land use study. And we didn't conduct such a study in this case because the Pickering Nuclear Generation Plant is existing and would certainly displace activities related to harvesting and knowledge that is related to and connected to the land base here.

So we did some studies in determining, well, how connected are the local Métis People to the nuclear power plant, how concerned are they and how do they feel about the opportunities to get involved in, in particular, maintaining the ability of Métis into the future to exercise those rights and activities that may be integral to the Métis identity.

And so that's really what from the land resources and consultation side that my department wanted to look at; is regardless of whether or not there's a decommissioning in 2015 or 2020, there will be a decommissioning someday of Pickering nuclear facility.

And the Métis People want us to be involved in planning that so that they could make best use of the land, water resources and plan for those ecosystem components that they rely upon and have relied upon for generations in the area, so that they can continue to exercise their identity as a people.



And that's also what you've seen and read. We would like to have the Commissioners consider how the Métis interests can be taken into account in that future period in the planning of decommissioning.

We've heard some interesting debates about decommissioning and the potential for that or the timing, but the key interest in this facility by the Métis people is in how do we get involved in planning, what will happen after the facility because the Métis people are here in the area and will continue to be into the future.

**THE CHAIRMAN:** Let's -- if you're finished, we would like to show this.

**MR. BOWLER:** Sure.

**THE CHAIRMAN:** In fact, that's a good question to hand over to OPG and then to staff about the long-term involvement of the Métis in this particular project.

OPG?

**MR. JAGER:** Glenn Jager, for the record.

I'll ask Kevin Powers to come up in a moment and speak to the details of involvement with the Métis Nation.

But to begin with, I would say we would welcome Métis involvement in the environmental initiatives we have ongoing today in the operation of the power plant

because we are talking about the current operating licence.

We'd also consider -- I think it's a good idea to consider that involvement in the proposed use post-2020 and decommissioning plan. So we'll take that as input.

Now, I'll ask Kevin to speak further on the involvement going forward.

**MR. POWERS:** Kevin Powers, for the record. I'm the Director of Corporate Relations and Communications.

And OPG is committed to building a long-term mutually beneficial working relationship with the Métis Nation of Ontario.

To that end, we have had recent discussions with the Métis Nation of Ontario and we have committed to a number of things. Included in that is a commitment to continue to engage in information briefings and exchanges on our continued operations, on decommissioning, on nuclear waste management and future projects.

**THE CHAIRMAN:** What about -- I think there was mentioning also, before getting to this, this is only decommissioning, what about fish management?

**MR. POWERS:** Yes. So -- sorry, I just referred to the -- I was referring there to the

decommissioning.

We have also committed to the Métis Nation of Ontario to explore opportunities for active involvement of Métis citizens in our fish mitigation efforts.

**THE CHAIRMAN:** Are you happy with that answer?

**MR. BOWLER:** It's Mark Bowler from the MNO, for the record.

And yes, we are happy with that answer. It is what the participants in our meetings suggested was a good way forward. And there's no way we could speak for the great diversity in opinion on nuclear power and these sorts of things or we don't have the capacity for engineering pipe safety.

We have plenty of learned individuals around at the level 2, bring those forward. So we wanted to make sure that we brought forward the ability of and the commitments going forward for the Métis Nation to participate in the planning forward.

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

Anybody else?

Monsieur Harvey?

**MEMBER HARVEY:** Do you have an idea how that will be implemented? Do you have a schedule or some idea of the regularity of the meeting, of the contact,

such a thing?

**MR. POWERS:** Kevin Powers, for the record.

We have begun recently to build on our already good existing relationships with the Métis Nation of Ontario. As we continue to build on that, we will begin to develop the framework for how we will engage in those ongoing discussions.

**MEMBER HARVEY:** Thank you.

**THE CHAIRMAN:** Thank you.

Dr. McDill?

**MEMBER MCDILL:** Thank you.

What would a full traditional knowledge and land use study entail?

**MR. BOWLER:** It's a good question. So what we do is a little bit different from some traditional land use -- traditional use studies and land use studies, in that we interview people with contemporary knowledge of the land.

So those that are actively in many of the northern contexts trapping, hunting, fishing, gathering of plants and these sort of things, and many of our members still do that and do that on a regular and social basis. So that they get together to do that in groups for hunting and fishing and they provide for their families throughout the province.

So what we do is we get our lists out, of citizens, and we start to interview them and record the interviewing information on GIS type maps and compile the information so that we have a general idea of what areas are best for and what species are used and indicate sort of a healthy co-existence of both Métis and ecosystem components, those ecosystem components being moose or pickerel or some other species that might be important.

We're developing that throughout the province in a single database with lots of Proponent's help and support and provincial and federal, where there's new project development in the eventual case that we'll be challenged on whether or not there's such thing as Métis and Métis use and rights in harvesting.

So really, we're developing a master database for the whole province. And so in that typical case, because the Pickering nuclear facility is existing, it's quite difficult to do that because certainly somebody would notice a harvester walking around with a rifle on your -- on your secure site.

**MEMBER McDILL:** Or indeed a moose.

**MR. BOWLER:** Yes.

So it's one of those things that it wasn't the most relevant way to study the interests of the people, but we know from all of those other studies what

are those ecosystem components and I can refer to one done for the Darlington connection, where there's many medicinal and consumptive plants listed that are used in that area.

And so we can judge by proxy a certain amount of use and values that are used in the -- to consider for valued ecosystem components in an evaluation of these things.

So what we're interested in is making sure that Métis values are brought forth when things are studied and when plans are put forth.

**MEMBER McDILL:** And do you feel you have sufficient knowledge to do that, that your request was, for example, moving forward into a decommissioning phase, do you have sufficient knowledge at this time?

**MR. BOWLER:** It's Mark Bowler again.

We think that in this area, it's developing. That the knowledge -- there's a great resurgence and interest in Métis way of life components and things and there's a great deal of study going on.

And we do think that the -- as participants, there'd be something valuable to share for OPG and around the station and that sort of thing.

But we also don't just rely on ourselves. If the valued ecosystem component is perhaps wild rhubarb

or something, or a type of berry, then we would also use the best scientific and ecological capabilities possible to make sure that we were planning for that to be, you know, a fixture of the landscape and considering also, say soil components and things like that as blueberries don't like anything but acidic soils.

So we don't just rely on the traditional knowledge or that empirical knowledge that's developed over time, we rely on everything that we can, based on those values. We do rely on the values and they are developing -- our knowledge of the values for this region are developing all the time.

**MEMBER McDILL:** Thank you.

**THE CHAIRMAN:** Anybody else?

Just -- I was intrigued by the survey data included in there. I know it's a relatively small population, but it's very encouraging because you've got a pretty good support for that kind of consultation.

I guess I'm looking at Appendix C.

**MR. BOWLER:** Yes, we do have good support and I'm always encouraged and pleasantly surprised when people come out to engage, whether it's planting trees or they roll up their sleeves and get involved. You know, our -- I'm pleased that our citizens take it very seriously.

**THE CHAIRMAN:** Thank you.

Any other final word?

Okay, thank you, thank you very much.

We will take a 15-minute break, five to four; we're on a tight schedule.

--- Upon recessing at 3:39 p.m./

L'audience est suspendue à 15h39

--- Upon resuming at 3:56 p.m./

L'audience est reprise à 15h56

**MR. LEBLANC:** We are ready to start. Thank you. You look ready. I talked -- people in the back of you, they don't seem ready.

**THE CHAIRMAN:** Okay, we are ready to start. Could you please -- okay, the next submission is by Go Solar Canada, as is outlined in CMD 13-H2.26. And I understand that Mr. Holtl will make the presentation. Please proceed.

**13-H2.26**

**Oral presentation by**

**Go Solar Canada**

**MR. HOLT:** Dear Commissioners, I believe



that the continued interest in this province, whether it be through refurbishment, new builds or running nuclear reactors beyond their designed lifetime is misguided.

Heavily subsidized nuclear energy has passed its time, as has the bottomless pockets of Ontario taxpayers in the name of cheap energy.

I take it -- I urge you to take a deep look at yourselves as well as the industry you're -- you regulate, my point being, why are we making electricity with a technology that is so dangerous that we need a Commission to regulate it when there are exponentially safer alternatives?

I ask, is the CNSC about the safety of the public or the safety of the industry?

If you are about the safety of the public, then if you see safer ways of producing energy, ways that are in good parody and feasible, you'll put -- pull yourselves away from producing electricity in dangerous ways. After all, we don't make hockey pucks out of plutonium because we have reasonable alternatives.

Due to enormous costs of large scale generation facilities, it isn't feasible for private interests to build large generation stations. The reason is the energy produced would seem to cost many more times than what we pay for our energy today because we would see

the entire price.

Since cheap energy drives industry, governments around the world have stepped up and subsidized the energy sector by paying for the actual generator at a cost of many billions of tax dollars and then leasing it to a company to run and administer.

The electricity produced is further subsidized by setting minimum generation amounts to keep the facilities profitable. This keeps the aura that energy is cheap since the government pays minimums, again, with tax dollars, as opposed to from your hydro bill.

When you get your hydro bill, you're paying a small portion of the cost of the administration of the facilities, not the actual cost of the power. What you see on your bill is just a drop in the bucket. What you really pay comes off your paycheque every week in provincial taxes.

With the introduction of the FiT and MicroFiT program, generation facilities are required to purchase, install and run their own generators. Some of these renewable generators are required to be up to 60 percent Ontario content, bringing renewable energy manufacturers to Ontario, creating much needed manufactured and skilled labour jobs.

Since the generating facility has to

purchase has to purchase the generator, along with covering the cost of upkeep for 20 years period of the contract, the price paid for electricity reflects the true cost of electricity since there are no subsidies and no tax dollars at work. The price paid for the electricity is the cost to produce the electricity.

These prices will be higher than heavily-subsidized large generators since the actual generator is not initially purchased by the government and there are no minimum generation allowances.

When introducing a new program, sometimes government will sweeten the pot to get the ball rolling. In the first year of the MicroFiT, 80.2 cents was paid to the pioneers who went ahead and purchased systems for their rooftops. This price is necessary to create interest since the prices were high and there was only one module manufacturer in Ontario.

Now there are many module manufacturers, inverters, racking systems and the balance of parts required to keep the Ontario content. Once system prices came down, so did the tariff, now at 54.9 cents per kilowatt hour, and as systems continue to fall, so will the tariffs.

With safety requirements becoming more stringent and stockpiles of fuel needing to be dealt with,

the cost of nuclear power is rising.

If you ask the Minister of Energy, how much does a reactor cost, he won't be able to tell you. Go ahead and ask. He doesn't know the true cost because the process is so complex. This is according to George Smitherman, our past Energy Minister.

The price paid for electricity from big generators is around 5 cents per kilowatt and up, sometimes hitting well over a dollar and sometimes \$2 if the energy is imported, depending on the load on the system. During the higher load -- loads, prices go up. On a hot sunny day, it's much more than the 12 cents or so that you pay on your bill.

When peaks are hit and electricity has to be imported, the prices go up even higher, making the 54.9 cents per kilowatt hour paid for by solar cheap.

So it's a nuclear industry that says they do not work on subsidies, a \$30 billion plus price tag is a lot of money for refurbishment.

If this money was used to purchase and install solar modules on people's rooves, homes and farms instead of renting -- instead, renting roof space at 3.3 kilowatts per hour, another, say, 3.3 could be given for storage of the power, our electricity costs would at least level off. This would give us an equivalent cost of a

steady 6.6 cents per kilowatt hour as compared to a nuclear facility's minimum 3.3 and up.

When we have a solar spill, we call it a nice day. When we have a nuclear spill, it costs us hundreds of billions of dollars.

Renewable energy has one big problem, storage. The sun doesn't always shine and the wind doesn't always blow. Fortunately, we humans are a crafty bunch when we need to be. With the cost savings from overruns, another 30 billion or so would be available. With just a fraction of this put into research and development of electrical storage facilities, the problem can be minimized or eliminated. We are already seeing old mine shafts being pressurized and factories full of high efficiency batteries.

Here's your choice; fill the mine with compressed air or radioactive isotopes.

In the future, since more cars spend 90 percent of their time sitting in the driveway, we'll have millions of electric car batteries on standby.

They say that our hydro is going up because of upgrades needed to accept renewable energy. These upgrades are necessary anyways to maintain a robust and up to date distribution system.

These upgrades are mainly to accommodate

the implication of the new smart meter system. The smart grid is needed for the smart meters. With smart meters, the powers that be can tell what you're doing in your home. They can tell what kind of appliance you're running and when.

These impositional upgrade costs are being covered up using renewable energy. The upgrades are needed whether we have renewables in the mix or not.

Most renewable generators are located where the power is used, freeing up large, costly transmission lines. When the electricity flows through a wire, there are losses; the greater the distance, the greater the loss. We're talking metres between most renewable sources and the load -- and the load, and kilometres between the big generators and the load.

Distributed generation has the lowest losses and is therefore more efficient.

Below I put together a scenario of what Go Solar Canada could do with \$30 billion paid at \$3 billion per year for 10 years at today's system prices. That makes this a very conservative estimate since I'm sure costs would go down once they order a couple billion modules.

We could install 520 10-kilowatt systems per day or 130,000 systems per year for a 10-year total of

1.3 million 10-kilowatt systems. We could put 6,260 people on the roofs of every working day for 10 years with four complementary jobs for every boot on the roof creating a total of 25,000 jobs per year for 10 years.

We could produce 42,000 megawatts of average per day, with an average peak of 10,500 megawatts, a summer high peak of 15,000 megawatts and a winter's low peak of 4,200 megawatts.

The tariff for these systems could be set low since there's little or no maintenance, the cost -- aside from the cost of the rental space for the roof.

Since a generator is now subsidized, a rate of no more than 3.3 cents per kilowatt hour would pay -- be paid to the host roof. This would provide the host roof with up to \$500 per year for the use of the space that is not normally used.

We are seeing that off-grid system sales are on the rise. Once the price drops below the cost of expensive nuclear, everyone will be going off-grid, leaving the province with a bunch of expensive, dangerous mothballs.

In the end, it's the big multinational companies that win when it comes to large generators. General Electric has come out and admitted that nuclear power is a thing of the past, although if somebody wants a

reactor, they're more than happy to sell it to them.

When it comes to renewables, it's you and I that win. Helping farmers and homeowners pay their rent seems like a better way of using tax dollars for creating energy in a responsible manner.

Thank you.

**THE CHAIRMAN:** Thank you.

Questions? Who wants to go? Anybody?

First of all, you did hear my statement at the beginning of the hearing that we do not deal with policy issues associated with weather, wind, solar or nuclear.

**MR. HOLTL:** Yeah.

**THE CHAIRMAN:** Okay. So you should make this pitch to Ontario government.

**MR. HOLTL:** Well, I guess I'm asking is what are your -- what does the CNSC stand for; the people or -- the safety of the people or the safety of the nuclear industry?

**THE CHAIRMAN:** Whatever -- if the applicant comes to us, we have to determine that the operation that they propose will continue to be safe. We are not whether they should continue to exist or not.

**MR. HOLTL:** Okay. Well, I am fine with that.



**THE CHAIRMAN:** Anybody else want -- okay, thank you.

**MR. HOLTL:** Thank you.

**THE CHAIRMAN:** Thank you very much.

I would like to move to the next submission by Canadian Nuclear Society, as outlined in CMD 13-H2.61, and I understand that Mr. Roberts will make this presentation. Please go ahead.

**13-H2.61**

**Oral presentation by**

**Canadian Nuclear Society**

**MR. ROBERTS:** Thank you, Dr. Binder.

For the record, this is John Roberts speaking.

Good afternoon, Mr. President, ladies and gentlemen of the Canadian Nuclear Safety Commission. My name is John Roberts and I am the President of the Canadian Nuclear Society. With me is Mr. Colin Hunt, the Secretary of the Canadian Nuclear Society.

By way of introduction, the Canadian Nuclear Society is the learned society of Canada's nuclear science and technology community. We have over 1,000 members drawn from virtually all areas of Canada's nuclear

science and engineering infrastructure.

Our purpose is communication to aid the spread of accurate technical information about nuclear science and engineering technology among Canada's nuclear energy professionals and to interested members of the general public.

As a volunteer society, we undertake this through a number of programs, including technical conferences, support for public and university education, and a small but effective scholarship program.

The purpose for which we are gathered today is the perspective renewal of the operating licences of the Pickering A and B Nuclear Power Stations and the combining of those licences into one operating licence.

I do not propose today to critique specific aspects of the technical safety performance of the Pickering A and B Nuclear Generating Stations. Ontario Power Generation has submitted its application, along with the technical information to support it, and the Canadian Nuclear Safety Commission staff has provided its response.

Instead, my purpose here today is to highlight the importance of the Pickering Nuclear Generating Station and the renewal of its operating licences.

The safety decisions made by the CNSC

should be made in the context of their importance and the significance to the welfare of Canadians to the economy of Canada and Ontario.

It should be clearly understood that all human activity contains some element of risk. An activity as simple as turning on a stove to boil water in a kettle contains some risk of injury.

We tolerate these risks for two reasons: one, that the risk is relatively low in absolute terms; and two, that the activity undertaken provides benefits.

This principle applies to the operating of the nuclear generating station as well at Pickering.

Our submission to you outlines in some detail the benefits provided by the operation of Pickering, benefits which citizens in Ontario began to enjoy 42 years ago, and to this day the absolute risk of the operating reactors has remained acceptably low while the benefits have remained disproportionately large.

There are those who suggest that Ontario has alternatives to the use of nuclear power; such a claim is false.

Ontario, unlike British Columbia, Manitoba and Quebec, has no large undeveloped hydraulic resources. Ontario, unlike Alberta and Saskatchewan, has no significant reserves of fossil fuels.

In fact, since the 1950s, Ontario has had only two significant sources of new electricity generation: imported fossil fuels or nuclear power. These facts are just as true today as they were in the 1950s. Geographic facts do not change, except over geologic time.

The provision of reliable, economic electricity in large quantities has been and continues to be an essential component of Ontario's economic life. It is safe and clean kilowatt-hours produced at competitive costs and to a dispatchable schedule which power Ontario's households. Reliable electricity constitutes a large part of Ontario's industrial strength.

So it is the view of our society that the decisions made by the CNSC are not purely abstract questions of safety. These decisions made by you have direct economic and physical consequences for the lives of millions of people.

Our society accepts that the absolute risk of the operation of Pickering is acceptably low and the benefits provided by it are extremely high.

I look forward to any questions you may have regarding our written submission or my statements here today.

**THE CHAIRMAN:** Thank you.

Who wants to start? Mr. Tolgyesi?

**MEMBER TOLGYESI:** In your submission, you are mentioning the electricity sources. There is no mention on solar.

**MR. ROBERTS:** I'm going to ask my colleague, Mr. Hunt, to address that question. Thank you.

**MR. HUNT:** That information would be found as a subset of Table 2 in our written statement. This is where we use the 2009 World Electricity Production figures. Solar would be a very tiny fraction of that indicated under "other".

**MEMBER TOLGYESI:** And do you have any projections or forecasts or educated guesses what will be eventually this new energy tax which will come in? I'm talking about wind, solar or potentially other ones?

**MR. HUNT:** I would prefer not to engage in speculation. Those are things that are very difficult to count.

What you can do is say what can we see of the future by what we understand of present countries' or jurisdictions' stated intentions now. In other words, what do they say now that they are going to do in the future with respect to energy supply, writ large or electricity supply in specific?

We can look at various databases which are

codified by the OECD or the IAEA, and one of the things which comes out is that the largest sector or largest area of the world in which energy is going to grow, in terms of per capita availability, is Asia; Asia, generally, but in particular, China and India.

With respect to nuclear power, both of those countries have indicated that they have under construction and in planning very large nuclear reactor fleets, China alone intends to have an additional 400 reactors built and in operation before the middle of this century.

So all of us alive, all of us in this room today can expect to see some large part of that expansion.

That's the equivalent of, by itself, doubling the number of power reactors in the world. That's just China.

India has indicated that it plans, and it is building the infrastructure, like China, to introduce in the service more than 100 reactors over a similar period by the middle of this century.

So I cannot say what their total energy scope is going to look like, but what I can say is these two countries, based on what they've already committed in terms of science R&D and what they have committed in terms of financial structures, and what they have committed in

terms of education and engineering schools and development, and what they have started to commit in terms of dedicated or allocated sites for nuclear, we can say that there are going to be about another 500 reactors in those two countries alone within the next half century.

**THE CHAIRMAN:** Anybody else?

Ms. Velshi?

**MEMBER VELSHI:** You mentioned in your written submission that this is the first time you're intervening in a licensing process. What makes this license application different for you?

**MR. ROBERTS:** Well, it's an excellent question. It's John Roberts, for the record.

As a learned society we have had discussions over various years within the society as to whether or not there should be intervention, and it was considered that it was lobbying.

I took it on myself to get a legal interpretation of lobbying and the legal interpretation of lobbying is if you are behind closed doors doing something for your benefits or for the benefit of someone that you know, that is lobbying.

If you are in a public forum that is being broadcast -- as in here today -- it is not lobbying. And therefore, I was able to persuade my counsel, my board,

that we should be intervening because, in my opinion, the health of the Canadian Nuclear Society is directly tied to the health of the Canadian nuclear industry. So we should be supporting the Canadian nuclear industry in order to help the health of our society.

So yes, there's a little bit of gain there for the society, but it is not lobbying. Therefore, legally we can do it.

**MEMBER VELSHI:** So we'll be seeing you a lot more often then?

**MR. ROBERTS:** Hopefully yes, and hopefully you'll find this an enjoyable experience.

**( LAUGHTER/RIRES )**

**MEMBER VELSHI:** I hope you find it enjoyable as well.

If I look at Table 1 in your written submission where you give the performance over the life of the different reactors and the Pickering, all six units, their performance is probably in the bottom quartile.

Perhaps this is a question more for OPG. As you look at extending the life of these reactor units, what do you anticipate your capacity factor to be over the -- you know, up to 2020?

**MR. JAGER:** Glenn Jager, for the record.

Our business case assumes about a 74 or 75



percent capacity factor. Currently, the performance of the station is performing very well.

Last -- for the first quarter of this year, we had a forced loss rate of just over 2 percent, which exceeds our performance targets and, in fact, exceeds the original performance expectations of the Pickering A units, in particular.

So performance of the plant is improving. We feel we can easily satisfy the business case for operating the Pickering plant right out through 2020, even with the significant investment of continued operations of \$200 million.

So roughly, \$200 million includes plant upgrades, the fuel channel life management program, investment, and all the research associated with that, for 3,100 megawatts and the performance expectations that we have and we're currently achieving, definitely make it a good value for Ontarians.

**MEMBER VELSHI:** Thank you.

And I'll ask the CNS, but perhaps staff can help.

As we look at the Pickering units and you look at nuclear reactors around the world and their age, are the Pickering units kind of at the bottom 10 percent, in the middle of the pack, when it comes to how old the

reactors are?

**MR. ROBERTS:** There's still one Magnox reactor working in the U.K., Wylfa, that's -- I suspect, around the same age as Pickering.

Beaver Valley in the States, does anybody know the year that that went into power? But that was in the early seventies, I think. They're still running; they got new boilers but that plant is still running.

I don't know whether your staff members can help out on that as well?

**MR. HUNT:** Colin Hunt, for the record.

I would make a couple of observations to start with. Outside of Britain, Pickering was the first multi-unit station, certainly the first multi-unit station under one roof ever to go into service.

It is still one of the oldest multi-unit station operating anywhere in the world. There are very few multi-unit reactor sites operating before Pickering Units 1 and 2 started up in 1971.

So one -- what one can conclude from that is it is truly remarkable testament to the original design concept of the station; that we have experienced so much in terms of development and requirements placed upon nuclear safety performance, that Pickering can continue to be considered for operation today, meeting the safety

standards, not of 1971, but the safety standards of 2013.

And that, I think, is something remarkable to think about. There are many -- there are many pieces of technology, nuclear technology which were developed in the 1950s and 1960s, many of which have been abandoned subsequently.

The British have largely abandoned any thought of building new gas-cooled reactors, for example, and no one in Russia is ever going to build or design another RBMK-type reactor.

CANDU is one of the very few reactor technologies which is able to meet a safety case today based on an original design and construction concept from the mid-1960s.

**MEMBER VELSHI:** Thank you.

Staff, do you have anything to add around age, relative age of the Pickering units?

**DR. RZENTKOWSKI:** I don't know the exact -- Greg Rzentkowski, for the record.

I don't know the exact statistics of the reactor fleet world-wide, but there is one fact worth discussing.

In the United States, we have more than 100 reactors in operation. They are typically licensed -- actually, they are licensed for 40 years. Many of the

reactors have been recently relicensed for another 20 years.

So this tells me that a large part of U.S.-based reactors have been put in operation in the early seventies, mid-seventies, and they have been relicensed for another 20 years or more.

Very often they have been uprated as well. So that means they now operate at around 120 percent power.

So if we look at the data, showing lifetime performance, this could be very misleading because some of the reactors in the United States, also in Europe, are running at more than 100 percent power, and 100 percent was the power rated at the initial stage of design and construction of the plant.

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

**THE CHAIRMAN:** Can I jump on that?

So those plants in the U.S. that we hear continuously about life extension, do they display the same aging issue that is being discussed here and, you know, is it something that one learned from their experience?

**DR. RZENTKOWSKI:** From the design standpoint, PWRs is a pressurized water reactors and the boiling point reactors are simpler, simpler than CANDUs.

So in terms of the aging, the main component affected by aging is really the reactor vessel. And there were a number of instances when the reactor vessel degraded to the point that required very strong intervention on the part of U.S. regulator.

However, the recently -- the regulator noticed other problems because the uprating requires significantly higher flows in the heat transport system than the reactors were originally designed for, and this is leading to flow-induced vibration problems, in particular, in the steam generators and other components in the system.

So they have many -- many events which are caused by the flow-induced vibration.

Of course, they can be controlled but, nevertheless, they impact on operation. Not on safety yet, but they impact on operation.

**THE CHAIRMAN:** But I guess what I'm looking for, do they -- I understand it's a different design between CANDU and some of the American systems, but they must have also some engineering shelf life that says: "Okay, you were designed for 40 years but, you know what, we've looked at it now and we allow you to go on for 60."

I think that somebody behind you wants to help.

**MR. RZENTKOWSKI:** As I indicated before, the lifetime or shelf life of the reactor was purely an economic decision at the point when the reactor was designed, because, you know, the return on investment required that the reactor has to operate for 30, 40 or 60 years, whatever the number was.

And in the United States, this number was 40 years and, now, the safety case is being reassessed for most of those reactors and their life has been extended by 20 years.

However, this extension is predominantly a paper exercise, looking at the safety case, running numerical codes, confirming the safety margins. It's not like here in Canada when, very often, we require the licensee to assess any potential improvements which can be implemented, and put them in place before -- before we agree for long-term operation of a plant.

**THE CHAIRMAN:** Mr. Frappier, you want to add to this?

**MR. FRAPPIER:** Thank you.

This is Gerry Frappier. I'm the Director General of Assessment and Analysis.

First off, there is lots of reactors around the world that are in this sort of vintage, let's

say, to start off and, as Dr. Rzentkowski said, in the United States they certainly have lots that are 40 years and are looking to go beyond that.

From an engineering perspective, we have lots of interactions internationally to exchange data both on research that's being done at different facilities, whether it be in the U.S. or in Europe or anywhere else for that matter, to look at some of the components of ageing that we've talked little bits and pieces about here: how corrosion happens, what sort of things are happening to metal, to concrete, how to analyze those things from a systems perspective, provide new tools for analysis beyond what was available in the seventies and that.

So all of us are learning from each other with respect to how to regulate going forward but, most importantly, is the science has progressed a lot and there's been lots of research for many, many decades now in getting ready for this.

So we do interact, but they do have lots of the same issues that we have. The designs are different, as Dr. Rzentkowski said, but some of the basic sciences and engineering and engineering tools, are the same.

**MR. JAGER:** If OPG could comment?

**THE CHAIRMAN:** Please.

**MR. JAGER:** Glenn Jager, for the record.

The IAEA, with about 40 or more reactors worldwide that's over 40 years old, and I'll ask Mark Elliott to comment in greater detail about our ageing management, but our continued development of the continued operations plan for Pickering drew in all the OPEX as well as EPRI standards on ageing management, and information that's available from other utilities in developing those plans, and managing the extension of the Pickering B plant.

And I'll ask Mark Elliott if he'd like to comment further.

**MR. ELLIOTT:** Mark Elliott, Chief Nuclear Engineer, for the record.

There's been a lot of discussion about assumed design life. The assumed design life of Pickering was 30 years. It was an economic evaluation at the time we built Pickering. It was engineering -- engineering concurred with that evaluation.

But what's really important is that we don't exceed any design limits, and Pickering will not exceed any design limits by 2020.

We've talked a little bit about



concrete. Let me just tell you one thing about pressure tubes. Pressure tubes, one of the ageing management mechanisms with pressure tubes is it picks up hydrogen and potentially makes them weaker as they pick up hydrogen.

The design limit codified in the CSA Standard today is 100 parts per million of hydrogen. Today, Pickering is at 53 parts per million of hydrogen and, by the end of 2020, will be around 80.

So we will not exceed the current or even approach the current limit, design limit, and there's many other examples I could give where Pickering doesn't reach the design limit.

There was a comment about pressure tube burst. We've actually aged the pressure tubes beyond 100 ppm, up to 120, which would be several years beyond, and did burst tests in a hot cell lab and the pressure tubes were strong and met all requirements up to that 120.

So there is significant margin in the Pickering pressure tubes and, overall, Pickering doesn't reach any design limits.

**THE CHAIRMAN:** Thank you.

I think we need to move on. Thank you for your intervention and we'll look forward to you coming again.

I'd like to move on to the next

submission, which is an oral presentation from -- sorry, is an oral presentation outlined in CMD 13-H2.8.

I understand that Mr. Seitz will make the presentation? Please proceed.

### **13-H2.8**

#### **Oral presentation by**

#### **Mr. Seitz**

**MR. SEITZ:** Thank you very much for allowing me to speak here.

I've been concerned about the proliferation of nuclear applications ever since the early '60s.

In the '50s, I was involved with physics, and I grew weary of that because I felt that that science wasn't acting like a science at the time, but more like a cult, as though they were owned by the militarists, and we all know what their occupation entails: the butchering of their fellow human beings.

I don't think we've really gotten beyond that. I feel we are still being cultic and not sufficiently scientific because, if we were, we would look at some very basic facts.

The facts I want to present are ones that are long-term, because I'm not directly involved in

the nuclear applications, nor would I ever have any desire to be.

Albert Einstein made a statement, when he saw what types of applications his knowledge was put to, and that statement was this, he said:

"I would have never lifted a pencil had I known."

Too late, Mr. Einstein.

So I'm here to tell you today why I'm calling for the abolition of all nuclear fissioning applications, not just here at Pickering, but everywhere else on this planet -- but this is the only one I am close to, geographically.

First, nuclear waste is the only real product of nuclear fissioning and it lasts forever. Prior to nuclear fissioning, we had maybe 13 or 14 unstable elements in the periodic table. With the advent of nuclear fissioning applications, we have over 1200 more. This sounds like a real witch's brew.

After 70 years of producing more and more nuclear waste, we're no closer to removing nuclear waste from our environment than we were at the time when it all began, namely, with the Manhattan Project. Since the time of the Manhattan Projects, we earthlings have produced over a quarter million tons of high-level nuclear

waste.

Closer to home, we here in Ontario have already produced over 46,000 tons of high-level nuclear waste. It seems to be that our CANDU reactors are very good at producing nuclear waste, along with their 30 percent electrical efficiency, the other 70 percent being radiated off site heat.

We could rightfully say that we Ontarians have been living in the era of nuclear waste production. It is time to bring this era to a close, and I think as soon as possible. And, of course, that involves government and politics, and I'm saying this publicly so that maybe they will hear it too.

It's simply wrongheaded to think of burying nuclear waste as a way of removing it. One major reason is that over 90 percent of all the earth's living biomass is found below the earth's surface, one example being that of the Kola hole drilled in Russia during the time of the Soviet Union. They went down 42,000 feet and lo and behold they found there were anaerobic life forms there.

We have no way or means of measuring or knowing how our actions might be jeopardized seeing the other 90 percent of planet earth's life forms. Are we also deciding to put it in danger of extinction along with

our known life forms?

We're already proven wrong to think of nuclear waste as something we can simply bury and forget. This has never been done anywhere, an example being the Hanford Nuclear Station where it all began, plutonium production.

The nuclear waste has been and continues to break down and destroy any material containment that we can devise.

At Hanford, radioactive contaminants are already threatened the whole Columbia River Basin. We need to face and accept these facts.

With nuclear waste, there's no known possibility for just removing it, and after some 70 years of experience, we simply do not possess the requisite scientific knowledge nor the wherewithal to undo all the nuclear waste we have already created here on planet earth.

As responsible people here today, we know that we're all obliged to come up with ways to manage this nuclear waste.

It has been produced on planet earth's surface, and methods for its management, I believe, in light of the aforesaid, will also best happen on planet earth's surface. It can't be buried and forgotten.

I believe the presence of and continued production of nuclear waste has already brought us into a new time where we must first acknowledge and take ownership of this self-inflicted responsibility.

Our responsibility is for the perpetual management of nuclear waste. There will be no end to this. It would be like as though I had a cancerous wound on my body and if I wanted to go on living, I would have to look after it.

So long as human civilization chooses to continue on earth, all the nuclear waste we have produced will require perpetual management. Management to keep it from escaping into our commons and bringing the pathologies onto all life forms, wherever it escapes. I know of no life form that thrives on nuclear waste.

Of all nuclear stations, Pickering stands out because it has a far greater amount of nuclear waste stored here than at any other nuclear station I know of.

By having produced and now saddled ourselves with the responsibility for storing 25,000 tonnes of high-level nuclear waste, this is far greater than the now defunct Fukushima station where they have lost control.

Like Chernobyl, Fukushima station is another open sore upon our biosphere, not unlike my

analogy of cancer.

We must choose to cease all further production of nuclear waste because if you weight it, the coming perpetual costs for managing it alone will far outweigh any further accountings for refurbishment and production of yet more nuclear waste.

Now, on a positive note, we can choose to say that we're on the threshold of a new era; the era of nuclear waste management because from here on the choice of what kind of future we are the creators of truly is ours.

Thank you very much for listening.

**THE CHAIRMAN:** Thank you.

Comments, questions, anybody?

Okay, thank you. Thank you very much.

We will move now to the next submission by the Lake Ontario Waterkeeper, as outlined in CMD 13-H2.29.

And I understand that Ms. Bull will make the presentation.

**13-H2.29**

**Oral Presentation by**

**Lake Ontario Waterkeeper**

**MS. BULL:** Good afternoon, Mr. Chair and

Members of the Commission.

Thank you for the opportunity to speak today about OPG's application for a five-year licence extension for the Pickering Nuclear Generating Station.

My name is Joanna Bull; I'm here on behalf of Lake Ontario Waterkeeper, a grassroots charity dedicated to the vision of a swimable, drinkable, fishable Lake Ontario.

My main submission is this; unless OPG addresses the ongoing and unreasonable destruction of fish at Pickering, it should not be allowed to continue operating.

Once through cooling water systems are the most environmentally damaging of all existing cooling technology. But of all the places where this bad technology is used on the Great Lakes, Pickering is the absolute worst.

Pickering is the oldest nuclear power reactor in Canada. Its nuclear system is antiquated -- or its cooling system is antiquated. It was built at a time when natural resources seemed abundant, and no one thought there could ever be a decline in fisheries in a lake as big and full of life as Lake Ontario.

But in the decades since Pickering was built, that's just what's happened. The Great Lakes are



in a state of upheaval. Invasive species, loss of benthic invertebrates, and the cumulative impacts of sewage, industrial pollution, leaking landfills and spills have all put fish at risk.

These cumulative impacts make the ongoing and unnecessary killing of millions of fish, fish eggs, and larvae at Pickering even more of a pressing issue.

If nothing is done to reduce impingement and entrainment at Pickering, the next seven years of operations will kill approximately 434 million fish eggs and larvae, through entrainment and approximately 1.12 million fish by impingement, and that's with the fish deterrence net in place.

Fish impinged at Pickering include the endangered American eel and the round whitefish, a species of concern in Ontario and to Environment Canada.

Our request today is simple; do not issue a licence that allows OPG to continue to kill millions of fish.

This is not a new idea. In fact, the CNSC made this request itself in 2008. In October of that year, the CNSC issued a request to OPG under Section 12.2 of the General Nuclear Safety and Control Regulations. You first identified achievable targets for reducing impingement and entrainment based on information from OPG,

CNSC staff, and DFO.

According to the CNSC at the time:

"The ongoing fish mortality at Pickering constitutes an unreasonable risk to the environment, as OPG has not met its obligations to take all reasonable precautions to protect the environment. [...] This conclusion is based on the level of ongoing impingement, entrainment, fish mortality, and on the fact that OPG has failed to implement available mitigation measures it identified in March 2003, in the course of its Fish Impingement/Entrainment Management Program."

Specifically, the CNSC stated that:

"The best available technology for minimizing adverse impacts of entrainment and impingement on aquatic organisms can reduce impingement mortality of all species by 90 to 95% and total entrainment by 60 to 90%".

OPG was directed to meet those targets by

2012.

To its credit, OPG took steps to reduce impingement through the installation of a barrier net during warm weather months. They deterred many fish species, including the brown bullhead with that net.

However, Pickering continues to impinge northern pike and other fish during winter months when the net is removed. And as of April 2013, OPG has not reduced entrainment at all, let alone by 60 to 90 percent.

Contrary to their 2008 finding that reducing entrainment by 60 to 90 percent is feasible, CNSC staff now accept OPG's assertion that there is no cost effective technology or operational measure to reduce entrainment.

The major fish kill problem at Pickering is a licensing issue. In order to grant OPG's requested license under the *Nuclear Safety and Control Act* the Commission must be satisfied that OPG will make adequate provision for the protection of the environment and human health and safety.

Five years after they were first issued, the targets identified as feasible in the CNSC's 12.2 request have not been met. Instead of attempting to meet the targets, OPG says they're not able to make adequate provision to protect the environment at Pickering and intend to pay for habitat projects elsewhere instead.

In documents before this Commission the significance of Pickering's fish kills are downplayed because the remaining life of the plant is short.

But seven years of industrial operations is only short if you compare it to the decades long operating life. Any other Proponent seeking approval to operate for seven years would be required to take every available step to protect the environment and human health and safety.

During the 2010 Pickering A licence renewal hearing, Mr. Chair, you noted that at the current rate of progress Pickering may reach the end of its life with a nice engineering study but no solution.

Three years later it appears that that is exactly OPG intends to do.

Pickering has been killing massive numbers of fish since it first came online. OPG has known about the fish kills the whole time. They have collected dead fish at the plant's intake for more than four decades.

The only reason that options to stop or reduce fish kills are still theoretical in 2013 is OPG's failure to implement them decades ago and, the CNSC's failure to require their implementation.

The relatively short remaining lifespan of the plant cannot justify decades of inertia. If the Commission allows this plant to operate for seven more

years without implementing the measures it deemed feasible to reduce fish mortality from entrainment it will be a continuation of that ongoing failure.

Lake Ontario is aquatic and fish habitat. It's a place for recreation. It is the only source of drinking water for 9 million people.

Waterkeeper believes that Lake Ontario can be restored and protected but it requires good decisions by those with the privilege and the responsibility for making them. And in this case as is often true on this lake, you the Members and Chair of this Commission are the people with that privilege and that responsibility.

We urge you to make the right decision for Lake Ontario and everyone who cares about the lake and relies on the lake.

Make the same good decision you made in 2008. Make it binding as a licensing condition. Decide that OPG must address fish kills at Pickering or cease operations.

Ensure that they follow through this time and soon or your own words will be all too prophetic. This plant will end its life with a pile of studies and no solutions.

Thank you.

**(APPLAUSE/APPLAUDISSEMENTS)**

**THE CHAIRMAN:** Thank you.

Who wants to go?

Monsieur Harvey?

**MEMBER HARVEY:** First question, when we are talking of 434 million fish, eggs and larvae and 1.12 million fish in the next seven years, what is the -- starting from there, what is the relative importance of such mortality, taking into account the reproduction rate of Lake Ontario, natural reproduction rate?

So I don't know I could maybe ask you the question and after that to the staff and OPG. I know it's important for you ---

**MS. BULL:** M'hm.

**MEMBER HARVEY:** --- but what is the relative importance?

**MS. BULL:** I think the numbers speak for themselves in terms of the law forbids killing of any fish without a license under the *Fisheries Act*.

This is an incredible number of fish that are being killed on a daily basis. OPG often -- OPG and CNSC staff often turn to lake-wide impacts to try and diminish those fish kills and deflect from the sheer number of fish that are being killed.

I would caution you that when you're looking at those numbers and then you hear lake-wide

impacts, you can't look at lake-wide impacts unless you are going to look at cumulative impacts of everything that's affecting fish and killing fish on the entire lake.

So when you're looking at the plant you look at how many fish the plant is killing. If you're going to try and diminish that by looking at lake-wide impacts, at that point you need to have to added up every single source of pollution, every single source of fish kills. So I hope that puts that in context.

**THE CHAIRMAN:** I think it is a good time to see if DFO people are tuning in or here in the room.

Is -- they are really -- they are -- okay.

What I'm confused about I thought that that particular issue of the net is being accepted by DFO and by the CNSC staff and by OPG.

So somebody, please, let's -- starting with DFO, what the intervenor is saying you're nowhere near the deal. So what's going on?

**MR. HOGARTH:** Tom Hogarth, Fishery and Oceans, for the record.

As far as when we look at the numbers of impingement, and that's when we're talking about the barrier net, CNSC had requested it, an 80 percent reduction and so the solution for that 80 percent reduction was the barrier net and so DFO has been

providing expert support to CNSC in review of that information and we concur with OPG and CNSC that they've met that target of an 80 percent reduction in impingement.

**THE CHAIRMAN:** Okay. So first of all let's start with this; you will never accept that number?

**MS. BULL:** DFO has just addressed impingement alone.

**THE CHAIRMAN:** Okay.

**MS. BULL:** The problem with entrainment -- there was a target of 60 to 90 percent entrainment reduction and that target hasn't been met or even come close to approach.

**MR. HOGARTH:** Again, DFO has been providing expert support to CNSC on that issue. And so with target of 60 percent, studies were to see if there is a mitigation measure so for DFO we always prefer a mitigation measure first before offsetting. And based on technologies available, lifespan of the existing facility, it was determined that there was no mitigation measure which was acceptable to put in place and we reviewed that and we accepted that as well.

The next step for us in our review then and for CNSC is what is the next step, if you can't mitigate this impact how else can you do.

So we provided expert -- again expert



support to CNSC on how would you go about offsetting. So what we did was we looked at the numbers of the -- of entrainment numbers and based on the numbers of fish that are being entrained into the plant we provided advice to CNSC and OPG on how much coastal wetland you would need to produce the same or an equivalent number of fish to meet that target.

So that's our support, was in providing that kind of expert information based on CNSC's acceptance of the amount of wetland that's being created, DFO looked at that as well and we concurred that with the amount of wetland being produced it would, in a sense, provide the offset for -- to meet the 60 percent target.

The other thing for DFO on this one is the -- there's been an issue over how long mortality is occurring. Well, one thing that DFO looked at by producing there may have been other methods for straight mitigation but at -- right now with the advantage of doing the offset in the creation of coastal wetland, even long after the plant is closed, that coastal wetland that was created will continue to produce fish.

So it's another way of -- you know -- adding to the fish populations, to the diversity of fish populations long after the plant is closed.

**THE CHAIRMAN:** Ms. Bull?

**MS. BULL:** I'd just like to highlight that that answer featured prominently the focus on the remaining lifespan of the plant. And again, as I said, the remaining lifespan of this plant can't be used to justify a failure to mitigate.

**THE CHAIRMAN:** That's not what I thought he said. He thought that -- if I understood what he said, there's going to be some benefit beyond the life.

**MS. BULL:** What I took from that answer was mitigation is always better for the ecosystem than offsetting, and I would agree with that statement.

So DFO looks to mitigate before they look to offset.

In the case of Pickering, when they looked to mitigate, they found no reasonable mitigation measure given the short remaining lifespan of the plant and the cost of mitigation.

So those are the factors that are limiting us here. It's not a lack of potential mitigation measures.

**THE CHAIRMAN:** Would you like to reply. or staff?

**MR. HOGGARTH:** Yeah, I'll just reply again, and specifically to the content of DFO in this, in that our first choice is always mitigation but it doesn't

always mean that mitigation is always better.

And so, again in this example, when we look -- when you look at the cost of what mitigation measures would be, if you can put some of those costs into the creation of new habitat, it will last longer. In reality, you'll be getting better bang for your buck that way.

**THE CHAIRMAN:** Okay.

Monsieur Harvey?

**MEMBER HARVEY:** Well, I didn't have an answer to my question about the impact on the lake. Does it have any impact on fishing activities on the lake?

**MR. HOGGARTH:** Again, Tom Hoggarth, for the record.

So is the question does the amount of mortality that's occurring at the lake -- or occurring through Pickering result in a decreased fishing opportunity in the lake?

**MEMBER HARVEY:** Well, I mean, I would like to know the impact of that on the lake, on the fish, on the ---

**THE CHAIRMAN:** It's the percentage relativities, this kind of thing, if I understand correctly.

**MEMBER HARVEY:** Would the fishing activities on the lake survive to death?

**MR. HOGGARTH:** No, when we look -- so there's multiple ways of looking at what the impact of something like this is.

And so, in example, the numbers that are being quoted, so if we look at 17 million eggs, so you want to make a decision or determine what is the impact to 17 million eggs or what does that mean to the production of fish within the lake.

And when you look at -- and we'll use the alewife here as an example. Alewife are what they call a broadcast spawn. They're a fish that the way they survive is by depositing as many possible eggs over a large area as possible because there's a huge mortality rate within their survival rates.

So with 17 million eggs being deposited, the reality of that is it only produces about 600 fish after a year. The mortality rate, once the eggs hatch, is almost 99.9 percent on a daily basis until the first winter.

So again, there is production lost by removing the 17 million eggs because that produces 600 fish. The 600 fish, if you look at numbers, they all produce 50,000 eggs each. So there will be a production loss.

When you look at the numbers of alewife

within Lake Ontario, it's a small number. It's a real small number. It's hundreds of millions of -- and trillions of alewife within the lake. So it's not -- for a species like alewife, it's not that big of an issue.

And the intervenors spoke to the issue about be wary about looking at lake-wide populations. It makes sense to look at lake-wide populations when you're speaking to alewife because it is one homogeneous lake-wide population.

The literature doesn't demonstrate that. You know, most people understand, with salmon as an example, they return to the same stream year after year after year. And so if you remove the habitat in one stream, you can have the potential impact of wiping out a population. Alewife aren't like that. They haven't shown any fidelity to a specified area for spawning.

So it makes sense on a species like alewife to look at it in a lake-wide population, but we haven't made our decisions for all the fish that way.

**MEMBER HARVEY:** Thank you.

**THE CHAIRMAN:** Okay.

**MS. BULL:** Can I?

**THE CHAIRMAN:** Just a sec, you'll get the last word.

**MS. BULL:** Thank you.

**THE CHAIRMAN:** Dr. McDill? Anybody?

Dr. Barriault?

**MEMBER BARRIAULT:** Thank you, Mr. Chairman.

On the issue of the net, how much of the year is the net being used? I'm going to ask OPG.

**MR. JAGER:** Glenn Jager, for the record.

The net is removed in November and redeployed in April. And I would just say that, as you saw in their opening presentation, we've improved that technology since its initial deployment. We bettered the targets set by the CNSC for impingement by improving that technology and working very hard on the effectiveness of that net.

While the net is deployed, it takes almost daily maintenance to ensure the net remains effective, and that's what we do. We have divers out in the lake almost every day of the week, ensuring that the net is effective to safeguard the fish and prevent impingement when we can safely deploy the net.

So we are pleased with the results. It's taken a lot of effort and it's taken quite a bit of ingenuity from the engineering and supporting contractors that we have used for the fish net and we will of course continue to monitor its effectiveness and report on its use.

**MEMBER BARRIAULT:** The reason for removing it is because of ice formation or does it block the intake of water, or is it the fact the maintenance of the net is a problem because of the cold water?

**MR. JAGER:** Glenn Jager, for the record.

I would say all of the above. During the winter months, because, as I said, the net requires daily maintenance, it is not safe for the divers to maintain the net. So if it were out during the winter months, we couldn't safely deploy the divers to maintain and ensure its effectiveness.

The second issue is, during the winter months, there is ice on the lake. It can impinge on the net and, again, damage it and basically prevent its effectiveness.

Third thing I would say is the net is an engineered control measure. Reactor safety is a consideration and the net does require maintenance to ensure its integrity so that it does not impinge on the plant and create a reactor safety issue.

So, you know, all those things combined -- and we benchmarked this with other utilities and similar installations that have deployed an intake net. This is what they do as well. So all those things combined, in answer to your question, are really factors that reach the

decision to remove the net during the winter months.

**MEMBER BARRIAULT:** Thank you. Thank you, Mr. Chairman.

**THE CHAIRMAN:** Ms. Velshi?

**MEMBER VELSHI:** I think this is a question for staff. You said -- or perhaps maybe I'll start with DFO -- that the entrainment mitigation measures were deemed to not be reasonable given the remaining life of the plant.

If at that time when that decision was made that the life was going to be five years longer to 2020, would those mitigation measures have then been assessed as being reasonable options to follow?

**MR. HOGGARTH:** It's Tom Hoggarth, for the record.

I think CNSC would probably be in a better position to answer that question.

**MR. WISMER:** Don Wismer, Environmental Risk Assessment Specialist, CNSC.

There's a number of potential technologies for entrainment mitigation, but the one that the U.S. EPA has singled out as the most likely for use at stations is to put in fine mesh travelling screens and the problem with that affects the survival rate of the fish that's entrained a lot. The alewife is still quite low.



So the way it works is you put these screens in and then the fish go into troughs and then into slices and then into pipes and then they end up going back into the lake. And if they go back into the lake stunned, then they'll just get eaten up.

I was involved in this kind of a system years ago at Thunder Bay and it took years and years of tailoring it to get the fish to survive the system. So it just didn't seem to make a lot of sense in this instance.

And the rules in the U.S. are under review and they're supposed to be issued in final form next month. And what they are saying now about entrainment that has changed since 2008 is that's a really site-specific decision. They are not sticking with the 60 to 90 percent rule anymore.

They're leaving it up making it a site-specific decision.

**MEMBER VELSHI:** So with that change, would that decision be any different for the site-specific needs here?

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

Perhaps before Mr. Wismer adds information, in 2008, when the CNSC issued the 12-2 request, it was based on work that had been done in the U.S. by the U.S.

EPA and with the targets that had been identified.

We have since then gotten the efficiency for fish impingement that we were requesting that OPG put in place for entrainment. We've just explained that the technology that would have been the most feasible is not effective in all cases and it takes a lot of work to make it efficient.

With the expected new rule, essentially, we would not have chosen the same type of target for entrainment and would have looked at more site-specific solutions and the site-specific solutions that are now being put forward in terms of habitat offset would have been considered much earlier.

**MEMBER VELSHI:** Thank you for the clarification because what had been stated earlier was that the mitigation was deemed unreasonable because of the remaining life of the plant as opposed to that, technologically, it made no sense because it would not be effective.

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

As Don Wismer explained, given the fine tuning that the technology would require over a fairly lengthy period of time and the remaining life, then it's that decision of putting in place something that's very

costly, taking a long time to make it work and then the plant shutting down.

**MEMBER VELSHI:** Okay, so you still haven't answered my question.

If this was assessed in 2008 and there was still 12 years of life left as opposed to 5 or 7 -- and we're talking about an extension of life -- would that mitigation measure have made sense to have followed through?

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

I'll ask Don Wismer to provide you with additional detail keeping in mind that with -- as Mr. Hogarth has mentioned, with the habitat offset, you get ongoing compensation beyond the plant operation.

But Mr. Wismer will provide the further details.

**MR. WISMER:** Don Wismer.

It would only make sense if there was a species of conservation status involved and we felt the technology wouldn't end up just killing the fish anyways and we've discussed that in the context of Darlington refurb and that situation there that there would have to be one of the special species before you'd go down this route because the technology is so difficult to get it to

work and to not harm the fish.

**MEMBER VELSHI:** Thank you.

**THE CHAIRMAN:** Anybody else?

I got -- first of all, on your Recommendation 1, we didn't talk much about this timely publication of emissions.

What did you have in mind? I thought that those emissions are posted; are they not?

And maybe you can elaborate and then I ask OPG what's the intentions here.

**MS. BULL:** M'hm. Not to my knowledge in a comprehensive and we've had a lot of trouble with FOI requests obtaining that information, particularly around spills.

The spill in December 2009, we went through the FOI process for months and still never got any information from OPG.

So if that information was just made public as a matter of course, in a very simple straightforward way the public could access, that would save everyone a lot of time and allow the public to actually be engaged and informed as opposed to having to have specialized knowledge in order to go through the FOI process and the money to do that.

**THE CHAIRMAN:** OPG?

**MR. JAGER:** Glenn Jager, for the record.

We do publish our emissions and our spills. I'll ask Raphael McCalla, our Environmental Director, to comment further.

I would also like to add that we had zero consequential spills during the licensing period. So our performance is quite good in this area but, nevertheless, we do endeavour to make all the necessary reports.

**MS. REUBER:** It's Barb Reuber, Vice President, Environment.

As Mr. Jager said, we have achieved excellent spill performance at Pickering with no serious or very serious spills, but any spills, even of the less-serious variety are immediately reported to the Ministry of the Environment Spills Action Centre and the CNSC and, in addition, courtesy notifications are provided to the municipality.

If we were to experience a serious or very serious spill, then processes are in place to communicate with the public as appropriate.

With respect to emissions data, we make our emissions data available to the public through the publication of an annual radiological, environmental monitoring report which is posted on our Web site.

**THE CHAIRMAN:** Are you happy with that

answer?

**MS. BULL:** I have not found the data that I've been looking for in the past, but if OPG says that it's available, I will double-check again and if I can't find it, I can ---

**THE CHAIRMAN:** You've got a name.

**MS. BULL:** --- always take it up with them.

**THE CHAIRMAN:** The last question I have, it's a bit of a -- I thought you mentioned that -- do you know how many power -- how many NPP exist on Lake Ontario?

**MS. BULL:** How many, sorry?

**THE CHAIRMAN:** How many nuclear power plants or power plants on Lake Ontario?

**MS. BULL:** On the Canadian side, there are two.

**THE CHAIRMAN:** The American side.

**MS. BULL:** At least two on the American side.

**THE CHAIRMAN:** The lake, presumably, is shared by all; right?

**MS. BULL:** Of course, yeah.

**THE CHAIRMAN:** So are you monitoring their performance because I recently, not too long ago, read an article -- American article that compliment OPG on the net and said that every American site should do the same

thing.

**MS. BULL:** And ---

**THE CHAIRMAN:** So I'm just ---

**MS. BULL:** And we agree, they should do the net everywhere and they should go above and beyond and meet the other ---

**THE CHAIRMAN:** So do you pitch your same kind of a solution to the American side that's what I'm trying ---

**MS. BULL:** Yeah, we recently commented on the Fitzpatrick Nuclear Station.

We work regularly with waterkeepers in the U.S. including on their policy and regulatory advancements. They're a lot further ahead than we are. New plants in the U.S. can't build once through coolers.

**THE CHAIRMAN:** I'm not talking about the new plant. I'm talking about the existing.

**MS. BULL:** Oh, no, I understand and ---

**THE CHAIRMAN:** Did they -- did any one of them put in also a net?

**MS. BULL:** Not to my knowledge.

**THE CHAIRMAN:** Hum!

**MS. BULL:** But they are working now on retrofitting all of their existing plants.

**THE CHAIRMAN:** So do you know how much fish

do they kill?

**MS. BULL:** Similar numbers, yeah.

**THE CHAIRMAN:** I mean ---

**MS. BULL:** I don't have that data in front of me.

**THE CHAIRMAN:** Okay, you have the last word.

**MS. BULL:** Thank you.

Well, there are a number of things I wanted to go back and address.

So Mr. Hoggarth used alewife as a species of a good example. I'd say you can't limit your analysis to alewife, but they are a good example.

The reason that they produce so many fish is because of that high mortality rate which makes killing those fish eggs all the more of an issue. That's a big problem when a species actually has adapted to the fact that so many of their eggs die and then we go and kill more of them.

I would ask for more examples around species of concern like Round Whitefish, the American eel. I had the opportunity to tour the Pickering Plant a few years ago and the day that we were there -- I don't know that it was a coincidence -- we happened to see an impinged American eel. Those are, you know, the kind of



species that are really going to benefit from added protection.

In terms of the cumulative impacts and the lake-wide populations effects, the reason that I cautioned you not to be distracted or deflected by references to lake-wide impacts or lake-wide populations is not because that's not relevant data, it's because if you're going to look at lake-wide populations, you need to also look at every stressor, every source of mortality, every source of pollution on the lake that's affecting those fish.

It doesn't make sense to look at one pollution source and then say: "But the lake-wide population is fine."

So if you're going to look at local impacts and the number of fish killed from your local plant that makes sense and you're looking at apples and apples. If you look at lake-wide population from one plant and don't look at the other sources of pollution and fish kills, you're looking at apples and oranges.

Thank you.

**THE CHAIRMAN:** Thank you.

I'd like to move on to the next submission by the Clarington Board of Trade and the Office of Economic Development as outlined in CMD 13-H2.39.

And I understand that Ms. Hall will make

the presentation. Please go ahead.

**13-H2.39**

**Oral presentation by  
Clarington Board of Trade and the  
Office of Economic Development**

**MS. HALL:** Thank you. Sheila Hall, for the record.

First of all, good afternoon and thank you to the Commission for allowing me the opportunity to present today.

The Clarington Board of Trade and Office of Economic Development represents approximately 300 businesses in Clarington and the economic development for the Municipality of Clarington.

As a nuclear host community ourselves, we are intimately knowledgeable about Ontario Power Generation's commitment to safety in operating their nuclear stations. We also appreciate the reliable generation of cost effective electricity which is virtually free of emissions that harm air quality.

Between our strong partnership with the Ajax-Pickering Board of Trade and staff at both Ontario Power Generation Darlington and Pickering stations, we are

kept well informed of activities in Durham's nuclear fleet. We also have a seat on the Darlington Community Advisory Committee and receive regular updates regarding the Pickering station.

Pickering Nuclear produces about 15 percent of the base-load electricity required to operate homes, businesses, schools and hospitals here in Durham Region and across the Province of Ontario.

They have been an important contributor for more than 40 years and their generation will be a key to ensuring reliable electricity supply during the majority of the refurbishment at Darlington nuclear reactors in Clarington.

The Clarington Board of Trade is also the Office of Economic Development in our community. Durham Region has thousands of manufacturing facilities that rely on reliable electricity that employ multitudes of people.

We -- we need this reliable electricity stream in order to maintain production in these facilities that ensure that they can continue to support thousands and thousands of families in our community.

Ontario Power Generation continues to respect our position and will often seek our input and guidance regarding business matters, in addition to helping provide a strong line of communication between our

business community and both -- at both Darlington and nuclear stations.

We're pleased to see that the Pickering nuclear station continues to meet or better performance expectation in all 14 safety-related areas of the Canadian Nuclear Safety Commission's annual nuclear station performance report -- that's a mouthful.

So in closing, we're pleased to echo the strong support of the Ajax-Pickering Board of Trade for a five-year operating licence renewal for Pickering Nuclear.

Thank you.

**THE CHAIRMAN:** Thank you.

Question?

Thank you very much.

**MS. HALL:** You're welcome.

**THE CHAIRMAN:** Marc?

**MR. LEBLANC:** The next submission was supposed to be by Just One World, as outlined in CMD 13-H2.41. We understand that Mr. Kalevar, the representative of this organization, is no longer available today and has requested to present later this week.

If he cannot present verbally later this week, his submission will be considered as a written submission.

This obviously changes our schedule, so

Sierra Club has accepted to come in earlier than what they were originally planned and present to us at this time,

Mr. President, so we have to jump about five submissions, if you're going through your binders, Members.

**( SHORT PAUSE/COURTE PAUSE )**

**THE CHAIRMAN:** So I guess, as Marc just said, the next submission is by the Sierra Club Ontario, as outlined in CMD 13-H2.129, 129A and 129B.

And I understand that Ms. Elwell will make the presentation. The floor is yours.

**13-H2.129 / 13-H2.129A / 13-H2.129B**

**Oral presentation by the  
Sierra Club Ontario**

**MS. ELWELL:** Thank you. Good afternoon, Mr. President, Commissioners. My name is Christine Elwell; I'm here on behalf of Sierra Club, Ontario and I'm with my colleague Benny Cheng, our science experts.

We are here to make a summary of our submissions on the Pickering application.

I'm bringing greetings to you again from Sierra Club New York. We presented a letter to you, as well as Ministers Kent and Baird today, from Sierra Club,

Atlantic Chapter, New York. Do you have a copy of that letter?

**MR. LEBLANC:** Yes, we do. We received it about half an hour ago. We have not had a chance to distribute it yet, but I recognize it's pretty much a summary of your submission.

**MS. ELWELL:** Yes, sir, although it has been updated with development such as the 2012 Great Lakes Water Quality Agreement. So ---

**MR. LEBLANC:** Will you refer to it in which case, I'll distribute it right away?

**MS. ELWELL:** Briefly.

**MR. LEBLANC:** Okay.

**MS. ELWELL:** Thank you.

So yes -- so our colleagues in the United States are again requesting notice and assessment of the proposal for likely trans-boundary impacts pursuant to the 1991 Canada/U.S. Air Quality Agreement. And, as I mentioned, the most recent amendments to the Great Lakes Water Quality Agreement, Article 5, which specifies that nuclear facilities and nuclear waste are a joint concern of the parties.

And this phrase, "joint concern", is taken -- takes one back to the Air Quality Agreement that says if there is a joint concern, again, this is a reason and

basis for notice and an impact assessment.

The risks of air and waterborne emissions from the regular operations, unintended releases, including catastrophic accidents and decommissioning from Pickering Nuclear are great.

This is the oldest and most troubled nuclear plant in OPG's fleet. Sadly, the root causes of many of the mishaps are unknown and unknowable. I refer you in particular to the December 2012 black deposit event and failures at Unit 1, in our submissions at Section 4.3 where the causes, the root causes of this concern are still unknown.

Unfortunately, as well, many of the major so-called degradation mechanisms to components cannot be avoided or mitigated.

I refer, in particular, to the admission by OPG in Section 4.1 of our submissions with respect to steam generators and pressure tubes.

The fact that the Proponent admits that mitigation is not always possible with these degradation mechanisms is a cause for alarm, especially in view of the Commission's responsibilities to ensure that an application should only be approved where mitigation is possible for likely adverse effects. And again, mitigation requirements are found in the Air Quality

Agreement and Great Lakes Water Quality Agreement.

Instead of extending the operation of Canada's oldest commercial nuclear plant beyond its designed life, we call for the early and orderly decommissioning of it now, that includes a public health and environmental impact assessment, based on protective radiation standards and likely trans-boundary impacts.

OPG's application, supporting materials and a new environmental impact assessment should be posted on a public IJC (International Joint Commission) registry that will allow for cumulative impacts to actually be assessed by the various -- by the various jurisdictions around the Great Lakes.

In our submission, about a third of the paper is -- is devoted to identifying current and expected radiation exposure events. And I -- I won't go through them with you now, I would rather suggest that major ones that need to be taken into account are the admitted increase of 17 percent in collective worker exposure rates in 2012.

OPG admits that the planned outages, the opening of radiation systems for maintenance and repair, as well as decommissioning, will increase the exposure of workers, and therefore the public, to radiation such as tritium.



Commission staff view an environmental assessment of the proposed activity is not required under the current *Canadian Environmental Assessment Act* 2012, but that Act came into effect on July 6<sup>th</sup>, and OPG's application was filed on July 4<sup>th</sup>. Therefore, OPG's application ought to be subject to the more comprehensive 1992 Act that wasn't in force at the time.

Refurbishment and continuing operations and decommissioning are all matters that used to be subject to an environmental impact assessment under the former Act. This happened in 2007 with respect to Pickering, and 2008 with respect to the decommissioning of Units 2 and 3. The extension of this plant beyond its designed life, plus decommission, surely requires the same comprehensive assessment.

OPG admits that the unplanned reactor trips at Pickering are higher than the Canadian average. We've got a significant problem with automatic reactor shutdowns. And, you know, the concern about the steam generator required Commission staff to recommend a 3 percent de-rating.

For all these matters to -- for OPG to admit that many of the mitigation factors for ageing components is not available.

In our view, instead of being able to

determine what the right mitigation factors are and the Commission requiring it, instead OPG hopes to be able to determine the right timing when the component degradation mechanisms become a safety risk that the units must be shut down.

Trying to get the timing right, instead of planning now, for the early and orderly decommissioning of Pickering Nuclear, is irresponsible and contrary to the Commission's domestic law and Canada's international obligations.

My colleague will deal with particulars with respect to concrete. This is a pressing issue, and again, another example of current and expected emission releases.

Turning then to highlight what we've said about radiation protection standards. The CNSC's protection standards of tritium, which is a highly mobile radio nuclei, is, in our view, two or three times less protective than what's achievable in other jurisdictions, and therefore, what is reasonably achievable under the ALARA principle.

We say the ALARA principle, as it's been interpreted by OPG, has distorted the fundamental principle. That principle says where radiation exposure can be avoided or mitigated, that that would be the

leading principle, whereas OPG fashions it about being avoided, social and economic factors being taken into account.

In other words, the Canadian population is expected to be exposed to more radiation because it's somehow considered to be the net economic benefit of us, whereas in other jurisdictions those radiation protection standards are much higher.

There's a wealth of scientific evidence that says the effects of radiation exposure depends very much on the parts of the bodies it's exposed to and the dose factors that come into account. Yet Canadian standards suggest that tritium exposure is just the same as any other medical x-ray procedure. We go into some depth at Sections 6 of our submissions on work in this area.

There are at least 40 recognized international studies showing that the nearness to nuclear power plants increases one's exposure to radiation. While we say there is no safe exposure to tritium, the standards should at least be tightened by a factor of three, to reflect at least the current scientific evidence.

For example, I understand the Commission recently released a report on childhood leukemia and denied any link between the incidents of childhood

leukemia and closeness to nuclear power plants.

This study relies on scientific evidence of general cancers to say many of them are as a result of lifestyle incidents, rather than recognizing that cancers, which are admitted to be higher at Pickering and Darlington, particularly thyroid cancer and leukemia, there we see a higher -- I'm sorry -- we see a higher incidence around those nuclear power plants, and for the Commission study to deny a link and somehow suggest it's related to six year old lifestyles is absurd.

Most recent studies that we quote in our submissions, dating from this year, the U.K. study in 2009, the German study after, show between 12 percent and up to 30 percent increase of exposure -- or incident rate for childhood leukemia near nuclear power plants; and for the Commission's new study to say there's no evidence, no need to investigate further, the precautionary principle doesn't apply, is an affront to the public interest and you Commissioners should not approve that without seriously looking at the science.

And indeed, in your Darlington decision you recognized that there is research being done on dose exposure limits. It would be -- it would behoove the Commissioners to seriously look at that science, given the age of this plant, the admission that emissions will

increase with decommissioning, you know, many souls are in your hands.

So the standards for Canada on tritium and water are really quite lax. At 7,000 BqU for tritium in Canadian drinking water compared to 740 ---

**THE CHAIRMAN:** Can you start winding up, please?

**MS. ELWELL:** --- 740 BqU for United States, 100 for European Union, our standards are out of step.

Yes, I'd like you -- I wanted to answer your question about how many nuclear power plants are on Lake Ontario, and I'm pleased to be able to use this new map from the International Institute for the Concern of Public Health and Great Lakes United, which sets out the incredible amount of loading of nuclear facilities and waste facilities our Great Lakes are subjected to.

And so we call upon the Commission and the Canadian and U.S. governments to have the International Joint Commission do the public registry, as we've suggested, and to focus on nuclear issues, especially nuclear waste issues, which is an emerging matter, especially as transportation across the lakes and our roads, so that a comprehensive solution to this emerging and pressing matter can go forward.

So with those preliminary comments, I'll

turn to my colleague, Benny Cheng.

**THE CHAIRMAN:** We have read this thing cover to cover, so you can summarize in two minutes if you want to talk about the concrete.

We have lots of questions, so don't repeat what you said in here.

**MR. CHENG:** I'll just emphasize the highlights then.

So for the record, I'm Benny Cheng.

One thing I want to stress about is the vacuum building outages examinations. So according to OPG's VBO inspection in 2010, they conducted underwater inspections of the common water intake duct structures. Of the total eight areas planned for inspections, only two areas were completely inspected, two were partially inspected, and four were not inspected at all.

This means only two out of eight areas were completely inspected, while six are still at risk for service. Is this risk negligible? Shouldn't CNSC request OPG to thoroughly inspect the remaining six areas and provide evidence that they are safe operations?

And from the same report, OPG also concluded that the local concrete degradation at the junction of Common 078 Intake Duct and Unit 7 Intake Duct are safe for operations until 2020, and that no further

inspections are planned.

As soon as that was discovered with water leakage and concrete degradation, it is possible that similar conditions may exist in the six partially and not inspected areas, as mentioned above.

The last complete inspection were -- of these six areas were in 2000, and if no further inspections are to be done until 2020, that leaves it another 20-year period for potential concrete degradation and water leakage.

CNSC should request OPG to conduct full inspection of those areas immediately.

So if there is no clear assessment showing that the vacuum building is safe, this license renewal must not proceed.

And I guess this sums up our submissions for today. Thank you.

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

Let's -- I'm sure there is lots of questions. Who wants to start?

Mr. Tolgyesi?

**MR. TOLGYESI:** On the intervenor's presentation, page 6 of 42, at 1.2, "*Ageing Equipment and Components*," second paragraph, they are saying that the Ontario Energy Board reports in 19 -- the 2012 report,

that Pickering A and B plants have among the worst and unsound measures, the worst operating measures, among nuclear generating stations worldwide.

Could you comment on that, OPG, and, after, staff?

**MR. JAGER:** Glenn Jager, for the record.

Pickering A and B plants, the Pickering Plant, actually has some of the best operating performance measures worldwide, particularly in the area of safety. I spoke to some of those in my opening presentation: personnel safety and emissions safety and nuclear safety.

What this was in reference was our production capability, the unit capability factor and forced loss rate.

It was referring to a period of time shortly following return to service where the units were going through performance improvement and, since then, we've dramatically improved the performance of the station to the point where, in the last quarter, our forced loss rate is at 2 percent, and we are achieving our production targets year over year.

So the performance of the station since that time has improved dramatically. This is owing to the strong investment that we have made, ageing management programs that we've completed, our strong human



performance program as well, and the significant investment that we've put in, in terms of continued operations and improvements to the power plant.

So the performance today is not what it was in the past, certainly, and we predict that, going forward right through to 2020, performance will continue to improve.

Our goal for capacity factor in 2015 is 80 percent, so we're expecting that performance will continue to improve and will certainly measure up to our expectations.

**MR. TOLGYESI:** This was in 2012, which is just last year.

That's the Ontario Energy Board doing annual reports, annual review, where I suppose all those improvements that you were implementing, it should be reflected in the 2013 Annual Report.

**MR. JAGER:** Glenn Jager, for the record.

The reports were made some time ago. We do do benchmarking studies to evaluate our performance against industry measures. It does not reflect current performance, for example, this year's performance or recent performance.

I could possibly ask Laurie Swami to comment on the Ontario Energy Board submissions, timetable

and content, and what goes into those reports.

**THE CHAIRMAN:** While they're coming to the table, I assume that the Ontario Energy Board hearings are about the rates, and they're not about nuclear safety issues.

So they may think that you are, I don't know, fat in operation, you have too many people, but I -- I could see them saying something about this, but I couldn't see them talking about your safety performance.

Could they?

**MR. JAGER:** Glenn Jager, for the record.

Certainly, when we examine staffing, the cost of operation of the facility, safety has to be a consideration in terms of ensuring the plant is operated safely and meeting all of our performance targets and having the necessary resources to do that.

So, yes, it is a consideration. Yes, you are correct, the OEB does look at rates. They set the rates and, as the only rate regulated electricity producer, that is their mandate.

So as part of those Ontario Energy Board submissions, we do do benchmarking and we do compare ourselves against other utilities in all those areas to provide the Ontario Energy Board with a full picture of our performance.

And if Laurie or Barb is there, they may want to add some details to that.

**MS. SWAMI:** Laurie Swami, for the record.

Just to directly answer your question, they do not do annual reports on our performance. It's done as part of the rate application process, and the information that is referred to is from our rate application a few years earlier and would be based on data from 2008 and 2009. So it's historical information, rather than current information that's being referred to here.

I think Mr. Jager referred to the benchmarking work that we do, and that will form part of our application going forward which we plan to do this year for the next rate application process the following two years.

**MEMBER TOLGYESI:** So you will have kind of plume behind you for things what happened in 2008, published in 2012, since you improved, implemented new improvements.

The next -- you said its next evaluation will come maybe in 2015 or so, so it's a kind of long process. You will have to live with this for years.

**MS. SWAMI:** Laurie Swami, for the record.

The rate application is determined when we are ready to apply. It's not something that is required

that they do on a regular basis, and OPG has determined that we will make a rate application this fall, and the hearings will take place likely next year.

And during that process, they'll review our past performance and they will also look to what are the investments we plan to make improvements to the operations.

They will then set a rate. It's really about the rate that we will receive for generation, as opposed to looking at the safety case for the plants.

**MEMBER TOLGYESI:** Staff, do you have any comments?

**DR. RZENTKOWSKI:** Yes, I would like to comment very briefly, because operating performance, it's one or our safety and control areas. We assess it every year and we report back to the Commission in the annual NPP Report.

In the 2012 report, for the first time, we will start trending past performance as well, because we generated enough information to start trending.

So, personally, what I notice is that the Pickering station was lagging behind the industry standards over the past few years, so that's -- that's an absolutely true observation. I refer to many operating events resulting from equipment reliability problems and

maintenance backlog. There were a few minor organizational performance issues, and, as a result, the safety performance, in some areas, was rated below the industry average.

This was reflected, as I mentioned, in the NPP Annual Report and it will be reported to the Commission in the summer of this year.

Nevertheless, as a result of concerted effort of CNSC and OPG staff, the overall safety performance of the Pickering station has been improved and, in general, is now meeting industry performance.

This demonstrates OPG's commitment to operate safely and reliably.

As the CNSC regulatory requirements and expectations continue to evolve, OPG will have to meet even higher performance standards in the future. That's why CNSC and OPG staff worked jointly to develop the sustainable operation plan for Pickering; to make sure that the safe and reliable operation will be maintained until the end of commercial operation.

**MEMBER TOLGYESI:** Thank you.

**MS. ELWELL:** Thank you very much.

First of all, just to clarify, that the rates the OEB sets are based on costs of service. So the costs of these mishaps in repairs has to be taken into

account in setting the rates.

The second point I would make, if things were so great at Pickering, why have worker exposure rates gone up, 17 percent last year, and even OPG admits under the ALARA Principle that exposure rates for workers may even need to go up. I refer to page 6 of 42 of our submissions.

So they can paint a rosy picture, but the facts prove otherwise.

**THE CHAIRMAN:** Okay. We'll allow OPG to reply and then staff.

**MR. JAGER:** Glenn Jager, for the record.

Worker exposure rates have not gone up. The worker exposure on an individual basis meets all our administrative goal limits. The total worker exposure we did expect to go up, because the amount of work was increasing, that is, in support of the fuel channel life management program and inspection programs to take the units to the end of life in 2020.

So the volume of work is going up, but that requires additional workers, additional effort.

Notwithstanding all that, we are continuing to reduce worker dose and aggressively going after an ALARA program which seeks to reduce dose for various work activities.

Thus far, the station is on target for its collective radiation exposure and no workers certainly don't exceed the administrative dose limits which are far below the regulatory dose limits.

**THE CHAIRMAN:** Okay. Some other -- other questions?

**MR. RZENTKOWSKI:** I would like to clarify also on average and maximum effective doses for 2012; they were very low. As a matter of fact, the average dose to the worker was only five percent of the regulatory limit and the maximum dose received was 20 percent of the regulatory limit in 2012. So they are very, very good results.

And also Mr. Jammal would like to comment on the operating performance of the station.

**MR. JAMMAL:** Ramzi Jammal, for the record and to clarify the record here.

I'm reading the executive summary from the Ontario Energy Board report itself. It concludes:

*"It should be noted that the ability of the plants to operate safely has not been called into question."*

So this is a discussion on power production and rate cost and the safety was at no time under question.

**THE CHAIRMAN:** Thank you.

Ms. Velshi?

**MEMBER VELSHI:** I know we spoke about radiation dose on Day One at some length. If you look at your projections to 2020, what do you see your collective dose being? Is it going up, down, given the increased inspection and maintenance work that may be required?

**MR. JAGER:** Glenn Jager, for the record.

We don't have a projection that goes right to 2020 at the moment. Our projections to 2015 are flat and current business planning we're seeking to reduce our collective radiation exposure over a business planning period.

So our current business planning period will go to 2015.

I would expect that as we get towards 2020, as the number of outages in our work program completes if you will, the overall collective radiation exposure would go down as a result.

**MEMBER VELSHI:** Thank you.

Next question is to staff. The intervenor talked about the recently published CNSC Epidemiological Study and probably dismissed it a bit. So I wondered if you could comment on that.

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



record.

The study was actually done starting in 2011 after the Darlington new build hearings because a lot of intervenors had highlighted the fact that there were no recent studies done around Canadian nuclear power plants.

And so after that, after those hearings, we worked with the Public Health Agency of Canada to see what type of data they had available and what type of study we could do.

We looked at facilities in Ontario. So we looked at the Bruce site, Darlington and Pickering. We also considered Port Hope and the Chalk River facility.

All of the data is from the Canadian Cancer Registry and the Ontario Cancer Registry. So it's not data -- cancer data that CNSC staff made up. It's actually valid and verified data.

There's been many studies done on the quality of cancer data in the Canadian Cancer Registry and the Ontario Cancer Registry.

And so the sources of data is from the Public Health Agency of Canada, Statistics Canada. It was validated by Cancer Care Ontario who have to give approval to release the data for studies like the one we did.

The CNSC study is unique in the sense that we're the only study done with actual exposure

information. All other studies that have been done internationally had no exposure information except for the French Geocap Study that was published last year.

The work that we did looked at -- the Port Hope work was published separately in a scientific peer-reviewed journal about three or four months ago using this similar type of methodology.

For Pickering, what we found was childhood leukaemia was lower than Ontario average; so no childhood leukaemia around Pickering that would be higher than Ontario, so lower than Ontario. Leukaemia for all ages, both sexes, again lower than the Ontario average.

And the intervenor talked about thyroid cancer. Thyroid cancer, there's been -- some intervenors have linked it as well to emissions of radioactive iodine.

We looked at radioactive iodine from the Pickering station and the other stations and, generally, the levels of radioactive iodine are not detectable. So we can't really link thyroid cancer with radioactive iodine from the Pickering station.

And so overall the results for Pickering show no childhood leukaemia, no leukaemia in all age groups, as well as -- and the other cancers are within the variation found in Ontario.

**THE CHAIRMAN:** You'll get the final word.

Anybody else? Mr. Harvey?

**MEMBER HARVEY:** On page seven of 42, the top paragraph, it's about the steam generators:

*"A major degradation mechanism with steam generators is corrosion in the piping -- goes by deposit pitting -- which has increased over the past three years, especially at Unit 1, a known pathway for air and waterborne release. CNSC imposed a derating penalty of three percent. And then the limiting factor for extending the design life of this boiler is not public safety but based on economic factors." (As read)*

So I would like the staff to comment on that paragraph.

**MR. RZENTKOWSKI:** Greg Rzentkowski, for the record.

Steam generators are periodically inspected by OPG staff and the inspection reports are reviewed by the CNSC staff. So if there are any suspect tubes, they are simply being plugged. So ageing of the steam generator is more an economical issue and not a safety issue.

But nevertheless, we have significantly more details and I would ask Mr. Gerry Frappier to describe the results of the inspections and where we stand on the safety of steam generators.

**MR. FRAPPIER:** Gerry Frappier, for the record. I'm the Director General of Assessment and Analysis.

So with respect to steam generation degradation, it's important to understand that this is a process that is known to be occurring. Its methodologies are known; it's a well-known issue.

Most importantly though it's very detectable. We have lots of ability for non-destructive examinations and testing. And there's also a strong standard with respect to when pressure tubes -- or sorry, when steam generator tubes are considered to be no longer acceptable and they will be taken out of service in the sense of plugging them. And, therefore, they are not a safety concern at that point.

For the details of the particular paragraph here, I would ask Dr. John Jin to provide some additional information.

**DR. JIN:** For the record, my name is John Jin. I am the Director of Operational Engineering Assessment Division.

My division is in charge of the assurance of structural integrity of the pressure boundary component and the containment.

When it comes to the integrity of the steam generator tube, what is important is that it's to make sure that there's sufficient safety margin in the steam generator tubes.

So to ensure that there is inspection going on according to the CSA standard, the licensee has developed features for service guidelines to assist the structural integrity of the steam generator tube.

As mentioned by the intervenors, the major degradation mechanism is on the deposit pitting corrosion. But the steam generator tubes in Pickering are in better shape than other steam generators.

The most problem at the steam generator is coming from the inconned tube, but for the Pickering steam generator it is made of inconned 400. So as far as industry licensee detected degradation, you know, in a reliable manner, if they discover any pressure tube not meeting the criteria, the licensee take it out from the service by plugging. So there is no safety concern with the Pickering steam generator tubes.

**THE CHAIRMAN:** But if I understand the intervenor's point here, it's that you didn't inspect all

of them or is that not what the issue is here?

And why won't you inspect them?

**MR. JIN:** For the record, Jon Jin.

Those steam generator tubes are required to be inspected according to CSA and 35.4. The 25 percent of the tubes should be inspected but the licensee OPG is inspecting more than that and that's the -- there's a -- the requirement for the inspection frequency.

So, during certain time operation, all the pressured -- all the steam generator tubes have been inspected.

**MR. JAGER:** OPG would like to comment.

**THE CHAIRMAN:** Go ahead, please.

**MR. JAGER:** Glenn Jager, for the record.

I'll ask Carl Daniel to describe our inspection programs for steam generators and the condition.

**MR. DANIEL:** Carl Daniel, for the record.

We have an in-service inspection plan for our steam generators. In general, the inspection of the steam generators is 50 percent of the tubes and 50 percent of the steam generators.

So there's 12 steam generators per unit. We inspect 50 percent of the tubes and 6 generators every two years. That was derived beyond what the CSA

requirement is and the reason for that is that it's -- it's as much an economic issue as it is a safety issue.

So the larger inspection program allows us to proactively look at the tubes. But we are inspecting 50 percent of 50 percent.

Pickering performance on inconned tubing, inconned 400 tubing, has been some of the best in the world. Pickering B had steam generators chemically cleaned a number of years ago and since then we haven't had pitting failures. Pickering A has not had a pitting failure.

**MR. JAGER:** Glenn Jager, for the record.

I'd just like to add that there is currently no de-rating penalty associated with the steam generators on the Pickering plant.

**THE CHAIRMAN:** You want to -- you want to reply to this?

**MS. ELWELL:** Yes, although I must say ---

**THE CHAIRMAN:** Use the mic, please.

**MS. ELWELL:** --- that I ---

**THE CHAIRMAN:** Use the mic, please.

**MS. ELWELL:** Except, I -- if I could have some direction?

Should I reply to the various topics that have come before or just this one?

**THE CHAIRMAN:** Well, go ahead.

**MS. ELWELL:** Okay.

**THE CHAIRMAN:** You can reply on whatever you want to reply to.

**MS. ELWELL:** Well, thank you.

Well, first of all, ---

**THE CHAIRMAN:** But we haven't finished with it, we've got lots of questions still.

**MS. ELWELL:** Oh good!

On the childhood leukaemia, I just wanted to emphasize that this study itself admits that the incidents of leukaemia around both Pickering and Darlington is "significantly higher than expected" and that the incidents of leukaemia around Darlington is again significantly higher ---

**MEMBER McDILL:** Mr. Chair, could we stop there and do this point-by-point?

**MS. ELWELL:** Yes, I think it's better.

**MEMBER McDILL:** It would be helpful. If I might?

**THE CHAIRMAN:** That's what we're doing: point-by-point.

**MEMBER McDILL:** Okay.

**MS. ELWELL:** Okay. It would be better for me too, Madam. Thank you.



But, I won't -- I just need to make this one last point.

It's as if the study wants to say that since 60 percent of common cancers in Ontario are lifestyle-related, the higher incidence of radio-sensitive cancers is also, therefore, lifestyle-related.

It's almost as if saying six-year olds are drinking and smoking in Northern Ontario and, you know, they're the cause of their own demise, which is absurd.

The most troubling aspect of the study is it says "no further investigations required". It concludes at Section 3.2:

"The higher cancer rates in a given region is not sufficient evidence to implicate specific risk factors or to require more investigations to assess the relative importance of various factors."

To say we don't even need to investigate anymore is certainly not an appropriate position for the National Regulator and certainly contrary to the precautionary principle which says -- there's competing science that precautionary -- cost-effective precautionary measures should be put in place.

So, you know, the study is difficult to

follow. The logic seems flawed.

With respect to ---

**THE CHAIRMAN:** Hold on. Hold on. Hold on.

Should we go one on one?

**MS. ELWELL:** Okay. Fine.

**THE CHAIRMAN:** Dr. Thompson?

**DR. THOMPSON:** If I could.

Patsy Thompson, for the record.

So, if I -- this is the study that was published on the CNSC Web site. So, on page 7, the first paragraph of Section 4.2 says:

"Figure B-1 in Appendix B shows that the incidence of childhood cancer among children aged zero to four living near the Pickering and Darlington NPPs was similar to what was expected in the Ontario population."

So no difference.

"Similarly, the incidents of childhood cancer -- so leukaemia, non-Hodgkin's lymphoma -- for ages zero to fourteen living near the three NPPs in Ontario -- so Bruce, Darlington and Pickering -- as indicated in Figure B-2 in

Appendix B, were also similar to Ontario."

So there's no increase of childhood leukaemia or childhood cancer around the three nuclear facilities and this is word-for-word what's in the report.

**MS. ELWELL:** Except the report acknowledges that the causes of childhood leukaemia remain poorly understood and that perhaps the main limitation when studying child leukaemia around nuclear facilities is our lack of knowledge in this regard.

That's at page 5.2.

**THE CHAIRMAN:** But, all research reports have admitted to do more research.

**MS. ELWELL:** No, actually.

**THE CHAIRMAN:** That's because ---

**MS. ELWELL:** With respect, they state: "Let's -- we don't need to investigate anymore."

**THE CHAIRMAN:** Okay. Your second -- your other topic, now?

**MS. ELWELL:** Steam generators.

Steam generators. The OPG admits that there's been observed fuel discharges at Unit 1 and that the deposit corrosion has increased in the past three years.

Rather than replace the steam generators

because it's too costly, they -- OPG would rather risk public health and hope that it gets the timing right on when to shut the generators down.

**THE CHAIRMAN:** OPG?

**MR. JAGER:** Glenn Jager, for the record.

As discussed, the steam generator performance is very good. I think the discussion here is confusing steam generators with the black deposits on the fuel discharge from Unit 1 for which we're operating at a 3 percent de-rate. That was discussed earlier today.

There is no effect on the fuel. The performance effect on the fuel is minimal. We analyzed that to be the case. We also understand the cause -- we believe we understand the cause of the fuel deposits and we've taken corrective measures on heat transport chemistry to arrest and reverse that and we are examining fuel discharge from Unit 1 up through July and we'll be reporting that to the CNSC staff.

Unit 1 was recently started from its planned unit outage.

**THE CHAIRMAN:** Okay.

Another line of -- somebody has some other questions?

Dr. McDill.

**MEMBER McDILL:** I have two questions,

please. Possibly three. Two, for sure.

Since you gave us the letter, I'll use the letter. With respect to point -- do staff have it? Okay.

So, in the letter, it refers to the 7,000 Becquerels per litre and the 14 in California's goal.

My question is: This may be Canada's standard, the 7,000 Becquerels per litre, but what exactly or approximately are the people of Ontario drinking?

Is it anywhere near these numbers?

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

And so, we've talked about the drinking water standards on many occasions for many hearings. We've said in the past that the CNSC does not set the drinking water standard but we do regulate releases from nuclear power plants.

And with the regulatory framework in place by the CNSC, the concentration of tritium measured in drinking water supply plants in Ontario, Quebec and New Brunswick are less than 18 Becquerels per litre.

So, during the licensing period, around Pickering, the range of tritium concentrations in municipal drinking water supply plants around Pickering vary between 7 and 18 Becquerels per litre. The annual average was between 4.4 and 5.8 Becquerels per litre.

So it's well below any standard that exists and below the recommended the level of 20 Becquerels per litre recommended by the Advisory Council.

**MEMBER McDILL:** Thank you.

Do you have a comment?

**MS. ELWELL:** Thank you.

Giving averages doesn't address the issue of accidental and unintended releases, and I'm sure many intervenors have given you a very long list of huge amounts of loadings, that have been unattended or maybe even operational, of tritium in drinking water. And you know, I could take you through it, Madam Commissioner, of all of these examples.

So just say, you know, averages doesn't speak to the high incidences of loading for particular plants at particular times which have been many, even as recent as March 2011. So that's the concern.

You know, the standard on the books we're told isn't the real standard and the averages are fine, and yet the news continues to report, you know, significant releases of tritiated water to Lake Ontario.

**THE CHAIRMAN:** Can I also add to this?

We have been talking about the 7,000 Becquerel per litre now for as long as I can remember, and the answer is always the same; the World

Health Organization, the ICRP, and the international community, and Health Canada deem it to be safe.

And until the international community or the medical community -- and somebody tell me if I'm wrong about this -- changes that, that is the standard.

Dr. Thompson, is there any movement to change this? And we get confused between the standard and the objective and the practice and all the other terminologies here. So maybe one more time give us a bit of clarity on this.

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

The World Health Organization has not changed the drinking water standard for tritium. For the WHO, the recommended value is 10,000 Becquerels per litre. Health Canada did, about two or three years ago, review the drinking water standards in Canada and has reinstated, essentially, the 7,000 Becquerels per litre value for tritium. It is recognized internationally; it's deemed to be safe.

But to answer the question from the intervenor, I gave averages but I also gave the highest measured value of tritium in drinking water around Pickering was 18 Becquerels per litre.

**THE CHAIRMAN:** Okay.

Dr. McDill, the second question?

**MEMBER McDILL:** Thank you.

Again, using the letter since it's in front of us and referring to .1. -- sorry, in Section 1.1.2.

If I could ask the intervenor, were you here earlier this morning on the discussion of 1992 versus 2012 CEAA?

**MS. ELWELL:** No, madam.

**MEMBER McDILL:** Okay, so I will ask -- and I assume there will be a few intervenors who are different, I'll ask Dr. Thompson to repeat that with respect to this point in the letter and the requirement for an EIS.

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

So the section of the letter refers to the need to do an environmental assessment, because the application came in a couple of days before the Canadian Environmental Assessment 2012 came into force, stating that if the *Canadian Environmental Assessment Act 1992* should have been considered.

And so our response this morning was under the *1992 Canadian Environmental Assessment Act* license renewals were not a trigger for the environmental assessment, and so an environmental assessment would not



have been required under the CEAA -- under CEAA 1992.

I did also mention this morning that there has been two environmental assessments done for the Pickering sites. There was one for Pickering A, return to service; there was one for Pickering B, refurbishment and continued operation; and there were several risk assessments done for ecological risks and human health risks done under the *Nuclear Safety and Control Act*, and we will continue to do that, as appropriate, to support our recommendations to the Commission.

But there is many, many, many assessments that have been done on the Pickering site. We have extensive monitoring information that shows that the activities being conducted on the Pickering site are not causing effects on the environment or human health that are not -- would be unacceptable.

**MS. ELWELL:** If I may respond.

We set out, at page 11 of 42, the past practice of the Commission with respect to Pickering renewal and applications.

The 2007 decision, with respect to refurbishment and continued operation of Pickering B, was the subject, and the Commission required an environmental assessment under the '92 Act, as well as the decommissioning of Units 2 and 3 of Pickering A; that's

the CNSC decision 2008.

Section 16 and 21 of the then *Canadian Environmental Assessment Act* did require assessment of these activities. And fundamentally, under your own constituting legislation, the *Canadian Nuclear Safety Act*, you, as the Commission, have a duty to ensure environmental assessment and impacts have been addressed and mitigated under your own constituting legislation, with -- you know, regardless of CEEA.

And more -- in addition, the Air Quality Agreement also sets out this requirement, as does the Great Lakes Water Quality Agreement.

And as the national regulator of nuclear industry in Canada, you're obliged to consider those Canada/U.S. agreements seriously. And I hope that Environment Canada will take this opportunity to address, in detail, the submissions we made on why those agreements are applicable.

**THE CHAIRMAN:** Okay, you opened the book here. So Environment Canada I think are with us here. Can we ask them to join us and maybe speak to that particular point?

**MS. ALI:** Hi, Nadia Ali, Environment Canada, for the record.

What I would like to do is just comment on

the two agreements, because you mentioned the Great Lakes Water Quality Agreement and the Canada/U.S. 1991 Air Quality Agreement.

So first, I'll speak to the Air Quality Agreement and the scope of Article 5, which is the article that deals with notification of this agreement, which was adopted in 1991.

The trigger for notification to the United States provided for under paragraph 2 is whether a proposed action, activity or project is subject to assessment under paragraph 1.

Paragraph 1 in turn provides for an obligation to assess only such actions, activities and projects, that if carried out, would be likely to cause significant trans-boundary air pollution.

There is no obligation under the agreement to assess actions, activities and projects that are not likely to cause trans-boundary air pollution.

So the threshold in the agreement remains a likelihood of significant trans-boundary air pollution.

And the information that Environment Canada, you know, is aware of on the relicensing of Pickering, does not indicate that there is any likelihood of significant trans-boundary air pollution resulting from the relicensing of the plant.

So hence the treaty obligations, assessed and notified, does not appear to exist here.

With regard to the -- and it's not -- also, it's not a new plant, it's an existing plant.

The other thing is the Great Lakes Water Quality Agreement, which was signed last year, and a lot of the processes, procedures for this are still being worked out between Canada and the U.S.

So Article 6 of this new agreement is a new feature of the amended Great Lakes Water Quality Agreement, and it's -- it introduces a notification requirement.

It talks about planned activities worthy of notification must be significant and the notification must be timely.

However, the agreement does not specify does not specify thresholds that a magnitude of planned activities requiring notification, nor does it mandate timeframes of such notifications so as not to limit the particular activity from this notification.

And Canada and U.S. are in the process of developing an approach for undertaking this notification.

Some of the information we have today is that the notification is intended to provide information about the activity and, if applicable, any opportunities

for the public to participate in activities that are happening outside of the Great Lakes Water Quality Agreement.

For instance, if a planned activity is undergoing a federal environmental assessment by another agency or if there's an environmental protection assessment, like is done by the CNSC, the notification would provide opportunities or provide advice where the public can input and participate as people are doing in this particular hearing.

And that's -- so because the agreement is new for the Great Lakes Water Quality Agreement, the procedures and the criteria are still being worked on.

**THE CHAIRMAN:** Can I -- just a clarification; when both of you are talking about a notification, notification of whom? Who do you notify?

**MS. ALI:** Well, if Canada has a project that they think is going to result in trans-boundary effects, they would advise the U.S. government. And in the case of the Air Quality Agreement, there's a specific form that is filled out by the Proponent and submitted to -- there's a place -- there's a particular office in Ottawa that it is submitted to and through that office, it would get to the United States.

**THE CHAIRMAN:** But does it go to a

particular department or a particular agency in the States?

**MS. ALI:** It would go to a particular agency through Environment Canada. The same thing with the Great Lakes Water Quality Agreement, there's a committee that's being set up called the Great Lakes Executive Committee. So the notification would go to them and it's a bi-national committee, so that is how the notification would get to the U.S.

**THE CHAIRMAN:** The last I heard, the Americans are not shy to come to us if they think we're non-compliant ---

**MS. ALI:** Right.

**THE CHAIRMAN:** --- with any understanding. They will be in here -- they're coming to our government directly.

So I don't understand this non-compliance and who actually takes action on this. If the International Joint Commission had difficulties with the Pickering operation, they would be coming directly to us. They don't need anybody, including us, to give them advice.

**MS. ELWELL:** Nice point, Mr. President.

What I would say is there is a very healthy practice of notification back and forth. There were 64

U.S. notifications to Canada since 1991 and 58 Canadian notifications.

So it's not unusual or unreasonable for an activity that may have significant trans-boundary impacts to have notice of it and to have those impacts assessed and avoided or mitigated where possible.

My response to my friend, first of all, with respect to the Air Quality Agreement, Article 5, the trigger, the logic of this should be apparent.

How can you know there's no trans-boundary impacts unless you've done an assessment that concludes that? How could the IJC know that Pickering is the oldest and most troubled nuclear plant, if notice hasn't been given that its extension is being sought, hence, our request for a registry so that we can follow these things?

Finally, my friend says that the Great Lakes Water Quality Agreement says if there's domestic opportunities to engage in and environmental assessment, that may satisfy the notice requirement. Yet, my colleague over here affirms that the CAA doesn't permit environmental assessment of this application.

So no assessment has been done, so you can't say there aren't impacts. And two, we don't have an opportunity in this proceeding to have a comprehensive and independent environmental impact assessment and,

therefore, the Great Lakes Water Quality applies.

**THE CHAIRMAN:** Environment Canada, do you want to reply to that?

**MS. ALI:** Well, I was actually going to pass the buck to Patsy Thompson because even though there isn't an environmental assessment happening under the *Canadian Environmental Assessment Act*, this whole process -- I mean I think Patsy said earlier that all the monitorings been reviewed, there's a lot of review that's been undergone by different agencies and we are in this hearing, where people are intervening and expressing their concerns.

**THE CHAIRMAN:** Dr. Thompson, do you want to add anything to this?

**DR. THOMPSON:** Patsy Thompson.

Essentially, I'll repeat what I said earlier, which probably wasn't clear.

Under the *Nuclear Safety and Control Act*, we have an obligation to make sure that the environment is protected, and the way of doing that is to do ongoing assessments. And so there's a regulatory requirement on the licensees to monitor all of their emissions. There are requirements for environmental monitoring programs.

We have done detailed assessments of impacts on fish, have requested fish mitigation. We have



looked at air emissions; we've modelled them, we know what doses are, we know what chemicals are being released, where those chemicals are going.

So there's been extensive assessments done over many, many, many years. And it's that information that CNSC staff use to make recommendations to the Commission to say that OPG will be taking adequate measures to protect the environment.

**THE CHAIRMAN:** Okay. Very quick.

**MS. ELWELL:** Very quick, thank you.

We have not had an environmental impact assessment of the Pickering application. At most, we've had a screening.

And if Darlington is any example of what an environmental impact assessment looks like, the regional scope of the assessment was only 1 kilometre within Lake Ontario. So it's not assessing trans-boundary impacts.

**THE CHAIRMAN:** Dr. McDill?

**MEMBER McDILL:** Thank you, that's fine.

**THE CHAIRMAN:** Anybody else?

Mr. Tolgyesi?

**MEMBER TOLGYESI:** Yes, on page 7 and, as the intervenor was talking about, "Structural Safety and Unforeseen Concrete Degradations", and they are specifying that only two of eight areas were fully inspected for the

underwater concrete integrity.

And there is -- concrete degradation has already been discovered at Unit 7. Could OPG comment and when you expect this inspection could be completed?

**MR. JAGER:** Glenn Jager, for the record.

Before I ask Carl Daniel to comment on the inspections and evaluation that was done, I just would like to correct the location.

This concrete falling was observed on the water intake duct. It has no connection to negative pressure containment or the vacuum building per se.

The vacuum building outage affords the opportunity to inspect the intake duct because all the units are shut down and consequently there is no water flow through the intake duct. So we're able to send in divers and perform those inspections.

So it has no -- that falling has no connection to the containment per se.

Nevertheless, we did do an inspection and an evaluation, and I'll ask Carl Daniel to speak in more detail there.

**MR. DANIEL:** Carl Daniel, for the record.

As Mr. Jager said, OPG has a periodic inspection program that's based on the Canadian Standards Association for the inspection of concrete -- containment

concrete structures. Those reports -- inspection reports and plans are accepted by the -- by the CNSC as part of our licence to operate.

In 2010, during the vacuum building outage the containment structures inspections were performed and the activities involved concrete components, vacuum -- vacuum building joint sealant, vacuum building roof seal and pressure relief duct joint seals.

As a result of those inspections, no issues were observed and any minor findings from the inspections were actioned for correction as part of that program. That's the containment inspection.

At the same time, the -- so during that vacuum building outage in 2000, the intake structures on the -- the intake concrete structure of Unit 7 intake duct was also inspected.

As part of that intake channel, just to make it clear, that is not part of the containment structure. A condition assessment was completed subsequent in the 2010 VBO conforming the structural integrity of the intake concrete structure was intact.

The -- sorry. The assessment report was completed, concluding the structural integrity of the intake structure was intact.

CNSC did have comments on that report.

Discussions were held and the report consequently was revised addressing satisfactory all of the CNSC comments.

CNSC has accepted the conclusion of that assessment and the report confirming that the structural integrity of the CCW intake structure is acceptable for operation up to 2020.

**MEMBER TOLGYESI:** Staff, do you have any comments?

**DR. RZENTKOWSKI:** Yes. Greg Rzentkowski, for the record.

So obviously, there are some misinterpretations with regard to the details of the CANDU design and results of the inspection.

So in addition to what OPG has already stated, that there are periodic inspection program looking at all concrete structure, I would like to mention that all the results of the inspections are being reviewed by the CNSC staff.

In addition, we have onsite staff present who often participate in the licensees' inspections.

And regarding the vacuum building outage, it is very important to mention that this is not a very frequent outage, it happens maybe every 10 years because it requires all units to be shut down.

And in this particular case, the vacuum

building performance was in accordance with the regulatory requirements; the leak rate was very low, about 50 percent of that what is set as the regulatory limit.

I will ask Mr. Gerry Frappier to describe more details of the results of the inspections.

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

Gerry Frappier. I think, first of all, I would like to reconfirm that the concrete and ensuring the integrity of the concrete structures is a key part of our fitness for service.

We have a strong Canadian standard on that and there is periodic inspection and testing requirements from that standard. There is various non-destructive examination methods that are used, and periodic leak testing as was just described with respect to containment.

I think also, I want to put on the record that the intervenor is talking about Alkali-silica degradation mechanism. There is none of that happening at Pickering right now. This is a phenomena that we are always on the look-out for. It is something that is detectable quite readily, and could come to be an issue down the road, in many decades; who knows?

But it is not an issue right now. There is not that degradation mechanism -- there is no evidence of that degradation mechanism in place at this time.

With respect to the details of the results of the inspections that were just done, I would ask Dr. John Jin to provide additional information.

**MR. JIN:** Jon Jin for the record. I am the Director of the Operational Engineering Assessment Division.

The licence is correct that the water intake duct is not part of the containment system. And there was spurling going on in the Unit 7 of the water intake duct which is considered very minor degradation.

And the intervenor was correct, it was originally supposed to be inspected in 8 places, but the licence inspected first scope inspection for 2 areas, partial inspection for the other 2 places.

For the remaining 4 places, those areas were inspected in previous outages which was in 2000. So in the licensee applied the engineering assessment methodology, based on the inspection result from 2000, to predict the condition at the end of the commercial operation which is 2020.

And the CNSC staff reviewed and they found that the methodology quite conservative and finally concluded that the water intake duct working for service according to the modern standard which is CSAN-N291.

**THE CHAIRMAN:** You?

**MR. CHENG:** Yes, I'd like to make a response.

I would just like to ask, or raise a question, is that: As the staff mentioned there were areas that were not inspected and that they were predicted to be in safe operation, but that gives it a whole 20 years of potential concrete degradation.

It was discovered in Unit 7 intake duct that there was -- that they admitted -- there was local concrete degradation. And so, in these six -- in these 4 other areas that they were not inspected -- shouldn't they be at least monitored every, like, 5 or 10 years instead of just leaving them be until 2020?

**THE CHAIRMAN:** Staff?

**DR. RZENTKOWSKI:** I refer to the vacuum building outage which typically takes place every 10 years. This is in accordance with the standards. So the main objective of this outage is, of course, to assess the leak tightness of the containment, or vacuum building in this particular case.

It is not to inspect other elements or other structures. They are covered by a very elaborated ageing management program. I don't have any details right now, but we can talk about every specific component which has its place in the ageing management program.

I will ask Mr. Gerry Frappier to provide more details.

**MR. JIN:** Jon Jin for the record. When it comes to the inspection of water intake duct, we apply the practice of the risk-informed approach.

With allocated resources, I will direct our licensees to pay more attention on the more higher safety significant area so like vacuum building wall containment structure could be more inspected.

But when it comes to the water intake duct, staff considered it is quite not highly safety significant. So we don't see the reason to ask the licensee to inspect before the next -- before the end of the commercial operation.

**THE CHAIRMAN:** How difficult is it to do this inspection?

I am not sure I understand how onerous it is to do this, even if it is not high risk safety wise. You are saying that two areas you have enough confidence that you do not need to do more.

Is that what you are saying?

OPG?

**MR. JAGER:** Glenn Jager for the record.

The location on the water intake is a location where -- it is a common water intake -- so while



the units are in operation, there is a large volume of water that is drawn through that area.

And that is why it is inspected during a vacuum building outage, when all the units are shut down and all the condenser cooling water pumps are shut down, the water is -- the water conditions are stagnant and that makes it safe for divers to enter that duct and perform the inspection.

So it comes down to personnel safety and the ability to safely access that location.

As well, the -- as was mentioned by the CNSC staff -- the effects of spalling in that location is a very low consequence, and well-managed through our ageing management program.

**THE CHAIRMAN:** Thank you.

Anybody else, any particular question?

Okay, you have the file summary.

**MR. CHENG:** I have one response.

Well, we actually requested a report from CNSC Lavallin disclosure, but we never received it, so we would have been more helpful in that respect, and...

**THE CHAIRMAN:** Let me stop you here, because it was one of my questions.

Why were those reports not available?

Those are the 2 reports that describe on page 23.

Are they proprietary reports also, I mean, that's ---

**DR. RZENTOWSKI:** Yes, both of those reports are not the CNSC reports.

In this particular case, of the eight process, it requires to go to the source of those documents and obtain a permission to release.

Miguel, do you recall the details of this request?

**MR. JAGER:** Glenn Jager for the record.

Those reports were produced by a third party and permission was not granted by the third party to provide access to those reports.

That was the reason that I have noted down here.

**THE CHAIRMAN:** Sorry, are they consultant-type reports?

**MR. JAGER:** Yes they are.

They are prepared by a third party for OPG, and are proprietary reports. We require their permission in order to release the report.

**THE CHAIRMAN:** That falls in the same categories that we have to decide -- when these are referenced to a particular report, we have to decide what is disclosable and what is not, in a little bit more

rigorous way.

I do not know if -- I don't know why the third party refused to do this, but I guess staff will take a look again.

**MR. SANTINI:** We will look into it.

Miguel Santini for the record.

**MR. BENNY:** I would like to make one more comment.

**MR. CHAIRMAN:** Go ahead.

**MR. BENNY:** So I would still like to address the CNSC staff about the vacuum building outage inspections in 2010.

Just one -- we still want to know why there were 6 partially and non-inspected areas?

**DR. RZENKOWSKI:** Greg Rzenkowski for the record. I would like to go back to the previous problem before I answer this particular question.

In the case of those 2 reports, I understand that the results of the studies were disclosed.

Only the reports were not disclosed because of the methodologies, which are indeed described there, and for that we needed permission. Results are published, yes.

Now, regarding those areas which were not inspected, I'm not sure if I fully understand the question

because the entire vacuum building, in my opinion, was inspected. Those areas not inspected probably go back to the intake -- intake duct, but I will ask Mr. Gerry Frappier to confirm.

**MR. JIN:** John Jin, for the record.

Again, the water intake duct is not part of the vacuum building and during the vacuum building outage, the licensee has limited time. So the original -- even though the original plan is to inspect eight places of intake -- of water intake duct, a licensee may have to more focus on the vacuum building inspections.

So there was justification and CNSC staff operated with the justification.

**THE CHAIRMAN:** Okay. You now totally confuse me. So what I want to know is the vacuum -- forget about the intake -- the vacuum building itself, eight areas were planned to be inspected and only two were done.

Did I get the question right?

**MR. JAGER:** Yes.

**THE CHAIRMAN:** Okay. Somebody answer it, please.

**MR. JAGER:** Glenn Jager, for the record.

I'll ask Carl Daniel to speak to the inspection program for the vacuum building and he will

confirm it, but I believe that all the necessary areas -- all the areas associated with the vacuum building outage were completed as planned.

So I'll ask Carl to provide more details.

**MR. DANIEL:** Carl Daniel, for the record.

Yes, all the vacuum building structure inspections were complete. As I said earlier, it involved the concrete components themselves, all of the building joint sealant, the vacuum building roof seal, as well as the pressure duct joint seals. All of those were inspected as part of the vacuum building outage. There were no areas missed.

The areas that are being discussed were part of the intake structure. An assessment was done on the areas that were done. An engineering assessment was done after that. It has been submitted. The intake structure is not part of containment but it was deemed to be acceptable to 2020.

**THE CHAIRMAN:** Okay.

Over to you, last word.

**MS. ELWELL:** Last word and I'll keep it quick. Thank you.

I just leave with asking two questions.

If OPG cannot mitigate or avoid expected safety and environmental impacts from extended operations

and decommissioning, how can the Commission lawfully approve the application?

And secondly, even if the Commission can say it expects OPG to comply with minimum radiation protection regulations, can it really be sure that those limits are protective?

So our suggestion is to hold a public consultation on your new Canadian Childhood Leukaemia Study so that you can have a peer review of the evidence because we say we've got science that says different than their science. And I think that it would be protective and prudent to have a good discussion about that with leading experts in the area.

And I thank you for hearing us today.

**THE CHAIRMAN:** Thank you.

We will now break for dinner. Seven thirty?

Seven thirty. Okay, we will resume at 7:30. We will continue the oral hearing.

--- Upon recessing at 6:40 p.m. /

L'audience est suspendue à 18h40

--- Upon resuming at 7:30 p.m. /

L'audience est reprise à 19h30

**THE CHAIRMAN:** Okay. We are ready to proceed and we will move to the next submission which is an oral presentation, as outlined in CMD 13-H2.12. I understand that Ms. Stevenson will make the presentation. Please proceed.

**13-H2.12**

**Oral presentation by  
Brenda Stevenson**

**MS. STEVENSON:** Thank you for the opportunity to speak today at the Pickering hearings.

A decision to continue operating the Pickering nuclear station will put four million people in the Greater Toronto Area at risk.

I will be brief as there is good representation from competent voices of reason: Arnie Gundersen speaking for Durham Nuclear Awareness, Northwatch, Sierra Club, Greenpeace, Canadian Environmental Law Association, concerned doctors, and so many more groups and individuals.

I am a mother, grandmother, a volunteer, and a natural health advocate, residing approximately 40 kilometres from the Pickering Nuclear Power Plant, with grandchildren living within the 20-kilometre zone.

There are many reasons why I urge that the OPG's request for a five-year licence be denied. I will touch on just a few.

We have had three major nuclear accidents on the planet since the 1950s, the late 1950s: Three Mile Island, Chernobyl and Fukushima. Chances of a next big disaster are not unreasonable.

The Fukushima Daiichi catastrophe occurred at a plant that was 40 years old and had just received their extension.

The Pickering nuclear plant is Canada's oldest and most dangerous nuclear station. Extending the old Pickering B reactors beyond their designed life is definitely not an acceptable risk.

If Hydro Quebec decided it was not safe anymore to continue running the reactors at the Gentilly nuclear station beyond their 210-hour shelf life, then why would OPG want to extend Pickering's reactors past their due date, putting Ontarians at risk?

As they stand, Pickering reactors would not pass current design standards. Currently, six reactors share only one safety unit. Furthermore, Pickering Nuclear Power Plant was built pre-911 and without fortification against severe and changeable weather that we are now experiencing.



As far as planning for the worst goes, a workable evacuation plan for a large-scale disaster does not exist. How to move millions of people when things go wrong? A tall order, but the very act of running a nuclear plant in a densely populated area demands this.

Theresa McClenaghan addresses this -- from CELA, addresses the evacuation more thoroughly than any of the industry insiders.

Confusion surrounding potassium iodide pills availability is but another example of the lack of foresight. I pray to God that we do not need to ever evacuate due to a catastrophic nuclear accident, but in light of the loss of lives due to the Fukushima accident and with what the Japanese who survived -- those who survived are now facing my confidence in the nuclear industry is low.

Cost-wise, the one billion that the Canadian government infuses into nuclear power plants is one billion that cannot go to social and health programs or renewable green energy.

Repairs to the Pickering power plant began in 2000 and were estimated to be 1.3 billion. They were actually 2.6 billion for only partial repairs.

Operating and maintenance costs will go up should Pickering be renewed. Consider that we now have an

energy surplus and energy demands are declining.

While on the subject of dollars, nuclear accident cleanup is hugely prohibitive. Estimates for Chernobyl are in excess of 16 billion; Three Mile Island, 4.8 billion; and 250 billion for Fukushima.

One can only imagine the cost to families in loss of life, homes, livelihood and community infrastructures.

But for me, the most urgent reason for not renewing Pickering's licence are the ongoing health impacts on the millions of people residing in the Great Lakes Basin, drinking their water from Lake Ontario.

There are 38 operating nuclear power plants, American and Canadian, around the Great Lakes, of which 12 are closed, but they have their own radioactive waste.

Cancer-emitting hazardous waste and radioactive spills and releases are a very real concern for the surrounding population, especially the vulnerable in our society: pregnant women, children, the elderly, and the immune-compromised and chronically ill, never mind our pets.

Tritium releases deemed safe by industry standards in fact damage DNA, cause cancer and can lead to immune and endocrine disorders. Low-dose radiation, which

is a lot more insidious than it sounds, causes mutation that over time and through generations impact our health in negative ways.

Theories of threshold levels assume that there was a standard dose of radiation below which there is no cellular damage. This is a dangerous assumption. It does not take into consideration individual body burdens and lowered immunity from other carcinogenic sources.

Tritium's beta emitting radionuclides from heavy water or vapour are extremely pervasive. They find their way into the air we breathe, the food we eat, and the water we absorb. We even absorb tritium through our skin.

Tritium intakes in people in the 5 to 10 kilometre range from the Pickering nuclear plant are 30 to 40 times greater than background intakes. Background or naturally occurring tritium, comes from cosmic rays, plants, soil, and rocks.

Nuclear weapons testing and weapons manufacturing have become part of background radiation. There seems to be no end to the damage the nuclear industry creates.

By European and California standards, Canadian acceptable tritium level standards are hazardous.

Why does the CNSC allow for greater discharges of tritium in Canada?

Excess cancers predicted from radiation exposure are calculated by looking at an individual's 1-year exposure through drinking water, as opposed to years of drinking water exposure. They look at the short term, not the chronic exposure.

Lowering the acceptable 7,000 Becquerel per litre levels in drinking water to lower, safer levels, ideally 20 Becquerels per litre, would only be doable if reactors are shut down.

Furthermore, there is an assumption within the industry that tritium is a weak, radionuclide, because, once it decays, the particulate energy is low. Paradoxically, in radiation biology, the weaker the particle the more effective it becomes.

Finally, CNSC has recently released radiation study, using data from 2001 to 2008, concludes that excess cancers in Ontario, which are increase in cancer of upwards expected, is unlikely due to radiation.

Words such as "unlikely" are not convincing or scientific, to me. This is, frankly, an outdated and incomplete study that is meaningless without any results from the last five years.

In order to manage harm, the Pickering

plant needs to be closed and then decommissioned to secure the 25,000 plus tonnes of radioactive waste. Public involvement needs to be part of the process.

I come from a long line of daughters, mothers, grandmothers, caregivers for the young, the old, and sometimes the dying. There are no safe nuclear plants. There is no acceptable level of exposure to ionizing radiation.

I leave you with a quote from Daisaku Ikeda, President of a Buddhist association for peace and nuclear abolition:

"Raising one's voice or taking action is something we all can do. All that is required are the natural feelings shared by people everywhere, the desire to live in peace, the wish to protect those we love, the determination to spare the world's children needless suffering."

Thank you.

**THE CHAIRMAN:** Thank you.

Dr. McDill?

**MEMBER MCDILL:** Thank you for your contribution and for coming today.

You have said, if I understood you

correctly, that you believe people in Ontario were drinking water that's got 7,000 Becquerels per litre? Is that -- did I understand -- what ---

**MS. STEVENSON:** No.

**MEMBER McDILL:** Okay.

**MS. STEVENSON:** That was my -- no, sorry.

Yes. No, I know that's the accepted level.

**MEMBER McDILL:** Right.

**MS. STEVENSON:** Yes. No, but they're still taking in ---

**MEMBER McDILL:** So what ---

**MS. STEVENSON:** --- tritium in their water.

**MEMBER McDILL:** Were you here just before dinner?

**MS. STEVENSON:** No, I wasn't.

**MEMBER McDILL:** Okay.

**MS. STEVENSSON:** No.

**MEMBER McDILL:** So this is a challenge sometimes when we have hearings, because we have to repeat things several times ---

**MS. STEVENSON:** Sure.

**MEMBER McDILL:** --- or ask the same question of staff several times.

So I will ask staff again the question, what are the levels that are being consumed in Ontario,

given all of the nuclear plants around the lake?

And then, just to go one step further, what exactly does 7,000 Becquerels per litre mean in terms of exposures?

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

There are routine measurements of tritium at all drinking water supply plants around nuclear power plants in Ontario and other provinces.

And so around the Pickering plant, over the licensing period, so the last five years, the range of tritium concentrations was between 7 and 18 Becquerels per litre. And if you look at the yearly average, it's between 4.4 and 5.8, depending on the drinking water supply plant.

In terms of the guideline of 7,000 Becquerels per litre, it's based on the World Health Organization guideline of 10,000 Becquerels per litre, and that is based on someone consuming two litres of water every day, 365 days a year, and it equals to a dose of 0.1 millisieverts. So one-tenth of the public dose limit for drinking two litres a day, 365 days a year.

And just to put the 0.1 millisievert in context, if you look at natural background radiation in Ontario, around the Pickering and Darlington area, natural

background radiation is about 1.38 millisieverts per year, and around the Bruce site it's around 2.2, so the difference of about .6.

And so just living in different places in Ontario will give you a better -- a greater difference in radiation exposure than the 7,000 Becquerels per litre, which is .1 millisievert.

And so you get less exposure from 7,000 Becquerels per litre a day, than you would from moving and living different places in Ontario.

**MEMBER MCDILL:** If I could ask the intervenor, were you aware of the intake values in the water intake around Pickering?

**MS. STEVENSON:** Somewhat aware, but I guess my question back would be, you're looking at one year. What about ---

**MEMBER MCDILL:** Staff?

**DR. THOMPSON:** I guess waving -- waving doesn't work, right?

**MS. STEVENSON:** No, okay.

**DR. THOMPSON:** Sorry.

**MS. STEVENSON:** What about accumulation over years?

**MEMBER MCDILL:** Well, we'll direct it back to staff.



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

So those measurements I gave is for the five-year licensing period. There are similar measurements for many, many years, and the values are in the same range.

In terms of accumulation over a lifetime, what we do when we look at doses to members of the public, and so around Pickering the doses to members of the public over the last five years have varied between 0.9 microsieverts per year and 4.1 microsieverts per year.

Because tritium is an internal emitter, so it's an internal radiation exposure, we look at the intake of tritium in a given year, but assume that there will be some tritium in the human body over a long period of time, and so that accumulation over time is considered when we do the calculation of the radiation dose.

**MS. STEVENSON:** I guess my point is that, you know, we're looking at all sorts of different carcinogens, so you add tritium into the mix of someone who, you know, is unwell, it could just push them over the limit in terms of chronic illness.

**MEMBER MCDILL:** Do you want to try that?

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

I would -- I don't know if Dr. Goel, the Public Officer of Health for Durham, is still here. I know they were supposed to be here today.

But what I would say is that there are many health studies that have been done in the area, including by Durham Public Health officials, and those studies indicate that the health of the population around Durham is similar to what is seen in other regions of Ontario.

**DR. DEMETER:** Dr. Sandor Demeter, for the record. I'm a nuclear medicine physician and also a Public Health physician.

So I think the incremental risk of exposure needs to be put into context. And I do acknowledge that cancer is the leading cause of death for Canadians, so about -- there's 100 people in this room, 40 of them will get cancer at some time in their lifetime. So there's a lot of energy and work and research going into the causes for cancer. Not all cancers are the same, so it gets a bit more complicated.

But we have to put that radiation into some perspective. So if we take the most conservative models of -- because we don't know the cancer risk at such low rates. If we take the most conservative models from the biologic effect of ionizing radiation 7, which is 10 percent per sievert -- we're talking microsieverts, which

is one-millionth of that.

If we go from one in 10 lifetime risk, to one in 10 million per microsievert, so we're talking .9 to 4.2 microsieverts, so we're talking between 1 and 4.2 expected cases over observed in a lifetime per 10 million people. That is the incremental risk based on the best science right now.

So I couldn't even do a study -- I would have to find 100 times ten million to try to see if I could actually see that difference and prove it statistically.

So I agree that -- with the intervenor that, you know, we have to be very cognizant of the multiple causes that impact on cancer, including genetics, lifestyle, other toxins, chemical and otherwise, but the incremental -- from a commonsense perspective, the incremental impact of this dose in micro sieverts, it would be hard to figure out even how to look for that impact given the best science that we have.

**THE CHAIRMAN:** Can I jump on this?

So maybe you can explain, maybe once and for all, the role of background radiation; okay?

We live with background radiation. That background radiation varies from, you know, Canada thinks the average is around two, something like that, but there

are countries, there are places that are -- it's maybe 100 times higher.

Unless those countries demonstrate a higher incidence of cancer why can't we use the population in general with background radiation as proxy to whether there is a direct cause/effect relationship between low background radiation and cancer?

**DR. DEMETER:** Sandor Demeter again for the record.

There is considerable variation in background radiation, even within Canada, based largely on radon concentrations, and internationally; so there's some really high radon areas in India and parts of the Middle East.

And there are some variations in cancer rates amongst these countries, but the variation in cancer rates do not correlate that well with the variations in background radiation.

So the -- what you would expect to see given the span of difference in background, you don't see that difference in the span and difference of cancer rates. And sometimes, you don't see any difference in cancer rates and, sometimes, you see some differences in cancer rates but the magnitude of the differences are not accounted for by the differences in background alone.

And some of the confounders are other causes of mortality that compete with cancer. People maybe not live long enough in some countries because they die prematurely from accidents or other causes of death that compete; other ones, their smoking rate's different. So there are some things that should be controlled for but are difficult on an international basis.

So there is some evidence that rising radiation doses that -- beyond a certain level do have a link with rising cancer rates at that same higher level but that's not the whole story and we don't understand why that correlation isn't that perfect.

Obviously, there's a number of other things that lead to induction of cancer, given how common it is as a cause of death in Canadians and internationally.

**THE CHAIRMAN:** Thank you.

Dr. McDill.

**MEMBER MCDILL:** Thank you.

One more question with respect to the intervenor.

In your written submission, you say that Hydro Quebec is developing an accelerated decommissioning plan, and I just wanted to go to staff and have a comment on that.

**MR. JAMMAL:** Ramzi Jammal, for the record.

The decommissioning plan for Hydro Quebec is still being developed, and one of the proposed acceleration of the decommissioning plan is underway.

Hydro Quebec has engaged an expert -- a third-party expert in order to develop their plan on an accelerated ten-year period and that's what they are evaluating.

And the accelerated decommissioning plan will have to take several factors into consideration, from radiation protection, waste management, and the activity that's being carried out, which will require a completely different handling than a long-term lay up of storage or in a safe-storage type of delayed -- or delayed decommissioning.

**MEMBER MCDILL:** But at this point in time, there is no formal plan in place?

**MR. JAMMAL:** Ramzi Jammal, for the record.

At this time is -- nothing has been submitted to the CNSC. We are in discussion with Hydro Quebec. We told them of our regulatory expectations. They are developing the plan and they are expected to submit it within a few months.

**MEMBER MCDILL:** Thank you, Mr. Chair.

**THE CHAIRMAN:** Okay.

Anybody else?

Dr. Barriault?

**MEMBER BARRIAULT:** Just briefly on the potassium iodide pills.

This morning, it was discussed and it's available at the local pharmacies, apparently, free of charge.

I don't know if you are aware of that?

**MS. STEVENSON:** Yes, actually I am, but I think a lot of residents in the area don't know that.

**MEMBER BARRIAULT:** Okay, thank you.

Thank you, Mr. Chairman.

**THE CHAIRMAN:** Anybody else?

I think -- I don't know if you also heard that one.

Can we clarify the death because of Fukushima?

Thus, you said, you know, people died because of the Fukushima. Are you talking about the nuclear issue in Fukushima?

Because my understanding is that nobody died from radiation in -- because of the nuclear incident. Can somebody clarify us on that?

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

That's correct, there have been no deaths

from radiation exposure due to the Fukushima accident.

**THE CHAIRMAN:** Most of the deaths were because of the tsunami and the earthquake.

Okay, you have the final word.

**MS. STEVENSON:** Thank you.

Yeah, I think that's it for me. Thank you for hearing me.

**THE CHAIRMAN:** Thank you.

I'd like to move now to the next submission, as described in outline -- as outlined in CMD 13-H2.136, and I understand that Ms. Jakubiec -- I don't know if I got the name right.

**MS. JAKUBIEC:** Jakubiec, close.

**THE CHAIRMAN:** Jakubiec, right. My eyes here.

**MS. JAKUBIEC:** Sure.

**THE CHAIRMAN:** Will make the presentation. Please proceed.

**13-H2.136**

**Oral Presentation by**

**Ms. Alexis Jakubiec**

**MS. JAKUBIEC:** Thanks.

I apologize if I start choking. I'm



fighting a cold so I'll just try and get through this.

Please reconsider running the Pickering Nuclear Power Plant beyond its designated lifespan. I strongly urge the OPG's request for a five-year licence renewal be denied.

Please consider alternate -- alternative energy options. Renewable energy is a way of the future. I understand job loss at OPG is a concern, but there will be so many jobs for these workers in renewable energy.

I have always been wary of nuclear energy. As a child of the late '80s and '90s, my first memories of nuclear energy were that of the Springfield Nuclear Power Plant in the TV Show "The Simpsons".

I'm not saying that our Canadian nuclear power plants, specifically Pickering, can be compared to that of a cartoon show, but the humour surrounding the power plant and the show stuck with me as there were some exaggerated truths to the fictional power plant in Springfield that always left me somewhat wary.

My first real scare with respect to nuclear energy was Japan in 2011. For obvious reasons, this alarmed me. The death, illness, and destruction, immediate, and that which we will see as a result of the nuclear disaster in the future, and also the fear that this could potentially happen in Canada, left me feeling

extremely unsettled.

My second scare was hearing on a local news station of a potential radioactive leak close to Nimes in the south of France while my parents were vacationing there later in 2011. Since then, I have done some research and have spoken to my mother, who is active in a local awareness group and I feel I can no longer sit idle.

I am the mother of two small children, and I live in between Pickering Nuclear Power Plant and Darlington Nuclear Power Plant, which I note was not indicated as a selling feature on the MLS listing when my husband and I purchased our home. You can laugh at that. Frankly, I don't have time to be doing this.

I'm a working professional who tries to juggle the balance of raising my 4-year-old and my soon to be 2-year old while working, playing on sports teams, keeping a clean home, at times, taking my kids to lessons on nights I don't play baseball, and my husband works late hours downtown. He plays sports, you get the gist. I really have better things to spend my precious time doing.

However, I really don't feel like I have a choice in the matter. Something needs to be done about this and it's important for my voice to be heard.

In my spare time, which you can see, is few and far between, I read the extensive reports from CELA,

which is Canadian Environmental Law Association, about the inadequate emergency planning by OPG in the event of a major nuclear accident, and I'm worried. It is apparent that no real plan exists for a large-scale nuclear accident, and it's really a matter of time before something detrimental happens if Pickering Nuclear Power Plant keeps on going.

Pickering is Canada's oldest nuclear station and has the esteemed distinction -- sarcasm intended -- in the world of having the highest population density surrounding it.

Pushing the old Pickering B reactors beyond their designed life makes no sense.

For the sake of those of us who live close to Pickering and for the sake of Canadians and beyond, please deny OPG the request for a five-year licence.

Rather, I ask that a temporary licence be given with the mandate to prepare for the closure of the Pickering plant by the end of 2014.

Decommissioning also needs to be addressed. With Pickering slated to be shut down by 2020, the plant needs to be cleaned up and over 25,000 tonnes of high-level radioactive waste secured as safely as possible. Handling this improperly creates more risks for citizens. On-site bunkering for long-term storage is the best

option.

I recently told a girlfriend of mine, who does not have children, and I was writing this letter and making this submission, and she understood my concerns and then voiced the opinion she does not know if she ever wants to have kids in the state of the world.

That really resonated with me, and I realized to ensure for a happy, healthy future for my children and their children, I need to stand up for my beliefs, speak out against the five-year licence, which could be deadly and destructive for everything living near and far from Pickering.

I'm not a scientist, an engineer or a physicist, but I have common sense and it's apparent that the five-year licence cannot be renewed.

Thank you for the opportunity to voice my concerns. In the words of Homer, not the Homer with the surname Simpson, I quote the poet from "L'Iliade":

"Once harm has been done, even a fool understands it."

Let that not be the case and please let's do something about this before it's too late.

Thanks for your time.

**THE CHAIRMAN:** Thank you.

Questions?

Ms. Velshi?

**MEMBER VELSHI:** I have a question for staff. We've had a number of intervenors make the comment that Pickering has the esteemed distinction in the world of having the highest population density surrounding it. Is that correct?

**DR. RZENTKOWSKI:** I'm not sure if one can categorize Pickering as the one having the highest Population density because if one traveled over to Europe, one would see power plants very close to major cities as well.

I don't want to compare the population between the cities, but I want to only say that in Europe, many reactors are sited very close to large -- largely populated cities.

**THE CHAIRMAN:** Anybody else?

You weren't here to -- were you here to hear the EMO presentation?

Okay, so again, they made a whole presentation on emergency management.

And on site bunkering, you think that's the best solution, to keep the waste onsite?

**MS. JAKUBIEC:** Alexis Jakubiec, for the record.

As you can see, I'm not -- technically, I

don't know as much as -- I serve more from a moral standpoint. But from what I've researched and from what my mother has told me, I do think that's the best option, for sure.

**THE CHAIRMAN:** Okay, we'll leave it at that.

Thank you. Thank you very much.

**MR. LEBLANC:** If I may, I'd also like to remind people who missed part of the proceedings that they are being video webcast and that you can review everything that's been said during the day at your leisure in the next three months from the webcast, and that presentation was early on this morning.

**THE CHAIRMAN:** Okay, moving on, the next submission is described in CMD 13-H2.44, and it's by the Regional Municipality of Durham. And I understand that Ms. Reid will make the presentation.

Go ahead please.

**13-H2.44**

**Oral presentation by the  
Regional Municipality of Durham**

**MS. REID:** Good evening, Members of the Commission. For the record, I am Pauline Reid, Director

of Corporate Policy and Strategic Initiatives for the Region of Durham.

I'm here today to present Durham region's oral submission on the relicensing of Pickering Nuclear Generating Station.

The Chief Administrative Officer, Mr. Cubitt, who would normally make the presentation, is away on regional business. With me are Warren Leonard and Dan Millette from the Durham Emergency Management Office.

By way of context, we operate within what is known as a two-tier system of local government. The Regional Municipality of Durham is the upper tier of local government and within the region are eight lower tier local municipalities, including the City of Pickering. Therefore, both the region and Pickering are host municipalities.

The region is responsible for providing a wide range of services including water supply and distribution, sewage collection and treatment, police services, ambulance, emergency management, transit, major arterial roads and bridges, waste, social services, public health, economic development, and regional planning.

As a host community, Durham Region has a substantial interest in the continued safe operation of the Pickering Nuclear Generating Station. This station is

a major employer in the region, providing highly skilled, well paid jobs for our residents.

Ontario Power Generation has a history of active citizen engagement and corporate sponsorship of community projects in Pickering and beyond. This plant has also helped support Ontario's economy and development by providing a substantial portion of the province's electricity for several decades.

As other intervenors have indicated, Durham Region has also enjoyed continued dialogue with OPG. They provide regular updates to Regional Council on their operations. This ensures that councillors are kept well apprised of OPG activities and initiatives. We are confident that OPG operates its Pickering nuclear facility safely.

In addition, OPG demonstrates its commitment to community involvement and environmental stewardship by participating actively on our Durham Region roundtable on climate change.

It is the position of the Regional Council that it strongly supports the five-year renewal of licence for the Pickering Nuclear Generating Station.

And thank you for the opportunity to present to you.

**THE CHAIRMAN:** Thank you.



Questions? Anybody?

Well, let me ask you the same thing I asked the Mayor of Pickering. In the regional meetings, do -- you know, safety issues associated with Pickering, emergency planning, evacuation, all of those issues, do they come to the table for discussion?

**MS. REID:** Not that I can recall.

**THE CHAIRMAN:** So post-Fukushima, things like this, there was no further angst expressed by the community, citizens?

**MS. REID:** I believe that Emergency Management office received a few calls and perhaps they could elaborate on that.

**MR. LEONARD:** For the record, Warren Leonard.

It's my understanding that some calls were received by the office, but they were mostly asking questions about where they could get their KI pills.

**THE CHAIRMAN:** Okay. Thank you.

Thank you for the intervention.

The next submission is by the Friends of the Farewell and Black Creeks, as outlined in CMD 13-H2.52 and 2.52A. I understand that Ms. Racansky will make the presentation.

13-H2.52 / 13-H2.52A

**Oral presentation by the  
Friends of the Farewell and  
Black Creeks**

**MS. RACANSKY:** I'm just waiting for my overhead.

Good evening. We are here to represent Friends of the Farewell. My name is Libby Racansky, science teacher.

**MR. RACANSKY:** And my name is Stan Racansky, professional engineer, former reactor maintenance engineer at Bruce A and Darlington.

**MS. RACANSKI:** Questions and comments 1 to 3 are based on displayed documentation.

One: PNGS B pressure tubes are now 30 years old. They were to be replaced this year. Will they operate another seven years?

Normal life expectancy of zirconium alloy is 25 full power operating years.

Creep induced by radiation makes these tubes brittle and unreliable. There are also calandria tubes sagging about six inches in 25 years. How long will they last?

Two: DNGS is in planning stage for

refurbishment, replacement of pressure tubes, calandria tubes and feeder pipes. This refurbishment will start in 2016 or 24 years after entering service in 1992.

How can one rely on fault tree analysis and believe that the same components at PNGS B most impacted by radiation, heat and pressure will last many years longer, past their design life?

Three: as reactor ages, maintenance, repair and replacement of individual parts become more difficult, more technically challenging, more frequent and ultimately more expensive.

Those are facts proven by past experiences. Question related but more serious is: is extending operation of reactors past design life also more risky?

Was the factor of location of these reactors in close proximity to large population centres considered as well?

And we have one more source -- new source but our content of presentation remains the same.

**MR. RACANSKY:** Questions and concerns 4 to 6 are based on comments by Mark Elliott, OPG Chief Nuclear Engineer, that missed some basic point from the *Star* article "Pickering nuclear seeks to renew its licence", by John Spears, May 27<sup>th</sup>, 2013. The article is attached.

There are many good reasons why CANDU

nuclear plant has operating design limit 25 years, or 210,000 operating hours. After that, the plant should undergo major refurbishment, like replacing fuel channels and primary heat transfer components, or plant is to be shut down.

Refurbishment cost, based on recent Bruce Power refurbishment of Unit 1 and 2, reached \$3.4 billion and it took three years of lost revenue. Simply, it is very costly operation.

But statements like "There is nothing new here" or "Pickering pressure tubes, when installed, were 6.4 metres long and they will grow by 15 centimetres by 2020; they will perform safely", these are a bit rhetoric.

Not really. When pressure tubes is installed and fuelled, basic loads are approximately 1,000 pounds of fuel and heavy water, 500 pounds of axial compression force from bellows at the end of channel, heavy water temperature between 250 and 300 Celsius, heat transport pressure 1,500 psi, and radiation.

After 25 years of operation, a pressure tube reactor core grows by 150 millimetres, or 6 inches. It also sags and is not straight anymore. It may sag by as much as 6 inches, as one may see at fuel channel mock-up at AECL Sheridan Park.

While basic load remains the same, question

mark, compression force increases by 2,000 pounds every time creep of pressure tube changes by 25 millimetres, or by 1 inch.

After 25 years, creep of pressure tube reaches 6 inches, meaning axial force of bellows is now 12,000 pounds.

Since the pressure tube is not straight anymore, part of the axial force acts as additional load added to base load. This means creep curvature is not linear in the second stage of creep. There are additional loads, both lateral and axial.

During the same time, or 25 years, creep or distortion of crystal structure continues and makes pressure tube material weaker and more susceptible to break.

Other negative factor is that fuel bundle, normally supported by three bands of wear pads, after 25 years is supported by only two bands. The central band is useless. Straight fuel bundle will not follow curvature of bent pressure tube. That leads to higher wear of pressure tube in contact points.

Replacement of pressure tube after 25 years is not possible. One cannot insert straight pressure tube into sausage-like bent calandria tube unless it is pre-bent as well.

There are no tools, no suitable replacements parts and no known procedure to do such work, as per AECL personnel statement in 2005.

If any core pressure tube breaks, scenario more possible as time goes, the whole channel would have to be replaced. Result of such replacement is not economical. Inserting straight components between sagged components would not satisfy requirements of thermal neutron required distances for fission reaction, or 11 and a quarter inch.

Instead of natural uranium fuel, it may be filled with iron blocks and never refuelled.

Conclusion: after 25 years of operation, the state of the basic reactor components, like pressure tubes, calandria tubes and feeder pipes, is not the same as when installed.

Most of negative factors are getting worse and there is a question. What is the straw that breaks camel's back?

Public safety Fault Tree Analysis.

"...fault tree analysis proved that the PNGS reactor operation beyond design limits is safe."

That was the statement of OPG and accepted by CNSC.

Unfortunately, the statement did not disclose any parameters, conditions or assumptions made when this analysis was done. Fact is, vacuum building or the last barrier is tested every five years and deemed to be sound.

Safety systems like shutdown system 1, shutdown system 2 and emergency coolant injection systems are tested and assumed to be safe.

All of these assumptions lead to an Achilles Heel problem; weakened pressure tube that stands at the bottom of any fault tree analysis, components level, whether it is reactor safety, nuclear safety or public safety.

If any pressure tube in one reactor breaks and fuel is spilled, there are systems to take care of such accident.

If more than one tube breaks and dissipated heat, approximately 3.4 kilowatts of heat per bundle, has to be removed and pressure tube in the reactor building rises, there is vacuum building that will take care of it.

The question is: with all the weakened and overstressed pressure tubes in all reactors, will the vacuum building take care of another unit break?

If not, and it is unlikely but not impossible scenario, did the fault tree analysis use such

assumptions?

**MS. RACANSKY:** Question 7, in respect of Risk of Accidents and Emergency Management and Evacuation Plan, is based on displayed documentation.

"On May 2<sup>nd</sup>, 2013, I was on my way to Durham Regional Headquarters in Whitby for the morning meeting on Clarington Transformer Station. Usually, this route using local and regional roads, approximately 16 kilometres long, takes me about 20 to 25 minutes, depending on traffic.

At that day, there was accident at the Highway 401 close to Brock Street.

All traffic from Highway 401 was diverted to local and regional roads. The traffic was terrible that day. We were mostly standing still or moving half a kilometre or less in one minute.

This time, the route took me one hour and 10 minutes."

Can you imagine, in case of nuclear emergency, how effective a current Evacuation Plan would be if all cars in this densely populated area within 5 to



10 kilometres radius from PNGS would use local and regional roads?

In conclusion, we would like to hear reply to these questions.

One: based on our concerns and concerns of other individuals and groups on extended licence renewal of PNGS, will the Commission approve the licence for operating this old plant?

Would it not be more suitable to grant a temporary licence while the OPG would be asked to prepare plans for longer term shutdown and decommissioning of the PNGS instead?

Two: on the basis of my example of traffic problem in Durham caused by accident, shouldn't the Commission require the OPG to prepare a better and more realistic Evacuation Plan in order to protect the public and also to ease the public fear and mistrust in this plan?

Thank you for allowing us to speak and bring forward many unsure and unanswered questions and concerns. Will they be clarified to us today, please?

**THE CHAIRMAN:** Thank you.

Who wants to go first? First of all, let me ask, were you here throughout the whole day when -- so you didn't hear the EMO presentation on traffic management

and all that, and you didn't hear about ageing tubes? You didn't hear that. Okay.

Well, it's the same issue we're going to have all the time. Maybe just to give courtesy to the intervenor, somebody should at least deal with the pressure tube. I think there's a lot of comments that were made about the irreparability of those things.

So maybe we can start with OPG and staff.

**MR. JAGER:** I'll ask Mark Elliott to comment on the pressure tubes.

**MR. ELLIOTT:** Good evening. Mark Elliott, Chief Nuclear Engineer, for the record.

Yeah, I'd like to have a chance to talk about some of these issues. The pressure tubes -- to be able to say what we've said this morning, that the pressure tubes will not exceed their -- any design limits by 2020, that took a lot of work.

We started a fuel channel life management project in 2009 and we had industry partners along with us, but just to give you kind of the size of it, it was -- OPG's share was about \$40 million of research.

And the way it was organized, there was 18 research reports and each one involved experiments or modelling. I talked about burst tests at the Chalk River Nuclear Labs, so this was extensive research that we went

-- we did, and in each case, we submitted a report to the CNSC experts.

The CNSC experts had a chance to look at it, gave comments, and so we've completed all of that work and it's only by doing that work that we can say that all of the issues around pressure tubes have been dealt with and we expect the pressure tubes to not exceed any design limits by 2020.

And one of the things I haven't said yet is that we check along the way as well. We're not just saying that we're good to 2020. Every single outage -- and we're on a two-year outage cycle, we'll go in and inspect these pressure tubes and we'll make sure that all of our predictions are true and that we aren't approaching any design limit, so we'll continue to do that right to 2020; right to the last outage.

One technical thing that I'm sure the intervenors will be interested on the creep that was mentioned is what we do to handle the growing or the creep of the pressure tube is we lock the pressure tube at one end and let it creep free the other end, so not to get those axial stresses.

And then, as it grows, we then -- midway through the life, we unlock one end and lock the other end and let it grow back the other way. And what that does is

it maintains the pressure tube solidly on bearings for the life of the pressure tube.

So that's just one example of how we handled some of the ageing that's going on, but overall, it's only by the research that I've talked about that we can make those statements.

**THE CHAIRMAN:** Staff, anything to add?

**DR. RZENTKOWSKI:** Yes, Greg Rzentkowski, for the record.

Earlier today, I had a chance to explain that the end of assumed design life is not an indication of a cliff edge effect, meaning the reactor is safe today, but it will be unsafe tomorrow.

And now I would like Mr. Gerry Frappier to describe what we are doing to extend the current safety case and ensure safe and reliable operation of the units.

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

So I think first of all we should talk a little bit about this 210,000 hours or 25-30 years. It's important to note that is, I would call, a business number if you like.

So the original -- when the original designs were being put together, the business side of the house said, "We want a reactor that would last about 30

years" and the designers then took about an 80 percent capacity rate for 30 years; gives you 210,000 effective hours full power.

So that's not like a carton of milk, let's say, that there's something going on inside that is going to make it no good after that time period.

What this was, this was an engineering target, a design target that it was important to make sure that all the systems could handle that; that it could last for that length of time.

So the designers took that as a target and ensured that all the different pieces, including the pressure tubes on that would last at least that long. And as Dr. Rzentkowski just said, they did that with a lot of conservatism, so it's not like the day after or the -- an extra few hours is going to make a big difference.

There was lots of conservatism and we are not talking about pipes that are at the point of bursting at that point. We're talking about pipes that meet all their requirements, all the design requirements.

Now, what we've been doing, as OPG has just mentioned, over the last few years, is doing an awful lot of research to project out the design analysis, the design reviews and our knowledge of the degradation mechanisms so that we would be able to be sure that the pressure tubes

and all the other components, for that matter, are going to last beyond the 210,000 hours or -- and again, the target that's been set is 247,000 hours.

So again, the engineering is going to be done such to make sure that there's lots of conservatism to be getting to there.

It's very important to realize that throughout all this time, the key is not how many hours is going on; it's does the tubes, the strength of the material and that still meet all the design requirements.

And we will be ensuring -- CNSC will be ensuring that the design requirements are always met, the safety margins are always there. If the research shows that it can't, then we would not be allowing it. In this case, we're fully confident that we can proceed beyond the 210,000 hours.

So I just -- I think, as we were just saying, I think it's very important for people to understand that we don't have a bunch of pipes that we're worried are going to burst anytime now. That is not what we're talking about at all.

What we're talking about is we have good solid analysis for a certain period of time and we are extending that analysis beyond there.

**THE CHAIRMAN:** Thank you.

Over to you, any comments about that?

**MR. RACANSKY:** I would say an aside.

**THE CHAIRMAN:** Okay.

**MR. RACANSKY:** But as reactor engineer originally, I'm always concerned because pressure tube is Achilles Heel of any reactor.

I'm aware of the fact that IMS is doing inspections regularly every outage. I know that every time pressure tube is taken out, it goes to AECL, that a number of tests are done. But nevertheless, additional five years is additional five years of operating. And with continuous creep, I'd like to be sure that we are safe.

**THE CHAIRMAN:** Okay.

**MR. RACANSKY:** That's my concern.

**THE CHAIRMAN:** Thank you.

**MR. RACANSKY:** Thank you.

**THE CHAIRMAN:** Thank you very much for the submission.

I'd like to move on to an ---

**MR. LEBLANC:** Can I ---

**THE CHAIRMAN:** Sorry.

**MR. LEBLANC:** We just were wondering if Mr. Randy Luster, who is scheduled for the next presentation is in the room.

We don't think he is. So in this context his presentation will be considered as a written submission and be addressed when we do the written submissions.

So this will allow us to go to the next presentation, Mr. President.

**THE CHAIRMAN:** Okay. Okay, you're keeping track of all of this; right?

**MR. LEBLANC:** Yes, I am.

**THE CHAIRMAN:** Good.

So the next submission is by the Provincial Council of Women of Ontario, as outlined in CMD 13-H2.36 and 2.36A, and I understand that Ms. Janes will be joining us by ---

**MR. LEBLANC:** Teleconference.

**THE CHAIRMAN:** --- teleconference.

**MR. LEBLANC:** But I'm not sure we've reached her yet.

**MS. JANES:** It's through; I'm here.

**MR. LEBLANC:** Oh, good.

**THE CHAIRMAN:** Can you hear us?

**MS. JANES:** I'm here, yes, and it's ---

**THE CHAIRMAN:** Okay.

**MS. JANES:** --- just one call, I waited.

**THE CHAIRMAN:** You're on. Please proceed.



13-H2.36 / 13-H2.36A

Oral presentation by the  
Ontario Council of Women  
of Ontario

**MS. JANES:** Yes, for the record, my name is Gracia Janes and I'm the Vice-President of Environment for the Provincial Council of Women of Ontario and I am presenting their position as backed by the National Council of Women of Canada. I'm speaking from Saskatchewan so I'm hoping that you can hear me clearly on my cellphone or whatever.

**MR. LEBLANC:** Very well, thank you.

**MS. JANES:** Can you hear me?

**MR. LEBLANC:** Yes, very well.

**MS. JANES:** Okay, yes.

We are asking the Canadian Nuclear Safety Commission to use its power under the *Canadian Nuclear Safety and Control Act* to refuse the life extension, to bring an order to protect the public and the environment from unreasonable risks caused by the operation of these ageing and troubled reactors which up until this application was presented were considered to be at the end of their operational lifespan or the end of 2014.

To make our case, we will deal with the huge risks to millions of people and the economy in this part of Ontario should there be, as the Chair has put it, the doomsday or more fearful event, the location of the Pickering station directly above an active fault line which exhibits persistent seismic activity and the excellent counterinterviews to those of CNSC staff regarding the potential dangers.

And then the findings, very briefly, of the Federal Ministry of Environment 30 years ago, the 1994 ASES report, and the 2009 Ontario Drinking Water Advisory Committee Report regarding the dangers to public health from tritium releases and the need for stricter standards versus the contrary views of the CNSC staff.

Our most significant concern with the life extension of these reactors is the possibility of a single or a multiple reactor meltdown caused by an earthquake, malevolent act, human error or other at this ageing and troubled plant.

Many others have expressed similar concerns and we know that the Darlington hearing of December 2<sup>nd</sup> to 6<sup>th</sup>, CNSC Members and the Chair had some doubts about those accidents and some precautionary advice to staff as the Chair said:

"...the dilemma we always have here is

because it's such a low-probability event that everyone is ignoring it; yet for the citizen, even though it's a low-probability event, that's the most fearful event, so we've got to bridge these two conflicting issues; low, low frequency, but maybe high impact. You've got to deal with it in all your brochures. That would be, in my view, make sure that all the citizens and committee are aware -- community are aware of what to do with an emergency plan. Chair Binder, Chair, and I don't know how to say your name. Is it Binter, or Binder, Chair?"

Anyways, I'll just say "Chair Binder".

**THE CHAIRMAN:** I respond to both.

**MS. GRACIA:** Coming to the licensing in 2014, we'll need to forget about this "one in a million". What we need is a case of a doomsday scenario.

The Chair has referenced to a brochure refers to one that was previously circulated which didn't even mention a nuclear accident.

In this Pickering application, it is

interesting to note that at the Darlington hearing on December 3<sup>rd</sup> staff said that all the necessary warning measures were finally in place for the three-kilometre containment area and that the ten-kilometre area had yet to be dealt with.

No mention is made of the possibility of strong winds, system failures, winter weather that there could be chaos although Member McDill raised issues like grid and communication failures and potential traffic chaos.

We would add: Where would all the people be housed and for how long? How will businesses stand commercial losses over perhaps nine days or more? What about the loss of farm crops?

Now, regarding the *Nuclear Liability Act* which was raised earlier, while the OPG carries the liability of up to 75 million -- and this should be far higher than much and lengthy discussed 750 million proposal -- this is just the tip of the iceberg should there be a doomsday scenario.

Not only are the people of Ontario ultimately paying for this but we will suffer huge interrelated and cumulative costs from the interference with industry and commerce as well as environmental health and social impact.

There are also staff barriers to the potential nuclear turndown by this Commission. Considerable barriers.

Any independent observer or reader of the December 2012 Darlington hearing transcript would understand the Provincial Council of Women's considerable concern if CNSC staff is failing to take the most precautionary approach.

This is particularly important given the extremely serious nature of the current Pickering Nuclear life extension proposal should things go awry.

Given that CNSC's mandate is to protect the public, it would seem that the staff should act in the public's interest by taking the most precautionary stance possible, exploring every option, listening to outside independent witnesses and working with them and the public. Instead, while the CNSC commissioners and the Chair ask important questions during these hearings, the staff always seems to be on the side of the nuclear projects and on the offensive towards differing views.

An example, an excellent example of this attitude and lack of due attention to other scientific views was exhibited in a response to questions of geology and what they call a "stable seismic area" near and under Darlington and Pickering.

On December 4<sup>th</sup>, 2012 PCWO noted some contrary views of experts in this field. These experts included J. Robert Janes, a retired geologist, who studied at the University of Toronto under Tuzo Wilson, the expert on Plate tectonic, taught at Brock University and has written many of the text books for all ages including "*Rocks, Minerals and Fossils*" for elementary school and one other "*Geology in the New Global Tectonics*" for high school and "*Air photo interpretation*" for university as well as the "*Great Canadian Outback*" for the public.

The other expert was Dr. Mahaajer who did a ten-year study of the area around Pickering. He earlier critiqued the work of Federal Natural Resource Canada one-day study in a 2003 article which has been used by CNSC and others to undermine the Dr. Mahaajer's earlier warnings about earthquakes.

I cite now the 2003 article by Dr. Mahaajer and N. Eyles which clearly shows the lack of depth of the studies relied upon by CNSC staff and the nuclear community. The article states that:

"Pickering Nuclear Generating site was constructed adjacent to a major population centre now more than 5 million people and in the late 1960's largely in ignorance of local and

regional geologic conditions and well before plate tectonic paradigm provided a model for basement evolution. The presence and significance of natural bedrock lineaments such lineaments as the Central Metasedimentary Belt Boundary Zone that passes directly under Pickering Nuclear Generating Station together with several other structures that intersect below Pickering was not then known. Today, such structures are recognized as being defined by persistent earthquake activity. The local community has every right to be concerned about the presence of an ageing nuclear reactor in their midst."

The article goes on to say that:

"Unfortunately, Godin et al,..."

and he's the fellow who did the background geology for OPG:

"... missed much -- misses much of the current literature on this subject and their interpretations are not in

accord with the current  
understanding."

He also noted that in that study of 1938 information and even a Latvian paper in Latvia.

Another area where the staff differ with the wide variety of expert opinion that should be paid attention to is that of standards for tritium releases to water. It is PCWO's view that in responding to presentations at the Darlington hearing regarding the need for stronger standards and release into water that staff clearly reflected the nuclear industry viewpoint.

Now, you have put our brief -- you've had our brief for about a month and I, from what I've listened to today you feel you have heard enough about this issue.

However, there are two thoughts that come to mind and questions that I would ask the Commission to consider. These are: No.1, since CNSC staff say the nuclear plants are meeting and sometimes they have been doing better on average than the lower precautionary California, European and the ASIS and the Ontario Drinking Water Advisory Committee Recommendation standards, or in some cases guidelines, what is their problem with advising governments and advising Health Canada and advising just about anybody else that they -- that these are -- it's a good idea to follow these higher standards.



Not to do so clearly indicates interest in the nuclear industry rather than public health.

Are CNSC staff feeling that they know better than everyone else except Health Canada and the international regulatory body? Both of whom I believe they advise or a part of.

Our conclusion is: PCWO draws attention to the CNSC staff report regarding Pickering life extension with theirs and OPG's proposed safety improvement. Again there is the usual go ahead and just a cautionary note regarding the build-up of black deposits from Unit 1 which CNSC is monitoring very closely to resolve this issue and has imposed a 3 percent reduction on full power to preserve the safety margins and so there is a better understanding of the cause and effects of the deposits.

While this latter action is meant to be reassuring, it is also a disturbing indication of staff determination to press forward regardless of the signals and their avoidance of using the precautionary principle to avoid undue risk to the public when making recommendations.

With Pickering -- excuse me, trying to do this on a screen, sorry, can't get it. I'm losing it. I'm afraid my computer has gone to the very beginning. I'll just have to get back to where I am. Sorry, there we

are. Okay.

While this latter action is meant to be reassuring, it is also a disturbing indication of their determination to ignore this, our warning.

With Pickering, even the average person would see this is like dealing with an old car, where the brakes are giving out, the tires are on their last tread, the transmission is faltering and the body is rusting through in places. One is courting disaster: In this case, the worst case scenario of a nuclear meltdown.

And we draw your attention at this point to the -- and I'm sure you are quite aware of it, yeah, I think you've heard from the people who were dealing with the difficulties at Chalk River, at the lab there, and the very, very close call with -- due to a human error.

Therefore, we request that the Commission use its power under the *Nuclear Safety and Control Act* to refuse this application for the extension in order to better protect the public and the environment from further unreasonable risks due to the continued operation of this ageing and troubled plant located in the urban heartland of Southern Ontario next to Lake Ontario and close to many people, millions of people on both sides of the border and over an active geologic fault.

Thank you.

**THE CHAIRMAN:** Thank you.

Comments?

Mr. Tolgyesi.

**MEMBER TOLGYESI:** The intervenor was talking about seismicity.

Do we have still NRCan personnel on the phone or present?

**THE CHAIRMAN:** Dr. Adam, are you on with us?

**DR. ADAMS:** Yes, I am. Am I coming through clearly?

**THE CHAIRMAN:** We can hear you, so maybe, I don't know if you heard the intervention.

**DR. ADAMS:** I did.

**THE CHAIRMAN:** Would you like to take -- would you like to comment on what was said?

**DR. ADAMS:** I would.

For the record my name is Dr. John Adams, National Resources Canada and I am a Seismologist with Natural Resources Canada.

The question was about seismicity around the Pickering site. We have to know that earthquake (audio problems) ... two kilometres. In a Canada-wide context, the Pickering/Toronto area has ---

**THE CHAIRMAN:** Sorry, Dr. Adams, sorry to

interrupt. If you are on a hand-free, I suggest you pick it up because you are very garbled.

**DR. ADAMS:** Okay.

Is this better?

**THE CHAIRMAN:** Much better.

**DR. ADAMS:** Okay.

(Audio problems) So ... fault ... typically more than a couple of kilometres deep. In a Canada-wide context, the Pickering/Toronto area had quite low seismicity activity.

It's lower than Ottawa or Montreal, for example, but higher than Winnipeg. And we see contemporary earthquakes chiefly under the western part of Lake Ontario and Niagara Peninsula and adjacent New York State.

However, the rate is relatively low. Typically we see one magnitude three or larger earthquake in a six-year period. That's an earthquake which is strongest to be mildly felt.

The largest historical earthquake was in -- Attica, New York State, 1929. It was a Magnitude 4.9 and did cause chimneys to be thrown down in New York State but was mild in Toronto.

In terms of the seismicity, what we have to do is extrapolate that rate of seismicity in Western Lake

Ontario to a longer period of time. And the best estimate is that it would be about one Magnitude 6 or larger earthquake in a 3,000-year period.

There's a very large uncertainty on that. The rate could be as high as 1 in 500 years or it could be much rarer. And one wouldn't want to focus particularly on the more common end of that because it could be much rarer. And those earthquakes could be anywhere in the -- in that box. It could be 150 kilometres south of there for example. So that's the state of the seismicity.

The intervenor also talked quite a lot about the faults nearby and I feel that the intervention has really given that Chapter 3 of a book which is -- it has a conclusion beyond Chapter 3.

The initial report of faults near Pickering were Rouge River faults in 1992. I was the leader of a report from the Geological Survey of Canada on that in 1993 but take it there was some doubt of that interpretation.

Subsequently, around 1999 or 2000, two things happened; the Ontario Power Generation drilled through the (inaudible) fault and -- and Godin, who was the university researcher, independent of the government, led a study to look at the deformation of the fault.

The -- and Godin published a paper, the

drilling from OPG showed fairly conclusively that the faults that were reported were caused by glacial shove from above and not from an earthquake from below.

Mohajer et al. wrote a discussion of that which was widely quoted in the intervention but there is also a response from Godin to that discussion which I think really, really soundly dismisses a lot of the concerns from Eyles and Mohajer.

**THE CHAIRMAN:** Dr. Adam ---

**DR. ADAMS:** That's the summary to that.

**THE CHAIRMAN:** Okay. Sorry, I'm not sure we caught all of it. There were some technical connection here.

So maybe some staff who are familiar with the work that Dr. Adams done, maybe can give us a little summary about this?

**DR. THOMPSON:** If I could? Mike Rinker has some notes from Dr. Adams. Perhaps he can summarize what Dr. Adams has just presented?

**THE CHAIRMAN:** Go ahead, please.

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

I'd like to state first of all that CNSC works together with the Geological Survey of Canada, as well as with our U.S. counterparts who are in the process of revising their seismic hazard mapping.

So, we do a lot of collaboration with the experts in this field and we do not get our information from industry. So we're not aligning with an industry perspective. We're aligning with the experts in the field both in Canada and the United States.

In general, around the Pickering area there are faults in this area, it's not a surprise. It's an old continent and there's historic ancient activity and there's some remnant scars that exist. And the geologic processes that have occurred in ancient times have left these scars.

However there is no tectonic activity now that would cause extreme seismic events of the magnitude that is seen say at continental margins or what has happened in Japan.

Surrounding Lake Ontario there are no known active faults that would cause this sort of activity. The feature that is identified underneath Pickering is likely not a fault.

It is a remnant of glacial activity. It could be a push feature where glaciers move forward, they move back. So they move a lot of rubble and rock material in a line called the liniment and that is identified from surface as a potential -- it has the same sort of line feature that a fault could have. But in this case,

through some investigation, it's likely a glacial feature and not a fault underneath Pickering.

So to -- in summary, there -- the way we can't predict if a fault would ever be -- that one fault would be active and not another, but we can base predictions on the earthquake budget of a certain region, and history has shown that the -- that there is no active faults within the region that would cause the sort of magnitude that would cause any concerns.

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

Monsieur Tolgyesi? C'est tout? Okay.

**MS. GARCIA:** Might I respond?

**THE CHAIRMAN:** Go ahead.

**MS. JANES:** Yes, I guess the intervenor there did -- has not read the previous brief that I gave in Darlington.

And for Dr. Adams, think I -- I'm not sure he's read my current one or if he has he certainly hasn't read the original one. I did really condense it completely when I presented so he would have to go back to the original.

But it is the opinion of Dr. Mohajer and -- and Gaines (ph) who have considerable expertise, that there is persistent -- it's the persistence and the repetity -- the repetition of the small scale seismicity



around the end of Lake Ontario that is the problem.

And also the -- there is a real concern that the history that is being used only goes back 180 years at the most, rather than a long, long time, thousands and thousands of years.

You have to look at the overall picture and I just feel that they haven't -- they're telling the same story over and over. And with Dr. Adams I have to, with due respect, indicate -- if he did the first study it was pointed out by the -- our expert that he was -- that the people that went out did a very, very fast study, very, very short, to respond.

And they were doing it for one of the nuclear organizations. I think it was Ontario Power Generation but it might have been CNSC. I'm not sure because I don't have my original in front of me.

And also that the second study, that he had then cited that I had already just said, this was a study that was critiqued because it did not have current information.

It was -- it didn't even have the information coming from studies that had been done for waste management -- waste management groups around the province in the late nineties.

So -- and it was using 1936 data and

lacking data, so it really -- it really wasn't a great study. So, for us to -- for us to say that CNSC experts are right is really difficult, if not impossible, because you have two good geologists who are saying exactly the reverse.

**THE CHAIRMAN:** You want to say something about this staff or Dr. Adams, even though we still -- not sure we can hear you coherently.

**DR. ADAMS:** Dr. John Adams, for the record.

It's true that we didn't spend very long in the 1993 study but drilling was (inaudible) evidence there. And there is -- there is no doubt in my mind and I think no doubt in (inaudible) of experts, deformation of the Rouge River fault did come by glacial shove from above.

The second point that was raised was that -- how do you take a 180 year long history and (inaudible) the rate of earthquakes that may happen only every 1,000 or 10,000 years.

And the answer is statistical models. Not just the rate of the earthquakes that we used but the area over which they happen. And what we were really interested in checking with a combination of magnitude (inaudible).

In addition, the uncertainty which we

recognize in slides should be taken into account. So we end up with an estimate, together with its uncertainty which is effectively an extrapolation of that 180 year record. That's the least (inaudible) number to have and without it we wouldn't be able to (inaudible).

Thank you.

**THE CHAIRMAN:** Okay. We'll have to leave it at this. And maybe -- maybe we should -- staff should follow-up with Dr. Adams and the intervenor and look at those two studies and see if there's any kind of major differences and if it can be explained, reconciled or mitigated.

Anybody else, any other question to the intervenor?

Sorry? Who is this?

It's me?

**( LAUGHTER/RIRES )**

**THE CHAIRMAN:** I'm causing this noise? You're now really causing some technical issues here.

Okay who else? Anybody?

Dr. McDill, please?

**MEMBER MCDILL:** Thank you.

With respect to the intervenor's comments on evacuation times.

I'm not sure if EMO is still here.

And the comment that it may be -- this is page 3 -- five to nine hours to evacuate the three-kilometre area, et cetera.

In terms of emergency planning, this morning, I think, reference was made to 18 hours for potassium iodide.

Can we try and pull those two topics together for the intervenor, please?

**DR. RZENTKOWSKI:** Absolutely.

So that means in the absolutely worst-case scenario we can imagine, it will be 18 hours before we will have any releases from the plant, and this will be filtered through emergency equipment which is currently in place and, nevertheless, there will be some releases to the environment; this is after 18 hours.

So that means in emergency planning, if you recall the presentation from this morning, emergency activation will be made after two hours into the accident. So that means there will be approximately 16 hours to put all measures in place and start evacuation of people, if necessary.

Does that answer your question?

**MEMBER McDILL:** Can you go a little further with roads and transport?

We're getting people point at people.

**DR. RZENTKOWKI:** Okay, we would gladly do that, and I will ask Raoul Awad to respond to this question.

**MR. AWAD:** Raoul Awad, for the record.

EMO and the Ministry of Transport were the joint centre of traffic. They have the ability to make orderly evacuate the area within the time prescribed under the provincial plan.

I think we have -- we still have EMO in -- OPG. I think OPG already ordered a study for time of evacuation; they can give us some detail about it.

**MR. JAGER:** Glenn Jager, for the record. We can ask Jim Coles to respond to that issue.

**MR. COLES:** Good evening.

Jim Coles; I'm the Director of Emergency Management and Fire Protection for OPG.

There's a few points that I'd like to touch on with regards to evacuation and evacuation time estimates as referred to there.

As mentioned earlier this morning by Emergency Management Ontario, detailed plans are in place to evacuate the 10-kilometre primary zone, and the processes, procedures and infrastructure are in place to expand evacuations beyond 10 kilometres as possible.

One of the key points as well is that evacuations would be completed long before venting occurs. That is the goal.

In 2008, OPG commissioned a study to look specifically at evacuation time estimates and modelling. Evacuation time estimates were calculated using population, employment and road network data for 2006, and data for -- sorry, 2025 was used for projections, looking forward to the future. That information was provided by provincial and local governments.

Results showed that effective evacuations can be accomplished under the harshest weather conditions, any day of the week, and substantially in advance of the 24 hours provided. Evacuation time estimates out to 10 kilometres range from 4½ to 6.3 hours, based on 2006 data, and looking ahead, using population data estimates for 2025, that time increases to 9 hours.

The results in the modelling used incorporate human nature. People don't always work in the community. Sometimes they're working in Toronto, they come home, collect their belongings, their family members, and then evacuate. All that was built into the modelling.

And one other aspect that I'm sure will come up tomorrow is shadow evacuations, and that's the concept that people outside the zone that has been asked

to evacuate, those additional people will also evacuate -- those are the shadow evacuation populations.

The modelling that OPG utilized here incorporated 30 percent of that population would be involved in a shadow evacuation, which compares to some of the modelling estimates accommodated -- and south of the border, but they base their estimates on a 20 percent shadow evacuation. So we had additional conservatisms built in as well.

**THE CHAIRMAN:** Okay.

Anybody else?

I just have one quick question to the intervenor. On page 5, I'd like to ask staff, where does that come from?

If you look at one, two, three -- the fourth paragraph, last sentence:

"CNSC plan to ship highly radioactive liquid waste containing highly-enriched uranium to South Carolina, which just got the go-ahead."

**MR. AWAD:** Raoul Awad, for the record.

We didn't receive any request from Chalk River to ship any -- to make any shipment of highly-enriched uranium in liquid form.

We still -- actually, Chalk River still is

in feasibility study phase, to design the container to ship this shipment.

**THE CHAIRMAN:** So, Ms. Janes, where did you get the idea that that was approved?

**MS. JANES:** Well, at some point -- at some point, whether the -- the piece of information came past my desk, because I've been gone for quite a while, that indeed there was -- this was going to happen.

It may have been a ministerial, sort of, faux pas, that they were dealing with that it would happen and it would definitely happen again.

And it's good to know that we're looking into the containers, but given the track record -- well, I'm always ever hopeful that this won't happen, because it will be the first time these kinds of things will be going over the roads; they're going over the river, the St. Lawrence River, at some point; they're going through communities and we just haven't seen this before. We've had some more dangerous stuff fly into Chalk River from across the border, but we haven't had this kind of -- well, it will be necessary to have, I'm sure, armed people along the way; we haven't had that. So that's part of the -- what I've been following, and that's my only reference.

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

You have any final words?



**MS. JANES:** Yes, I do.

I just wanted to let Dr. Adams know I did read, I did read the whole of Dr. Mahaajer's article, and some of the background related to the kinds of issues that were found there, and I suppose he'll stand by his position that -- rather than Dr. Adams in his position.

Also, as far as the evacuation goes, the result is very similar to the assumptions that are made about the risks that we take with our health which are just assumptions, and I go with the Chair's idea that one needs to look at the worst-case scenario, and I'm hoping that that's what all of our groups that are looking after safety and well-being are doing.

Because if you had something happen, such as what could have happened at Chalk River recently, a meltdown, you really have to look at the worst-case scenario. You can't just presume that everybody's going to get out in that length of time, or that this many people will move that way, and it is -- and it's such a significant thing that it needs a lot of discussion.

I'm very pleased that the Chair has suggested that -- Dr. Thompson and Dr. Adams look more closely at the seismicity and the -- because I have the other background from the last brief about the number and the increasing number and increasing intensity, and that's

really important.

And I'm hoping that you would involve -- they could involve Dr. Mohaajer as well in their discussion.

So my last words are: I don't think the Commission has anything to lose. This plant is due to close, and it will take quite a while to get it, you know, taken down and such, and deal with the waste that's there, and the parts, et cetera, but you have nothing to lose.

Ontario doesn't need the power at this point. They've had a dwindling demand over the last few years. I've presented to the Energy Board. I know some of the background to this. I've seen the two plants; I've seen the constant downhill side of demand. There's a lot of energy conservation that's going on, and alternative energy, et cetera.

And so -- and the province themselves, are now revisiting thoughts about the Darlington newbuild. I think it's really important that the lives and the livelihoods of millions of people are considered and I'm hoping that you will look very closely at this particular application; it's unlike any of the others. This plant has been closed and I would really ask you let it have its natural life and let it finish.

Thank you.

**THE CHAIRMAN:** Thank you.

I'd like to move to the next submission by Rolls-Royce Civil Nuclear Canada Limited, as outlined in CMD 13-H2.66 and 2.66A. And I understand that Dr. Alexander will make this presentation.

Please proceed.

**13-H2.66 / 13-H2.66A**

**Oral presentation by**

**Rolls-Royce Civil Nuclear**

**Canada Limited**

**DR. ALEXANDER:** Good evening. My name is Neil Alexander; I am the General Manager of Rolls-Royce Civil Nuclear Canada, as such, I'm an industry mogul in the likes of Mr. Burns that we're all familiar with.

I will, during my presentation, make some very self-serving comments about the benefits of Pickering to the nuclear industry in Canada. And I expect you to discount them.

More importantly the way I would define myself is as the father of three surviving children, Charlie 13, Emma 4, and Sam 2. I love them very much and one of the reasons that I come to events like this is that I am concerned that we make our future plans for energy

generation in this province based on fact rather than magical tricks.

The principle of a magical trick is that you draw all of your attention over to your right hand here and then slip in comments about what's happening in your left hand without allowing people to pay any attention to them. And I think that's a very dangerous way to make plans for the future.

I want to draw attention to some of the consequences of not providing an ongoing licence to the Pickering generating station.

And curiously enough they're based on the same sort of arguments that the people that have been arguing that their licence shouldn't be provided have used.

So first of all we start with safety where clearly the statistics show that nuclear power generation is one of the safest ways of generating electricity. If you look at hydro, one of the most dangerous ways of generating electricity, particularly large dams statistically causing substantial damage. Even smaller dams still create the risk of people drowning as water levels change in rivers downstream of the dams.

Coal, I think we're all aware has challenges throughout, all the way through the mining of

coal that is a particularly dangerous activity through to the burning of it in the stations.

And gas has similar challenges, it being a very explosive material. Even windmills kill people at a rate an order of magnitude greater than the nuclear industry. And if you include for the people who fall off the roofs of their houses while trying to put solar panels on their roofs, that becomes one of the more dangerous forms of electricity generation as well.

So I am not a safety expert and I don't have a huge number of statistics for you this evening. But what I ask of the CNSC is that when it considers the licensing of the nuclear stations it considers not just the consequence of providing the licence but the consequences to people's health as a result of not providing that licence.

And I think in that light you will find it an easier decision to decide that it is an appropriate way to move forward.

Similar arguments can be made about the environment. On the one hand we have heard lots of issues demonstrated in our right hand about some of the challenges that the nuclear industry has.

But there will have been very little comments about the alternative if Pickering was not

generating electricity in this province.

It is, I think, everybody will understand laughable to believe that the green technologies of wind and solar would be able to produce the kind of electricity that we need when we need it that is produced by the Pickering nuclear station.

If we decide not to move forward with the continued operation of Pickering that power does have to be produced somewhere. The alternative way that that power will be produced is with gas.

The greatest environmental threat that this planet faces today is that of climate change.

Climate change, we believe, is driven by the increasing levels of carbon dioxide in our atmosphere. The increasing levels in carbon dioxide in our atmosphere we believe is being created by mankind's burning of fossil fuels. Gas is a fossil fuel.

Closing Pickering will put this province in a position where it is actually increasing its levels of carbon dioxide production. Directly the opposite of what the rest of the world would like us to achieve.

So there again, I am not an environmental specialist and I don't have vast numbers of statistics for you, but I ask you in considering the future licensing of Pickering that we consider the consequences to the

environment of not continuing the Pickering licence.

And again, I think we'll find that the real dangers arise from not extending that licence.

Finally, and this is where I come to the self-serving comments, we've heard a lot about the jobs that can be created by other technologies. And in doing so, people forget about the jobs that are actually created by the nuclear industry.

I'm here representing Rolls-Royce Civil Nuclear Canada. About three years ago Rolls-Royce invested in Ontario by buying a company that had been here for some time, entirely focussed on the nuclear industry. In doing so it invested a large sum of money in the Province of Ontario.

That company continues to employ about 85 people. Many of those are graduates, others are very experienced and skilled trades people.

As well as doing that it has been acting as a magnet for talent from elsewhere in the Rolls-Royce group to move into the area. Those people, when they enter Ontario, they bring the money with them that they had earned in other countries and then they continue to benefit the Province of Ontario, locally, provincially and in fact Canada in general through payment of taxes and through the purchases that they make in the province.

This is hugely valuable.

On top of that, the 85 people that we employ directly we employ a vast number of additional people in the Province of Ontario through the sub-contracts that we place with other organizations, and it goes on.

But I think most powerfully one of the benefits that we have had in working with Ontario Power Generation at stations, such as the Pickering station, is the benefit of developing technology and knowhow that we've then been able to use to place ourselves on an international scale and become custom equipment suppliers to the rest of the world.

We currently have some significant projects with the United States that are a direct results of the experiences that we have had in working with the Canadian nuclear industry.

So again, I'm not an expert on economics or job creation, but I ask the Commission to consider when it is considering an ongoing licence for Pickering, not just the consequences of providing the licence but the losses that we would have if we do not continue with the Pickering station.

So I just want to say don't get me wrong, I do enjoy a magic act, I just don't think that we should be



planning the future for our children based on that magic.

Thank you very much.

**THE CHAIRMAN:** Thank you.

Question, comment?

Monsieur Harvey.

**MEMBER HARVEY:** Maybe we could just repeat, it has been said two or three times today that the Commission is not involved with the economic part of the project.

The Commission -- the mandate of the Commission is specifically to assure that the project will be safe and secure and would protect people, health and environment.

So the main part of your presentation was on the economic side of it. So this is my comment. I don't know if you have something to say about that. But this is why we are here.

**DR. ALEXANDER:** I understand that and I think the arguments for the safety have already been put in place. And I felt it was appropriate just to add in the other benefits that are arising and people should be aware of.

**THE CHAIRMAN:** I -- just to -- no, go ahead, Mr. Tolgyesi.

**MEMBER TOLGYESI:** Are you living in the

Pickering-Darlington area?

**DR. ALEXANDER:** I pass through the Pickering-Darlington area. I'm in the rather peculiar circumstance of living in Oakville and working in Peterborough.

So I'm very familiar and spend a lot of my time in close proximity to both Darlington and Pickering plants.

**MEMBER TOLGYESI:** My question was if you're living here what's your perception -- how -- what's your feeling about the population what they consider -- but if you are not anymore -- were you living here before?

No? No, you are never living here before?

**DR. ALEXANDER:** I have never lived in this region, no.

**MEMBER TOLGYESI:** My question is that as a citizen of Pickering, you know, I thought you were living here.

**DR. ALEXANDER:** Right.

I am aware that as you approach nuclear plants, the popularity of those plants tends to increase, whereas as as you approach many other forms of electricity generation the popularity of that mechanism decreases. And that is, I think, particularly true of the windmills that we see proliferating at the moment.

And I think that's an indication of the fact that the benefits of having a nuclear plant in your community accrue to the community, whereas many other forms of electricity generation, the benefits accrue elsewhere.

**THE CHAIRMAN:** Anything else?

You intrigued me in one of your observations. Maybe I should ask staff or anybody who has an answer; how does safety numbers or accidents associated with, you know, with gas, coal, nuclear, wind and solar?

You never hear about a number of people falling off the roof; I never thought about it as a safety kind of an issue here, but is it really true, there's a significant number?

Is anybody collecting stats on this? Do they exist? Anybody knows that?

**DR. ALEXANDER:** So the numbers do exist. I don't have them with me, but there are a number of papers that have been produced where they analyse the number of fatalities for a kilowatt produced of various different types of power generation.

There's also very good data available on the World Nuclear Association Web site on major incidents, and the -- related to power generation.

**THE CHAIRMAN:** I saw them for coal.

**DR. ALEXANDER:** They clearly provide the context.

**THE CHAIRMAN:** I saw them for coal. I saw them for coal, I never saw them for wind and solar. So -- unless I ---

**DR. ALEXANDER:** So it's not in the major incidents, because they tend to be minor ones. They're smaller ones but more frequent.

**THE CHAIRMAN:** Right.

Okay, thank you. Thank you for the intervention.

**MR. TULETT:** Martin Tulett, for the record, for OPG.

So there is a health study done recently by the World Health Organization on lives saved by the nuclear power industry compared to alternate forms of generation.

And I don't have the study in front of me, but I believe the conservative estimate is 1.8 million lives that have been saved by use of nuclear power over other forms of generation.

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

Marc, is anybody ---

**MR. LEBLANC:** No, I think we should do some written ---

**THE CHAIRMAN:** Unless there is anybody that's supposed to appear in front of us tomorrow who is available now?

I guess not.

So what do you want to do, do you want to do some written ---

**MR. LEBLANC:** I think we should do some written.

**THE CHAIRMAN:** Okay. Go ahead. Let's set up.

**MR. LEBLANC:** If the Members want to get their binders of written submissions, and OPG, and staff.

So as is our usual practice, I will go through individually to each of the written submission and I will be asking the Members if they have any questions for staff or for OPG.

So the first submission, which is in CMD 13-H2.4, is a written submission from Edward Moeck.

**13-H2.4**

**Written submission from**

**Edward Moeck**

**MR. LEBLANC:** The next submission is from the Whitby Chamber of Commerce at 13-H2.5.

**13-H2.5**

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

**MR. LEBLANC:** The next written submission is from the Durham Nuclear Health Committee, 13-H2.6.

**13-H2.6**

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

**THE CHAIRMAN:** I was just curious as to -- this is from Dr. Kyle, who did not want to make an oral presentation.

Any -- I thought that would be a good forum for him to appear and give the -- kind of the health status of the community.

So anybody knows why not?

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

We did exchange some emails with Dr. Kyle and Mary Ann Patriciak. The sense that I have is that they did present the results of the Durham Health studies in December to the Commission, and since there was no new

work I think they felt that their written submission was appropriate.

We have been exchanging information on, for example, our health study and some of the work that they have been involved in.

**THE CHAIRMAN:** Just remind me, were the studies that they did published?

**DR. THOMPSON:** Patsy Thompson.

If I could, I could get back to you tomorrow. I'll send him an email.

I'm not sure they were published in the open scientific literature. The reports are available on their Web site, but I'll confirm tomorrow.

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

**MR. LEBLANC:** The next submission is from Black & McDonald Limited at 13-H2.7.

**13-H2.7**

**Written submission from  
Black & McDonald Limited**

**THE CHAIRMAN:** An issue which we have not talked about, and I don't know if this person was talking about, this is the last paragraph, about quality -- safety and quality performance and quality assurance.

Did we -- when you replace components in your facilities how do you assure that they are the real material and not fraudulent components?

**MR. JAGER:** Glenn Jager, for the record.

We have approved supplier lists, a quality control program, as well as we audit approved suppliers.

And there are, of course, our own internal quality records that attracts the custody of the material all the way from receipt inspection right through to its final use within the power plant, and we can readily retrieve all that documentation.

I'll ask Martin Tulett to comment a little further on how we qualify vendors and ensure that the pedigree of parts is appropriate and there is no, as you say, fraudulent suppliers.

**MR. TULETT:** Martin Tulett, for the record.

So OPG does carry a list of about 500 qualified nuclear suppliers. That supplier community is well aware of the fraudulent parts issue and we put the onus on the suppliers to make sure that fraudulent parts are not supplied to the power plant.

There is actually a working group within those suppliers that talks on a regular basis about fraudulent parts and how to detect it. And they've got the processes they follow, basically, to make sure that



they're not buying from questionable sources.

**THE CHAIRMAN:** Are you concerned, you know, the Korean had a major issue ---

**MR. TULETT:** Absolutely, that's major issue.

**THE CHAIRMAN:** The Americans, with the integrated circuit also, not only in nuclear. In ---

**MR. TULETT:** Yeah.

**THE CHAIRMAN:** --- many other industries.

**MR. TULETT:** No, absolutely. We were aware of that and we have not seen any fraudulent parts issues in the plants. We have seen some issues with quality control, particularly when suppliers change factories, you know, they go to off seas supplier. They're still qualified but their -- they lose sight of their quality control.

We do monitor vendor performance and we track every issue on parts that are -- that don't perform to standard and we personally interview the suppliers about what happened and follow-up with them, make sure they have appropriate corrective actions.

**THE CHAIRMAN:** Thank you.

Marc?

**MR. LEBLANC:** Submission 13-H2.10 is from Andrew Hill.

Any comments?

13-H2.10

Written submission from  
Andrew Hill

**MR. LEBLANC:** The next submission, H2.13 is  
from Ann E. Short.

13-H2.13

Written submission from  
Ann E. Short

**MR. LEBLANC:** No comments?

You have a question?

**MEMBER TOLGYESI:** The question is addressed  
to the staff; the request is that the Commission mandate  
the OPG publish in all major Ontario newspaper, et cetera,  
et cetera.

What is the practice and why -- how does it  
work when -- is there any obligation to publish in the  
Toronto area, for example, if it's Pickering or Darlington  
and ...

Could you just give some indication of  
that?

**DR. RZENTKOWSKI:** Greg Rzentkowski, for the record.

There is a formal disclosure protocol in place and this protocol, actually stems from the regulatory requirement which is now a part of the licence condition.

So, yes, the licensees are obligated to disclose all events at the site or something what potentially could be of public interest. So, something of public interest, of course, may eventually end up in the newspapers.

**MEMBER HARVEY:** I think -- the special items or -- when you have to apply for a license, for example, what is the current practice?

**DR. RZENTKOWSKI:** Current practice is only for the CNSC to make a formal announcement on the external Web site. I am not quite sure what is the role of OPG in informing local population. We should probably ask OPG.

**MEMBER HARVEY:** Okay.

OPG, can you comment?

**MR. JAGER:** Glenn Jager, for the record.

There is an extensive communication that's completed as part of the relicensing process and outreached to community organizations and are broadly advertised. The application for relicensing -- I'll ask

Kevin Powers to speak in more detail about the communications that we have performed in support of the relicensing effort.

**MR. POWERS:** Kevin Powers, for the record.

OPG, over the past five weeks, has undertaken a number of activities around the relicensing hearing and the publication of the relicensing hearing that has included newspaper ads in all of the local papers, it has included Internet ads.

It has included outdoor ads in all of the Go Train stations in the area, as well as the local transit shelters. We have mentioned it in all of our community meetings, we have put out a special newsletter to all of the residents in Pickering advertising the -- advertising the hearing as well.

**MEMBER HARVEY:** In the Toronto area, I mean, outside of the immediate area here?

**MR. POWERS:** Kevin Powers, for the record.

The Internet advertising that we undertook would reach people in the Toronto area.

**MEMBER HARVEY:** That's the only mean, the Internet? I mean, you're not publishing in papers?

**MR. POWERS:** That's correct.

**THE CHAIRMAN:** Marc, you want to --

(inaudible)

**DR. RZENTKOWSKI:** ... specialist is here in the room. So, Marc Drolet will ...

**MR. JAMMAL:** Ramzi Jammal, for the record. It's -- it's -- the request, Monsieur Harvey, as pertaining to the hearings, we'll ask ---

**MR. LEBLANC:** I'll be happy to answer this. So, we publish notices in the local newspapers and in some instances, we will also publish in the wider Toronto area.

I -- perhaps, my colleague Marc Drolet has the information as to in which newspapers we did publish this time around, but I recall, for Darlington, we had published in the *Toronto Star*, the *Peterborough Examiner*, and a number of other newspapers and I would think we would have probably done the same in this (inaudible)

We've also, for all people who have intervened in our proceedings, they're automatically put on a subscribers list and will receive all notifications directly through email distribution and there's 2700 such persons that are subscribers, including all intervenors that have participated in our processes in the last three years.

So, perhaps for first-time participants, they were not on the list, but now they will receive it and they will determine whether they want to remove

themselves from the list, but we have done positive subscriptions.

**THE CHAIRMAN:** Marc, you want to add and describe how many newspaper are that list?

**MR. DROLET:** Yes. I believe there's -- Marc Drolet, Senior Communications.

I just want to confirm that we did publish an ad in the *Toronto Star* in September. We also did a Web banner on an Aboriginal news network and we also used social media.

We have a YouTube -- not a YouTube, but a Facebook account. We also did some publicity around the participants funding programs that was connected to Day-2 of the proceedings.

And for the number of media, I believe it's around 80 representatives of different media outlets across the country, including many from the Toronto and the Durham area, in particular.

**THE CHAIRMAN:** Okay. Thank you.

Ms Velshi?

**MEMBER VELSHI:** And I know there's no one here from EMO, or I believe Durham (EMO). So, perhaps OPG can try answering this.

We've heard a number of times of the public being wilfully ill-informed about Emergency Evacuation

Plans or the Emergency Plan overall. In your public outreach or any public opinions surveys that you do, do you have a test for that to see how well-informed they are about the Emergency Plans or Evacuations Plans, in particular?

**MR. JAGER:** Again, I'll ask Kevin Powers to answer that question. Glenn Jager, for the record.

**MR. POWERS:** Kevin Powers, for the record.

We have not undertaken any studies to that effect over the past couple of years.

**MEMBER VELSHI:** Thank you.

**THE CHAIRMAN:** Mr. Tolgyesi?

**MEMBER TOLGYESI:** In this H2-10, intervenors are talking about concerns of some -- the major manufacturers as to their components suitability for long-term use.

So, that means the manufacturer doesn't trust his product. That's what I understand.

Do you have any control or, you know, quality control or long-term guarantees or whatever?

**MR. JAGER:** Glenn Jager, for the record.

All the suppliers supply components to a technical specification. They have a quality program that they are required to adhere to.

We do audit those components. Components

are graded as to a quality level depending on their application and, finally, when the components arrive, they're receipt-inspected, and then used in their final application.

The components are expected to meet their technical specification which would include durability, expected life span, and so forth.

I'll ask Carl Daniel to just briefly respond on how we specify replacement components and their mission.

**MR. DANIEL:** Carl Daniel, for the record.

Components are specified essentially based on their application, whether they're pressure boundary, whether they're -- what their significance level is.

We have a number of ways of doing that. We can specify anything from a direct replacement, which is an identical component to a near identical component to a design change.

The other piece is, as Mr. Jager described, is a whole series of checks and balances that are done. There's one more that's done which is when a component is installed, we either do a post-installation testing or we do checks and commissioning of that material to make sure that it's correct.

So we have a specification process that



goes through an engineering process and we go over a robust purchasing process, and beyond that we have a post-maintenance test or a commissioning program that ensures that it operates the way it's intended.

**MR. SANTINI:** May be if I could extend a little bit on the Quality Assurance Programs.

The suppliers must comply with the same standards, in this case it's CSA N-286 and I would like Kathleen Heppell-Masys to expand on this line.

**MS. HEPPELL-MASYS:** Good evening. My name is Kathleen Heppell-Masys. I'm the Director General of the Safety Management Directorate at the CNSC.

OPG has done a very good job at explaining the fundamentals behind the quality assurance for the components.

In the first comments that were brought on a previous intervention, it was mentioned that there are procurements committee and the one in particular that I'd like to refer to is the Procurement Audit Committee for CANDUs. It's called CANPAK. And so -- or there's another one also that's Nuclear Procurement Issues Committee.

So those committees basically, they would -- just a moment here -- so OPG would primarily rely on them to audit their supplier and they're basically a supply organization set up by the utilities to audit the

suppliers and share the audit's conclusions among its member.

In the event that other members would not want to inspect a particular supplier, they would themselves audit this agency.

Now, CNSC staff has actually observed and continued to observe the audits carried out by CANPAK and NUPIC joint with CANPAK, and I just wanted to add that we're satisfied with their audits from our observations.

**THE CHAIRMAN:** Okay. Thank you.

Marc?

**MR. LEBLANC:** The next submission is 13-H2.14 from Dorian Douma.

**13-H2.14**

**Written submission from  
Dorian Douma**

**MR. LEBLANC:** The next submission 13-H2.15 is from the Big Brothers Big Sisters of Ajax-Pickering.

**13-H2.15**

**Written submission from  
Big Brothers Big Sisters of  
Ajax-Pickering**

**MR. LEBLANC:** The next submission is 13-H2.16 from Marilyn McKim.

**13-H2.16**

**Written submission from  
Marilyn McKim**

**MR. LEBLANC:** The next submission is H2.17 from Kylie Brooks.

**13-H2.17**

**Written submission from  
Kylie Brooks**

**MR. LEBLANC:** The next submission is 13-H2.18 from Hydro Pensioners of Ontario, Georgian Bay District Pensioners Association and the Bruce Sub Group.

**13-H2.18**

**Written submission from  
Hydro Pensioners of Ontario,  
Georgian Bay District Pensioners  
Association, Bruce Sub Group**

**MR. LEBLANC:** The next submission is H2.19  
from Maria Kasstan.

**13-H2.19**

**Written submission from  
Maria Kasstan**

**MR. LEBLANC:** The next submission is from  
Environmental Earth Angels, H2.20

**13-H2.20**

**Written submission from  
Environmental Earth Angels**

**MR. LEBLANC:** The next submission is from  
the Town of Ajax, 13-H2.21

**13-H2.21**

**Written submission from the  
Town of Ajax**

**MR. LEBLANC:** The next submission is from  
the Ajax and Pickering Rotary Club, H2.22.

**13-H2.22**

Written submission from the  
Ajax and Pickering Rotary Club

MR. LEBLANC: The next written submission  
is from the Durham College, H2.23.

13-H2.23

Written submission from the  
Durham College

MR. LEBLANC: Written submission H2.24 is  
from Marsh Instrumentation Ltd.

13-H2.24

Written submission from  
Marsh Instrumentation Ltd.

MR. LEBLANC: The next submission is from  
Brenda Thompson, H2.27.

13-H2.27

Written submission from  
Brenda Thompson

MR. LEBLANC: Submission H2.28 is from

Veridian Connections.

**13-H2.28**

**Written submission from  
Veridian Connections**

**MR. LEBLANC:** Submission H2.30 is from  
Norma Dickinson.

**13-H2.30**

**Written submission from  
Norma Dickinson**

**MEMBER VELSHI:** I have a question.

**MR. LEBLANC:** Madam Velshi?

**MEMBER VELSHI:** Question for staff.

One of the concerns the intervenor raises  
is spokespersons in the event of emergencies, credible  
spokespersons.

Do you folks want to comment on that and is  
anything that the CNSC is doing about that?

**MR. JAMMAL:** Ramzi Jammal, for the record.

As our communication expert, Mr. Drolet, is  
coming up, the CNSC, based on the Fukushima review and the  
External Advisory Committee that was struck by the

President that recommended to have a proper communication in place, and the CNSC has two things.

Number one is the capacity of an individual to be non-technical. It was made very, very clear in order to communicate in layperson's language on what's happening.

And the CNSC has established what we call a crisis Web site that is all ready to be activated in the case of emergency and to transmit the information.

Mr. Drolet is -- I'll pass it on to Mr. Drolet.

**MR. DROLET:** And quickly if I can add, Marc Drolet, CNSC Communications, if I can add two points quickly.

We've also put some efforts into creating more plain language material, especially to explain how a reactor works and about the safety systems in particular, to be able to provide some information if people were looking for some, especially in the case of a potential incident.

And another thing about the -- in response to your question would be media training. So we've got a schedule to, I guess, beef up or complement the number of people who have media training in the organization and who would be able to be in front of a camera or answer

questions from journalists.

**MEMBER VELSHI:** In addition to CNSC staff, have you reached out to folks who -- say outside the industry, who, you know, the public probably would see with greater credibility, whether they're academics or whoever else to be part of your speaker's bureau, so to speak, in the event of an emergency?

**MR. DROLET:** We did. And I'm having a little blank with one of the -- we have a list of technical specialists from outside the CNSC who we could contact. We also got a relationship with an organization; I'm having a blank right now but could come back with the name of the organization.

Thank you.

**MR. JAMIESON:** Terry Jamieson, for the record. I'm the Vice-President of the Technical Support Branch.

I'd like to assure you that all communications coming from the federal and provincial levels and from the municipal levels are spelled out in the various tiers of documentation and emergency planning.

So at the federal level in the Federal Emergency Response Plan, there are points of contact and primary spokesmen that are designated. And typically they are credible individuals with scientific backgrounds that



can speak in plain language. During Fukushima, for instance, we used Dr. Paul Gully from the Public Health Agency of Canada.

**THE CHAIRMAN:** Can I follow up with OPG? Do you have -- in case of a serious accident, do you have a communication designated person that can deal with the media which is -- remember it's now 24/7, all the time and they will talk to anybody on anything?

**MR. JAGER:** Glenn Jager, for the record.

Yes, we do have a media response and I'll ask Kevin Powers to describe that.

**MR. POWERS:** Kevin Powers, for the record.

We do have a 24-hour a day media line. And in the event of an emergency, we do have accredited spokespeople at the locations of our nuclear plants as well as at headquarters to deal with media in Toronto.

**MR. JAGER:** Glenn Jager, for the record.

What I would add is for -- within our event response and our procedures, that includes notification to public affairs staff so that they can modify -- mobilize the necessary support from Public Affairs and arrange speakers to communicate with the public.

As well, they have a fan-out notification to notify stakeholders of any event or occurrence and it's that network that initiates that. And, as well, we have a

fairly robust in-house pool of experts that can speak to specific issues that may arise.

**THE CHAIRMAN:** Thank you.

Mr. Tolgyesi.

**MEMBER TOLGYESI:** I have two questions, Mr. Chairman.

One is in page one on the third paragraph, second line. Intervenor is talking about Chernobyl as this site is still contaminated and one million that have been attributed to date.

Could you comment on that?

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

There's been a lot of studies done by international organizations on the outcome of the Chernobyl accident from a health point of view.

And so in terms of mortality, as the intervention says, from the work done by the United Nations Scientific Committee on the Effects of Atomic Ionizing Radiation and Atomic Radiation -- and that's dated 2008 -- there were 134 plant and emergency response staff who suffered from acute radiation syndromes, so acute radiation exposure during the accident.

Of those people, of those 134 people, 28 people died a few weeks after the accident of radiation

exposure and by 2006, an additional 19 people of those 134 had died, but not of radiation-related symptoms.

And so the data that is kicking around with millions of people having died of cancer from Chernobyl, it's not factual information. There were some initial -- initial projections using the linear no-threshold hypotheses and the estimated doses very early after Chernobyl. And these calculations were done for essentially public health planning purposes, and these projections were for very high rates of cancer.

But over time with the studies that have been done, it's been shown that the actual doses to people around Chernobyl during the accident are very much lower than those projections early after the accident. And the estimated cancer risks did not materialize.

There have been thyroid cancer in children -- in people essentially who were exposed during Chernobyl as children, and as teenagers, because during Chernobyl, the safety measures in terms of relocation and iodine -- potassium iodine pills were not given early enough and there was no monitoring of food.

So milk contaminated with radioactive iodine, for example, was consumed several weeks after the accident. And so because of that, there's been some thyroid cancer but certainly nothing of the magnitude that

is given in the intervention.

**THE CHAIRMAN:** Wasn't there an official report from the World Health Organization?

Somehow I remember the number 4,000 or something like that. Is that not correct?

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

It is the UNSCEAR Report 2008, and there's been 5,127 cases of thyroid cancer.

So your memory is pretty good.

**MEMBER TOLGYESI:** And the second one on the next page, one, two, three, fourth paragraph, some of the researchers show that contamination level in Tokyo is worse than the evacuation zone of Chernobyl. And Tokyo is about what, 100 kilometres from Fukushima, or so?

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

That information is not factual. There's actually, this week, the UNSCEAR is actually meeting and most of the week is dedicated towards finalizing the report that is being done on the consequences of the Fukushima accident.

And there's very good information, there's been a lot of quality control on the data used for the assessment of public health and effects on workers, and

the information on levels of contamination in Tokyo are not factual.

**THE CHAIRMAN:** I wouldn't have gone -- I just came from Fukushima in Tokyo, and they wouldn't allow me in if there was this kind of radiation in.

So in Tokyo, it's as clean as in any other place, and even in Fukushima onsite, most of the places are very -- now, low radiation, unless you get really inside, close to the core.

**DR. THOMPSON:** Patsy Thompson.

That's correct, Tokyo is being used for example for monitoring thyroid of children as a reference region.

**THE CHAIRMAN:** Anything else? No.

**MR. LEBLANC:** Submission 13-H2.31 is from the Hydro Pensioners of Ontario, Toronto District.

**13-H2.31**

**Written submission from the  
Hydro Pensioners of Ontario,  
Toronto District**

**MR. LEBLANC:** The next submission is H2.32 from the Miller Group.

13-H2.32

Written submission from  
The Miller Group

**MR. LEBLANC:** The next submission is 13-  
H2.33 from Mary Fish.

13-H2.33

Written submission from  
Mary Fish

**MR. LEBLANC:** The next submission H2.35 is  
from Don and Heather Ross.

13-H2.35

Written submission from  
Don and Heather Ross

**MR. LEBLANC:** The next submission is H2.38  
from Victor Sgro.

13-H2.38

Written submission from  
Victor Sgro

**MR. LEBLANC:** The next submission H2.42 is from Klaus Dohring.

**13-H2.42**

**Written submission from  
Klaus Dohring**

**MR. LEBLANC:** The next submission, 13-H2.43 is from Valerie Fredenburgh.

**13-H2.43**

**Written submission from  
Valerie Fredenburgh**

**MR. LEBLANC:** The next submission, which is H2.45, is from Tania Szablowski.

**13-H2.45**

**Written submission from  
Tania Szablowski**

**MR. LEBLANC:** The next submission, H2.46, is from the Municipality of Clarington.

**13-H2.46**

Written submission from  
Municipality of Clarington

**MR. LEBLANC:** Mr. Tolgyesi?

**MEMBER TOLGYESI:** The Municipality is  
talking about:

"Clarington will also face the  
decommissioning of the Darlington  
Station site at some point."

Could you -- OPG, could you tell us what  
potential effects will be at Clarington compared to  
Darlington?

**MR. JAGER:** Glenn Jager, for the record.

The question is what would be the effects  
of the closure of Pickering on Clarington?

**MEMBER TOLGYESI:** Yes, (off mic) ...at  
Clarington, because this is a Clarington municipality  
submission and they are saying that:

"Clarington will also face the  
decommissioning of the Darlington  
Station site at some point."

**MR. JAGER:** Glenn Jager, for the record.

I'd have to say that we don't have that  
information as yet as to what the total social and  
economic impact would be on the closure of Pickering on



Clarington.

And in fact, we've funded two studies for the Town of Pickering, the City of Pickering to evaluate just that. So it's early yet. Those studies would have to be done to really fully assess what the impact is and we don't have that information at this time.

**THE CHAIRMAN:** I think to follow-up on the next page, on page 2, they really -- it's a general comment that nuclear hosting communities, they're really interested in the re-use of the -- of the land re-use.

So when you decommission, you know, what would you intend for the piece of real estate to be re-useful?

**MR. JAGER:** Glenn Jager, for the record.

Again, we've -- that's very much in a study phase at this point. You heard from one intervenor, the Community Advisory Committee, they've posed the very same question.

So we've just begun studies that are looking at repurposing the site, future use, and the impact on the community.

So that work is underway, has just started. We don't have any results really to share with the Commission at this point, but is part of our overall plan for the site.

**THE CHAIRMAN:** Thank you.

**MR. LEBLANC:** The next submission, H2.47,  
is from Dick O'Connor.

**13-H2.47**

**Written submission from  
Dick O'Connor**

**MR. LEBLANC:** The next submission, H2.48,  
is from Alison Petten.

**13-H2.48**

**Written submission from  
Alison J. Petten**

**MR. LEBLANC:** The next submission, 13-  
H2.49, is from Nicole Corrado.

**13-H2.49**

**Written submission from  
Nicole Corrado**

**MR. LEBLANC:** Madame Velshi?

**MEMBER VELSHI:** The second-last paragraph  
in the intervention talks about CANDUs proposal to ship to

England. Do you know what that may be referring to, staff?

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

I think the intervenor is making reference to the U.K.'s proposal to get rid of plutonium that they have in their facilities and that they have -- looking to purchase CANDU reactors to be sold to England. That's been a very public thing from the CANDU owners group and the CANDU suppliers, that this is something -- this is very, very early stages, there's no agreements or anything like that at this point.

**MR. LEBLANC:** The next submission, 13-H2.50 is from Roger Brunning.

**13-H2.50**

**Written submission from  
Roger Brunning**

**MR. LEBLANC:** The next submission, 13-H2.51 is from David Lean.

**13-H2.51**

**Written submission from  
David Lean**

**MR. LEBLANC:** Monsieur Tolgyesi?

**MEMBER TOLGYESI:** In paragraph, second last paragraph, page 1, the first line:

"The release of radioactive materials including iodine 131 is of concern."

Could you comment that?

**MS. THOMPSON:** Patsy Thompson, for the record.

This is an intervention that Environment Canada are prepared to -- to address, I guess, tomorrow morning when they're back or -- unless -- yeah, they're back there, so they can -- they can speak to -- to this intervention.

But perhaps, while Environment Canada are getting to a microphone, just to -- to clarify that, on a routine operational basis, iodine -- radioactive iodine releases are not an issue.

**MR. KIM:** Duck Kim, for the record. I am the Senior Nuclear Coordinator for Environment Canada.

The question related to iodine 131, I believe, is a health -- Dr. Lean's perspective or position on that is health. So I would defer that to and I think Ms. -- Patsy -- Ms. Thompson has already addressed that.

**MS. THOMPSON:** So -- I'm sorry, Patsy

Thompson for the record, so we'll try again.

Essentially, the -- the position that Dr. Lean is taking is that releases from the Pickering stations would be carried with currents in Lake Ontario towards Toronto and the evidence we have to date from all the monitoring that has been done at drinking water supply plants, for radionuclides that are originating from the Pickering and Darlington, have not shown the levels that are above sort of background for the area.

And so we don't believe that Dr. Lean's concerns are -- are valid in the sense that the discharges from Pickering are so low that, even during periods where current could flow towards Toronto, they would not be a concern for drinking water supply plants.

And there are monitoring results for several years that indicate that.

**MR. KIM:** If -- maybe I could add Environment Canada's -- so if it's about the -- the currents, Dr. Lean mentioned the coastal jet currents that -- that he was concerned would transport contaminants to Toronto, for instance.

From that perspective, Environment Canada is -- we have a position on that. So the coastal jet phenomenon does exist. It has been observed in Lake Ontario and also in the Great Lakes. The direction and

intensity of the flow of these coastal jet currents are dependent on thermodynamic conditions in the lake, wind conditions and Coriolis force which is associated with the rotational rotation of the earth.

So as Ms. Patsy Thompson already mentioned, the coastal -- these currents have -- do have the potential for -- to transport contaminants potentially that suspended in or dissolved in the discharge from Pickering Nuclear Power plant westerly towards Toronto or easterly.

So that westerly direction tends to happen in the warmer month and, in the colder months, it reverses under certain conditions and these contaminants might be transported the opposite direction towards Oshawa and -- and beyond.

And again, as Ms. Patsy Thompson has already mentioned, the levels are -- of these contaminants, for instance, tritium or iodine 131 are very very low.

For instance, even in a spill condition or a spill situation, if there was a spill of tritiated water in March 13<sup>th</sup>, 2011 from the auxiliary irradiated fuel bay of about 73,000 litres of tritiated water and as a result of that, the nearest drinking water intake monitored or detected only about 1 Becquerel per litre increase from

normal levels.

So from 5 to 6 Becquerels per litre which is significantly far below the -- the Canadian water quality guidelines -- sorry, Canadian drinking water guidelines and even below the levels proposed by the Ontario Drinking Water Advisory Committee of 20 Becquerels per litre.

But in terms of non-human biota which Environment Canada is more -- well, we're interested in as well, the undiluted level of tritium in that spilled water, that incident in 2011, the approximate calculated dose to fish would be about .15 milligrays per day in the concentrated, undiluted form, and that -- which is far below the international guidelines for dose -- dose to fish.

So the -- the -- although this -- this current does exist and it does have the potential to -- to transport contaminants potentially to Toronto and elsewhere, it does move in both directions depending on the conditions and -- and based on the data that we are presented with from OPG and -- and also Environment Canada, we're not seeing significant levels that are of concern.

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

**MR. LEBLANC:** The next submission is H2.54

from Michael Cooke.

**13-H2.54**

**Written submission from  
Michael Cooke**

**MR. LEBLANC:** Monsieur Tolgyesi.

**MEMBER TOLGYESI:** I have one -- I have one there. In the second line at the end:

"... it's countless illegal and environmental crimes that occur on a regular basis and they are covered up."

This is also for Environment Canada because if it's environmental crimes and they are talking about not covered by the mainstream media, okay?

Could you -- could you comment on that?  
Could it happen?

**MS. THOMPSON:** Patsy Thompson, for the record.

Certainly, what we can say is that any unplanned releases to -- to the environment either through liquid or -- or air is required to be reported to the CNSC.

There's also a requirement to report it to



the Ontario Spill Action Centre and Environment Canada is also notified on those occasions.

**MEMBER TOLGYESI:** Which means that it's not necessarily because it's not reported by the media, you are not aware or Environment Canada is not aware.

**MS. THOMPSON:** Patsy Thompson, for the record.

We're certainly aware. We assess all the unplanned releases for -- for consequences and also for -- for the reasons why the spills occurred to make sure they don't happen again.

And the Ontario Ministry of the Environment acts as well to look at the consequences of the spills in relation to their legislation.

Perhaps if Duck Kim is still there, he could speak to how the interaction between the Ontario Spill Centre and Environment Canada.

But certainly under the Memorandum of Understanding between the CNSC and Environment Canada, we do notify each other of environmental concerns and spills.

**MR. LEBLANC:** If OPG could comment?

**THE CHAIRMAN:** Please go ahead.

**MR. JAGER:** Glenn Jager, for the record, we report all spills.

All our effluent pathways are monitored and

I'll ask Barb Reiber (ph) to -- to speak in greater detail on that.

**MS. REIBER:** It's Barb Reiber, for the record.

As Mr. Jager said, we -- we report all spill events according to the legislation, as well as any regulatory infractions, according to the regulatory requirements, and in addition, we report our monitoring information annually through the Radiological Environmental Monitoring Report, which is publically available on our Web site.

**THE CHAIRMAN:** Thank you.

Go ahead, please.

**MR. LEBLANC:** The next submission, 13-H2.55, is from Louise Lanteigne.

**13-H2.55**

**Written submission from**

**Louise Lanteigne**

**MR. LEBLANC:** Dr. McDill?

**MEMBER McDILL:** I would just comment that this intervenor, again, raises the issue of mega thrust zones and the Central Metasedimentary CM Fault. So we may need a little bit more on that again tomorrow that we can

hear a little better, perhaps.

**THE CHAIRMAN:** Sorry, I can't hear you.

**MEMBER MCDILL:** My apologies.

This intervenor also raises the issue of the Central Metasedimentary Fault, and we may need a little more on that again tomorrow when we can perhaps hear that better.

**DR. THOMPSON:** If I could propose, we'll work with the -- Dr. John Adams tomorrow, and perhaps, towards the end of the day, come back in front of the Commission and give an explanation that people can hear.

**THE CHAIRMAN:** I'm looking for -- I don't know if you can go down the slides, they're not numbered or are they? I cannot see the numbers. They're not numbered.

There is a slide here:

"A Parliamentary review found elevated cancer rate of children in Pickering and Ajax."

This is in ACB Study in 1991.

And the next slide after that is:

"Nuclear workers have 3.2 excess death than public."

It's toward the end of the presentation.

**MR. LEBLANC:** While they're looking, we may

be losing our satellite link at 10, so I just want to say to people on our webcast; we are continuing only with written submissions and will resume tomorrow morning at 8:30 with the oral submissions.

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

I do have more detailed information on this somewhere in my notes. The study was done and reported in 1991. Actually, the information in the report -- the report doesn't say what the intervenor says the report says.

Essentially, the report concluded that taking into account a variation within the province that there was no statistically significant difference between cancer rates around Pickering and Darlington with the provincial average.

But if you give me a few minutes I'll give you more detailed information.

**THE CHAIRMAN:** Okay, and you can think also about the next slide, about the -- I thought the nuclear workers.

Okay, go ahead.

**MR. LEBLANC:** The next submission is 13-H2.56 from Colin King.

13-H2.56

Written submission from  
Colin King

**MR. LEBLANC:** The next submission, H2.60,  
is from Kelly Masterson.

13-H2.60

Written submission from  
Kelly Masterson

**MR. LEBLANC:** I may have missed 13-H2.59  
from David and Sheela Lloyd.

13-H2.59

Written submission from  
David and Sheela Lloyd

**MR. LEBLANC:** Jumping over the submission  
from Ms. Masterson, we'll go to 13-H2.62, which is a  
written submission from Friends Indeed - Pakistan Canada,  
Friendship Society of Durham.

13-H2.62

Written submission from

**Friends Indeed - Pakistan  
Canada, Friendship Society  
Of Durham**

**MR. LEBLANC:** The next submission is  
13-H2.65 from the Darlington Nuclear Community Advisory  
Council.

**13-H2.65  
Written submission from the  
Darlington Nuclear Community  
Advisory Council**

**MR. LEBLANC:** The next submission is from  
the Pickering Naturalists, 13-H2.68. And I think we had  
the oral presentation from a member of the Pickering  
Naturalists today.

**13-H2.68  
Written submission from  
the Pickering Naturalists**

**MR. LEBLANC:** The next submission is H2.70  
from the Durham District School Board.

13-H2.70

Written submission from  
the Durham District  
School Board

**MR. LEBLANC:** The next submission is H2.71  
from Aecon Industrial.

13-H2.71

Written submission from  
Aecon Industrial

**MR. LEBLANC:** The next submission, H2.75,  
is from the MP from the Pickering - Scarborough East,  
Corneliu Chisu.

13-H2.75

Written submission from  
Corneliu Chisu, M.P.,  
Pickering - Scarborough East

**MR. LEBLANC:** The next submission is H2.76  
from David Reid.

13-H2.76

Written submission from

David Reid

**MR. LEBLANC:** The next written submission is H2.77 from Joel Dickson, M.P.P., Ajax - Pickering.

13-H2.77

Written submission from

Joe Dickson, M.P.P.,

Ajax - Pickering

**MR. LEBLANC:** The next submission is H2.79 from Barbara Feldman.

13-H2.79

Written submission from

Barbara Feldman

**MR. LEBLANC:** The next written submission is from the Durham Chinese Canadian Culture Centre at 13-H2.80.

13-H2.80

Written submission from

the Durham Chinese Canadian



**Culture Centre**

**MR. LEBLANC:** The next submission is  
13-H2.81 from Babcock & Wilcox Canada Limited.

**13-H2.81**

**Written submission from  
Babcock & Wilcox  
Canada Limited**

**MR. LEBLANC:** The next submission, H2.85,  
is from the Pickering Auxiliary Rescue Association.

**13-H2.85**

**Written submission from the  
Pickering Auxiliary  
Rescue Association**

**MR. LEBLANC:** The next submission,  
13-H2.89, is from the Ontario Federation of Anglers and  
Hunters.

**13-H2.89**

**Written submission from the  
Ontario Federation of Anglers**

**and Hunters**

**MR. LEBLANC:** The next submission is  
13-H2.91 from the Spark Center.

**13-H2.91**

**Written submission from  
Spark Center**

**MR. LEBLANC:** The next submission, H2.92,  
is from the Durham Economic Prosperity Committee.

**13-H2.92**

**Written submission from the  
Durham Economic Prosperity  
Committee**

**MR. LEBLANC:** The next written submission  
is from the Rouge Valley Health System.

**13-H2.95**

**Written submission from  
Rouge Valley Health System**

**MR. LEBLANC:** The next written submission

is 13-H2.96 from the MP for Ajax - Pickering, Chris Alexander.

**13-H2.96**

**Written submission from  
Chris Alexander, M.P.,  
Ajax - Pickering**

**MR. LEBLANC:** The next submission is 13-H2.97 from William and Edith Shore.

**13-H2.97**

**Written submission from  
William and Edith Shore**

**MR. LEBLANC:** The next submission is 13-H2.98 from the Durham Tamil Association.

**13-H2.98**

**Written submission from the  
Durham Tamil Association**

**MR. LEBLANC:** The next written submission is 13-H2.101 from Marie Roulleau.

13-H2.101

Written submission from  
Marie Roulleau

**MR. LEBLANC:** The next submission,  
13-H2.106, is from the Green Party of Ontario.

13-H2.106

Written submission from the  
Green Party of Ontario

**MR. LEBLANC:** The next written submission,  
13-H2.108, is from Linda Hicks and Family.

13-H2.108

Written submission from  
Linda Hicks and Family

**MR. LEBLANC:** The next submission,  
13-H2.110, is from Sue Browning.

13-H2.110

Written submission from  
Sue Browning

**MR. LEBLANC:** The next submission,  
13-H2.112, is from Jutta Splettstoesser.

**13-H2.112**

**Written submission from  
Jutta Splettstoesser**

**MR. LEBLANC:** The next submission is from  
the Durham Catholic District School Board at H2.113.

**13-H2.113**

**Written submission from the  
Durham Catholic District  
School Board**

**MR. LEBLANC:** The next submission is from  
S.M. Richardson at 13-H2.115.

**13-H2.115**

**Written submission from  
S.M. Richardson**

**MR. LEBLANC:** The next submission at H2.116  
is from Sarah Sackville-McLauchlan.

13-H2.116

Written submission from  
Sarah Sackville-McLauchlan

**MR. LEBLANC:** The next submission, at  
H2.117, is from Corina Psarrou-Rae.

13-H2.117

Written submission from  
Corina Psarrou-Rae

**MR. LEBLANC:** The next written submission  
is H2.124 from the Pickering Soccer Club.

13-H2.124

Written submission from the  
Pickering Soccer Club

**MR. LEBLANC:** The next written submission  
at H2.125 is from the Indo-Canadian Cultural Association  
of Durham.

13-H2.125

Written submission from the  
Indo-Canadian Cultural Association

of Durham

**MR. LEBLANC:** Written submission H2.134 is from Steve Dyck.

**13-H2.134**

**Written submission from  
Steve Dyck**

**MR. LEBLANC:** 13-H2.135 is a written submission by Janet McNeill.

**13-H2.135**

**Written submission by  
Janet McNeill**

**MR. LEBLANC:** And if you go back to your oral intervention binders, you'll recall that Randy Luster was not available, or we did not hear back from Randy Luster. So we have transferred the oral presentation into a written submission. That was CMD 13-H2.53.

**13-H2.53**

**Written submission from  
Randy Luster**

**THE CHAIRMAN:** I just need time to find it.

**MR. LEBLANC:** Yes.

**MEMBER HARVEY:** Page 2, top paragraph, the last sentence:

"It must be noted that the incident at the Fukushima plant occurred even with a safer system than in use at Pickering."

Could you comment on that, OPG and staff?

**MR. JAGER:** Glenn Jager, for the record.

I'm sorry, which -- what was the reference?

**MEMBER HARVEY:** It's 13-H2.53, second page, top of the page.

**MR. JAGER:** Okay.

**THE CHAIRMAN:** Give us time to find it.

**MEMBER HARVEY:** That's why I'm trying to bring them to the sentence.

**THE CHAIRMAN:** Do you mind to repeat the question?

**MEMBER HARVEY:** Well, the question is that -- there's the sentence there:

*"It must be noted that the incident at the Fukushima plant occurred even with a safer system than in use at*



*Pickering."*

**MR. ELLIOTT:** I've got it. Mark Elliott, Chief Nuclear Engineer, for the record.

Every reactor design has its strengths. The CANDU reactor, faced with a severe accident, has a number of strengths, as you've seen in the CNSC video that is posted on YouTube, with a large amount of water and different water systems around the reactor.

So at the time of the Fukushima event, that's what we had in place, but since then we've installed portable generators and pumps to make the plant even safer. So a Fukushima-type event is more easily handled and can be handled in a safer manner than it would have been at the time. So CANDU has a safe plant, plus we've added safety to it.

**THE CHAIRMAN:** Mr. Jammal?

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

I believe OPG is trying to be diplomatic on this response.

There is fundamental design differences between the CANDU and the Fukushima. In the CANDU reactor, we start with the use of natural uranium as the combustible fuel, the amount of water itself and the capacity of convection cooling. And the CANDU is -- the

design has two separate shutdown systems.

So to say that the Fukushima plant occurred even with a safer system than in use at Pickering, well, very bluntly, we know it's not true. Different designs exist in place to include from hydrogen mitigations and everything else.

So, collectively, the safety system of the CANDU is adequate. Otherwise, the Commission will never license it.

**THE CHAIRMAN:** I'm surprised you didn't mention the pool, the storage pool. I mean, I still can't believe that somebody designed a nuclear power plant and put the storage pool on the third floor.

**MR. JAMMAL:** Well, that's the other principle. Again, from natural uranium, the capacity of heat dissipation literally, whereas the CANDU fuel in the pool, in the matter of 24 hours dissipates over 95 percent of its energy.

And in addition to it is high enriched uranium and the positioning of the pool up to roughly three to four stories high.

**MR. LEBLANC:** Well, Mr. President, this concludes the list of written submissions.

**THE CHAIRMAN:** What about the One World or One ---

**MR. LEBLANC:** Just One World, they have asked to be rescheduled on Friday. If they can't make it, we'll then consider it as a written submission.

**THE CHAIRMAN:** Dr. Thompson?

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

You had asked that two slides on intervention H2.55 be addressed, the invention by Louise Lanteigne. And so the statement that the 1991 study by the AECC found an increased childhood leukaemia in populations near Pickering and Ajax is incorrect.

In fact, the study says -- the 1991 study by Clarke did find that the estimate of excess childhood leukaemia was higher in some areas, but with the application of the confidence intervals, there was no statistical difference between childhood leukaemia rates in Pickering, Ajax, and any other areas in Ontario close to a major nuclear facility.

And the reference Web site -- the Web site that the intervenor used to prepare her intervention actually states what I have just stated.

The other slide talks about the -- an excess of 3.2 death for nuclear workers compared to the public. We believe this is from the International Agency for Research on Cancer, the 15-country study results. And

the 15-country study, actually when the Canadian data was taken out of the 15-country study, the risks were similar to what has been used to set radiation protection standards. And the CNSC has reanalyzed the Canadian Cohort, making adjustments that -- and corrections, and the reanalysis is available on our Web site.

But, generally, for the 42,000 workers hired by OPG, essentially working at NPPs in Quebec, New Brunswick, Ontario, and AECL workers after 1964, the relative risk due to radiation is actually negative. And so there is no increased risk of cancer due to radiation exposure in those workers. The risks were due -- essentially attributed to early AECL workers, and we're trying to resolve that issue.

**MR. DROLET:** Just to answer Mrs. Velshi's question regarding the network of scientists who we could pull from, the name is the Science Media Centre of Canada.

**THE CHAIRMAN:** Okay. That's it for today. Do you want to remind everybody again? We are back here ---

**MR. LEBLANC:** Tomorrow morning at 8:30.

**THE CHAIRMAN:** Eight-thirty (8:30), and we'll continue having more fun.

Thank you.

--- Upon adjourning at 10:13 p.m.

L'audience est ajournée à 22h13